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Variations of celiac trunk in CT angiography

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ABSTRACT

Background: The celiac trunk is first branch of the abdominal aorta arising at the level of T12 -L1 vertebrae. The celiac trunk trifurcates into the left gastric, common hepatic and splenic arteries. Sometimes the celiac trunk bifurcates into the splenic and hepatic arteries (hepato-splenic trunk) while left gastric artery arises separately from abdominal aorta or remain absent. **Methods:** Abdominal contrast enhanced MDCT scans of 100 patients obtained during the period Jan-May, 2021 were retrospectively reviewed in the Department of Anatomy and Radiology, Subharti Medical College, Meerut and Dr O.P Gupta Imaging Centre Merrut. These patients underwent CECT investigation for various suspected abdominal pathologies. Before injection of contrast written consentis routinely obtained. **Results:** Various types of celiac trunk anatomic variations were identified in our study. Total cases observed 100. Normal three branched celiac trunk giving origin to Left Gastric (LGA), Splenic (SPA) & Common Hepatic (CHA) noted in 91 cases (92.85%) Right hepatic artery direct from CT Right hepatic artery (RHA) emerging directly from CT is rare accounting for 0.4% to 0.9% cases. We noted this variant in Gastrosplenic Trunk; CHA from aorta Celiac Trunk with 2 branches-LGA and SPA-Gastrosplenic trunk. Direct aortic origin of CHA,CHA is arising ectopically from SMA, the common trunk named Hepato mesenteric trunk. The CT giving off the other two branches is named Gastrosplenic trunk. We found the presence of HMT and GST in 1 case. Double left gastric arteries presence of 2 left gastric arteries both arising from CT is very rare. We observed this variation in 1 case and absent Celiac Trunk.**Conclusions:** CT Angiography is a safe and highly sensitive and accurate modality for evaluation of arterial anatomy and its variants.

Keywords: Anatomical variation, celiac trunk, Gastro-duodenal artery, Duodenal artery, hepaticartery.

Anatomical variations of coronary arteries: An angiographic study

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ABSTRACT

Background: The anatomy of the coronary arteries has been continuously studied in a variety of disorders ranging from myocardial ischemia to sudden death. To observe the variations and anomalies of blood vessels, radiographic methods such as Computed Tomography, Coronary Angiography and Magnetic Resonance Angiography have been employed. In our study we are studying the coronary artery anomalies using Coronary Angiography as it provides a much more accurate view of the disease process and of any anomalies and aids the cardiologist in choosing the optimal treatment. Assessment of coronary angiograms is hence an effective approach to understand the principal cause of various diseases such as unstable angina, coronary artery disease, and myocardial infarction, as well as anomalies in the coronary arteries that can lead to fatal conditions including sudden death. **Methods:** All the coronary angiograms of patients who had presented with clinical symptoms, EEG and echocardiogram abnormalities were studied for the anomalies. Total of 600 Coronary angiograms were studied. **Results:** Of 600 coronary angiograms studied,78(13%) were normal,522 were affected, showing anomalies with respect to anomalous aortic origin, myocardial bridging, AV fistula, stenosis, ectasy as etc. The observations and results obtained will be discussed in detail during presentations. **Conclusion:** The knowledge of coronary artery anatomy and its anomalies are also important to cardiothoracic surgeons and emergency medicine specialists during accidents or severe trauma to the heart and even in the occasion of sudden death. It prepares cardiothoracic surgeons for any anomalies that may arise during

angioplasty procedures and related surgeries of the coronaries to avoid complications.

Keywords: Coronary artery, coronary angiography

Study of Left Main Coronary Artery using Angiogram Images

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ABSTRACT

Background: Variations of Left Coronary artery are of diverse pattern with pathophysiology causing sudden mortality. It plays a key role in the blood supply of the heart.**Methods:**100 angiogram images of individuals (85 male & 15 female) who underwent screening for coronary artery disease were retrospectively studied after obtaining consent from both the sex with age interval 40-70 years.The origin, pattern of branching, length and the diameter of left main coronary artery were studied. Its variations were noted and measurements were recorded using computer software. **Results:** Were tabulated and studied with appropriate statistical analysis. Left main coronary artery was observed to originate from the left posterior aortic sinus in 90 % (75 males,15 females) and in 10% (10 males) left main coronary artery was absent, left anterior descending artery and left circumflex artery directly originated as separate ostium in left posterior aortic sinus. The pattern of branching was bifurcation type in 85% (75 males,10 females) and trifurcation in 15% (10 males,5 females).The average length of the left main coronary artery was 10.9mm in males and 9.6mm in females. The average proximal diameter of left main coronary artery was 3.6 mm in males and 2.8 mm females. **Conclusion:** 10% absence of left main coronary artery was noted in this study. The average length and proximal diameter of left main coronary artery was more in males than females. Knowledge of these variations will be a guide for the interventional cardiac procedures and enhance the significance of early screening of the left coronary artery.

Keywords: Left coronary artery, Left anterior descending artery, Circumflex artery

Anatomical and Computed Tomographical Study of Lumbar Pedicles

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ABSTRACT

Background: All together there are 5 lumbar vertebrae, L1 to L4 being typical and L5 being atypical. Lumbar vertebrae have strong and large pedicles. They transmit weight and also help in determining the size and shape of pedicle implants. **Methods:** 75 Human dry adult lumbar vertebra (37 typical, 38 atypical) were collected from department of anatomy SVMCHRC Ariyur and 75 CT scan films (31 typical, 44 atypical) from department of Radiology SVMCHRC Ariyur. Right and left side of the pedicle width, height and length were measured using vernier digital calipers in mm for human adult dry lumbar vertebrae and ortho-view orthopedic digital imaging software were used for CT scan films. **Results:** Mean height of atypical lumbar vertebra is 12.7mm, width 15.63mm, length 23.05mm. Mean height of typical lumbar vertebra is 14.9mm, width 12.24 mm, length 18.48mmMean height of CT scan of atypical lumbar vertebra is 10.83 mm, width 10.11 mm, and length 23 mm. mean height of CT scan height of typical lumbar vertebra is 14.98, width 10.20mm, height 16.57mm. **Conclusion:** Typical to atypical lumbar vertebrae parameters are varying. With no much differences on right and left side of the pedicle. The

comprehensive knowledge of morphological and morphometric features are of utmost important for the surgeons in the pedicle screw fixation procedures.

Keywords: Lumbar pedicle, transpedicular screws

Study of Morphometric Variations of Pedicles in Lower Thoracic and Lumbar Vertebrae Using Computed Tomography

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ABSTRACT

Background: Pedicle dimensions has implications in spinal fusion using transpedicular screw insertion of appropriate size in conditions like degenerative disc disease, spondylolisthesis, fractures, deformity (scoliosis) to achieve stability and minimize motion. Thoracolumbar junction being mobile is more vulnerable to trauma. Insertion of a pedicle screw of larger diameter has shown to expand the pedicle & cause spinal stenosis resulting in spinal cord compression. Lack of knowledge on pedicle inclination leads to breach in medial or inferior cortex and subsequent damage to durometer or root. Angulations are better measured in CTscan/MRI. **Methods:** This study is done with sample size of 102 CT scans procured from Department of Radiology, Ramaiah Medical College & Hospitals, Bangalore. Pedicle length, height, breadth, transverse pedicle angle (medio-lateral), sagittal angle (cephalo-caudal) and canal diameters (Antero-posterior and medio-lateral) of vertebral canal of T10 – L5 vertebrae are parameters measured and tabulated in terms of mean±SD and statistically analyzed. **Results:** The results will be discussed in detail during presentation. **Conclusion:** The height & width of pedicle helps in deciding pedicle screw diameter. The transverse and sagittal angle decide the screw path & trajectory. Detailed morphometric analysis will be useful for the anatomist, neurosurgeon and spine surgeons.

Key words: Pedicle length, pedicle breadth, pedicle angle, pedicle screw entry point

Stereological Estimation of Brain Volume Comparison between Male and Female using Cavalieri Principle in Normal Population by Radiological Images

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ABSTRACT

Background: The volume of an isolated structure within an organ could not be approximated with the help of fluid displacement procedure. This study helps to understand and monitor how the brain ages with the approximation of the volume of the brain. In this study approximated brain volume is done with stereo-logical method. The purpose of this study was to estimate the brain volume with stereo-logical method using Cavalieri principle in normal population by the radiological images with the comparison between male and female. **Methods:** 60 subjects including 30 male and 30 female were examined by multi-slice CT scanner by axial transverse scanning of the brain axially (Un-enhanced CT scans). Scan consisting of 24-28 consecutive slices in a fixed interval for analysis. Point-counting technique was used on each image to estimate whole brain volume. Measurements were performed by blinded technique to subject details and results of other measurements taken. **Results:** We found that the mean value of total brain volume of 30 normal male was found to be 21581.36 + 3349.48 while the mean value of total brain volume of 30 normal females was found to be 20729.79 + 2408.42. **Conclusion:** This study shows that the point-counting method is generally suitable for the estimation of structures printed on films or photographs and the structures showing very intricate surface area in sanctions. Average total brain volume of male was higher than that of female.

Keyword: Brain Volume, Stereo-logical method, Point-counting grid, Cavalieri principle.

Bilateral Asymmetry in the Gonial Angle of Mandible: A Radiomorphometric Study in the North- Indian Population.

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ABSTRACT

Background: Gonial Angle (GA) of the mandible is an indispensable parameter for facial aesthetics. Since mandibular asymmetry has tremendous effect on the outcomes of dental procedures and prosthesis, GA provides vital clinical information as a radio-morphometric index. Hence, the present study was conducted with the aim to examine bilateral asymmetry in this radiographic mandibular parameter in the North- Indian population of Haryana. **Methods:** This study was conducted in the department of Anatomy, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak utilizing 240 adult human dental panoramic radiographs (or orthopantomographs, i.e. O.P.G.'s) obtained from the department of Dental Radiology; which were divided into 6 age groups (30-60 years) with equal number of males and females. The left-sided and right-sided GA values were calculated across different age groups for both the sexes and subjected to appropriate statistical analysis using SPSS software (version 19). **Results:** In both males and females, the left-sided mean GA values were observed to be higher than the right-sided mean GA values. These differences were found to be statistically significant ($p < 0.05$) as well. **Conclusion:** Bilateral asymmetry was recorded for GA in both sexes.

Keywords: Panoramic radiography, Gonial angle, Bilateral asymmetry, Orthopantomographs

Online Anatomy Practical and Viva Voce Examination: Anatomisation of Anatomists in India

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ABSTRACT

Background: The devastating global Pandemic COVID 19 has disrupted the healthcare system all over the world both in delivery of care and delivery of medical education. Assessment of the anatomy knowledge and the mode of teaching taken is equally challenging. **Methods:** 100 anatomists spread all over the world. A valid structured exam pattern in Anatomy was prepared. (b) The students were given online practical & viva-voce based on structured pattern. (c) The session was recorded with consent of the student. (d) The recorded session was presented to randomly selected subjects from all over the world along with a structured questionnaire to be answered. (e) The consent from the subjects was collected and their point of view was observed and statistically analyzed. **Results & Conclusion:** Will be discussed in the presentation.

Keywords: Online practical examination, online anatomy practical examination, virtual examination, COVID 19, Anatomists feedback.

Involvement of Online Learning in Medical Education during Lockdown of COVID-19 Pandemic

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ABSTRACT

Background: The World Health Organization declared covid-19 as a public health emergency and global pandemic on starting of March 2020 so government of India enforced compulsory lockdown on 24 March 2020. Due to this lockdown, we have adopting online learning in various education institutions including medical colleges. These challenges have resulted no cadaveric dissection which restricts the availability of face to face dissection opportunities for medical students so they are unable to complete their clerkships. Anatomy is the foundation stone of medical field from which clinicians improve their clinical skills. Aim of this our study to compare online

learning with face to face learning method. **Methods:** The present study was conducted on 100 medical and dental students(2020-2021)batch. A multiple choice close-ended questionnaire regarding their opinion on online classes and face to face classes were designed and delivered to students through whatsapp and feedback was taken from the students. **Results:** Most of the students agreed that they missed their face to face anatomy learning i.e., cadaveric dissection, face to face lectures and interaction with mentors. The students strongly felt the lack of confidence and difficulty in the topics completed without dissections, models, microscopic slides and other modalities. Half students felt lack of proper gadgets and strong internet connections, a potential barrier in their digital learning. Assessment and practical part teaching were not well satisfactory to the students and their future improvement.**Conclusion:** Face to face learning specially anatomy dissection cannot replace by the online learning method. Implementation of online learning within the curriculum is bound to be challenging however it remains the only solution during COVID-19 imposed lockdown for maintaining the chain of learning.

Keywords: Covid-19, online learning

Perception of Pre-Clinical Medical Students on the Advantages and Disadvantages of Online Assessment Compared to Traditional Method

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ABSTRACT

Background: The use of e-assessment/online tests have increased in higher education over the last two decades. Technology plays a positive role in students learning process and provides an opportunity to give immediate feedback. In India online mode was not used for formative/summative assessment except in fewer renowned institutions. But the usage of online assessment as learning (formative) and of learning(summative) has increased recently in all educational setup because of COVID-19 pandemic. This study aims to know the perception of I year MBBS students on the advantages and disadvantages of using online assessment in formative and internal assessment when compared to the traditional method. **Methods:** In a private Medical College, Cross-sectional survey was done using Google form with standard and validated questionnaires with likert scale scoring(1-Strongly disagree, 2- Disagree, 3-Neutral,4-Agree & 5-Strongly agree)for I year undergraduate medical students, to assess their perception about online vs traditional assessment method. The result was analyzed by both descriptive and inferential statistics. **Results:** Out of 114 students' responses, 47.4% (36%-Agree & 11.5%- strongly agree) that online assessment has positive influence on their learning experience but only 39% were comfortable to use online assessment over traditional method and the others remained neutral (32%) and (29%) disagreed to the statement. By having online trial test and trainings in newer technology 85.1% students agreed to use online assessment but still felt comfortable to use traditional method for assessment. **Conclusion:** In our study, we found that students did not prefer to switch from traditional to an online method in the form of learning or assessment. But they show their willingness to adapt to a blended learning method which gives us a positive hope to change their mindset to accept the 21st-century outcome-based education.

Keywords: Online assessment, Traditional assessment, Google form survey

Prevalence of Stress in Undergraduate Medical Students

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ABSTRACT

Background: The medical educational system underwent a tremendous change during Covid-19 pandemic. The students were forced to attend online classes and clinics and practical were converted into video demonstration. As a result of this the students underwent a lot of stress in the form of academic overload, network issues, not able to understand the subject due to lack of direct interaction with the teachers and an incomplete sense of attending the clinics without seeing the patients. In order to overcome these stress there is a need for counseling services to be made available to all the students in each institution. Hence this topic is chosen to

determine the prevalence of stress and the mental health of the undergraduate students. **Methods:** After receiving the IEC the cross sectional questionnaire based study was introduced using Cohen's perceived stress scale (PSS) and Medical student's stressor questionnaire (MSSQ), to a total of 120 third and final year undergraduate medical students. The obtained data were analyzed using descriptive statistics.**Results:**90% of students expressed their stress, anxiety with moderate depression. Male students exhibited more stress than female students. **Conclusion:** There is lot of stress prevailing among medical students due to Covid-19 pandemic hence this study would help the institutions to set up counseling center for the welfare of the mental health of the students.

Keywords: Pervallence, stress, PSS, MSSQ, Counseling centre, anxiety.

Students Perception about Anatomy Online Teaching during Covid-19 Pandemic

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ABSTRACT

Background: The Covid-19 pandemic has caused a disruption in the academic schedule in Medical Colleges. E learning is a way of teaching supported by digital technologies as underlined by definition that e learning is the use of new multimedia technologies and the internet to improve the quality of learning by facilitating accesses to resources and services as well as remote exchange and collaboration. It is a new learning opportunity for the medical students. Increase in the Covid-19 pandemic worldwide has also added to the importance of online education. **Methods:** Zoom platform was being used for Anatomy online teaching during Covid-19 pandemic. Feedback questionnaire was given to MBBS phase I students of 2019 batch for perception regarding online teaching of gross anatomy lectures taken from June 2020 to August 2020 through Google forms. **Result:** A total of 71 students of MBBS Phase I responded to feedback questionnaire regarding online teaching. More than two-thirds of the respondents were females(70.42). 64.39% students agreed that the schedule of online class was intimated earlier before the class. 60.56% students were satisfied with their understanding of the topic. 83.09% students felt that the teacher was knowledgeable.67.60% students were inspired by the way of teaching. 81.69% students found that the teacher encouraged the participation and discussion among the students. According to 92.95% students, the teacher was friendly and helpful. Majority 76.05% of students felt online teaching was interesting and beneficial.**Conclusion:** Online teaching is the valuable method of teaching during Covid-19 pandemic, e-learning is effective in increasing knowledge and is highly accepted. Internet connectivity continued to be a major problem in online education.

Keywords: Medical education, Perception, E learning, Covid-19.

Coping up with Dream Course: Stress and its Effects on Academic Performance of I MBBS Students

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ABSTRACT

Background: The aim of Medical education is to produce competent, physically and mentally strong health professionals, as they are going to be the pillars of future health care system. If they experience any obstacle at the beginning of their career, it may impede their overall professional development or even lead to change of profession. Stress is one of the most common and process-oriented obstacle in Medical education. **Methods:** This was a questionnaire based, cross sectional study conducted at JSSMC after obtaining Institutional Ethical Clearance. Study was carried out among200 first MBBS students. Questionnaire consisted of 4 parts. Part I: Socio demographic information of the students. Part II: Semi-structured questionnaire Perceived stress scale(PSS).Part III&IV: Consisted of list of stress inducing &relieving factors. **Results and Conclusion:** 74% of the students felt the course was stressful. Among male students PSS score level ranged from 11-75, among

female-23-60. There was significant correlation between the stress level and academic performance. From the study we can conclude that record work, vast syllabus, time management exams, peer pressure are the major stress inducing factors, whereas teachers/mentors, sports, environment of the campus are main stress relieving factors. These things will help us to take measures, so as to help the students convert unfavorable stress to favorable stress and to cope up with the dream course

Keywords: Stress, inducing factors, medical students

Virtual Vs Explicit: Challenges and Opportunities

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ABSTRACT

Background: Virtual Learning-1996 entrepreneurs Glen Jones and Bernard Luskin launched. It is also called online learning. A virtual learning environment (VLE) is a system that creates an environment designed to facilitate teacher's management of educational courses for their students, especially a system using computer hardware and software, which involves distance learning. **Explicit Learning**-Explicit Learning emerged out of research conducted in the 1960s and 1970s. This learning found teachers with the best results spent more time reviewing previously learned concepts, checking whether students had understand concepts and correcting misconceptions during the lesson. **Methods:** Virtual learning is a combination of computer software and the internet to convey/distribute instructions/lectures to students. Explicit learning is a way to teach skills or concepts to students using direct, structured instructions. It is also called "direct learning". Mostly we have use survey methods and experimental methods for judgment of virtual or explicit learning. Most of the results are based on classroom environment. **Results:** In the present century internet and information technology gives vast knowledge related to any subject or areas. In this condition it is necessary to upgrade knowledge by the teacher because student search or find knowledge on the google or use internet. But the physical teachers are important as a guide so that practically share their experiences and knowledge or skill to improve student's subject's knowledge. All the time we haven't use particular method for teaching in that case explicit methods is useful if students are more than 20-25. **Conclusion**-Virtual methods are best for the Medical education.

Key words: Explicit, Virtual

Perceptions of First Year MBBS Students on Learning Anatomy Online Amid Covid-19 Pandemic

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ABSTRACT

Background: With the rise of covid -19 pandemic, digital learning has been implemented in Medical Colleges across India to continue the ongoing Medical education. Anatomy is the basis of medical science and best learned through offline classes that allows students to experience the texture of structures, handling of specimens which allows the budding doctors to treat the patients medically or surgically. The study of anatomy with cadaver dissection has become non-existent in this pandemic period. The purpose of this study is to know the perceptions of the students towards virtual teaching learning in anatomy and potential challenges faced by them. **Methods:** The study was conducted among the first-year MBBS students of AIIMS, Rajkot in the last week of April 2021. Informed consent was taken from the students through google forms. Pre-validated questionnaires were given online to the students and responses noted and were analyzed to derive the descriptive statistical data. **Results:** Result are awaited as it is an ongoing study. Data analysis is in process and will be presented during presentation at conference.

Keywords: Online learning, anatomy education.

'The Beneficiary Triad': Involving Pathology Postgraduates in Teaching Phase-I Undergraduate Histology Sessions under Facilitation of Anatomy Faculty

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ABSTRACT

Background: Advent of Competency Based Medical Education has embarked additional responsibilities to the faculty of Anatomy. Post-graduate reach out and teach programs are common in clinical departments and well established curriculums have been developed in Western countries. A drastic decline in opting post-graduation in Anatomy and prolific growth of numerous Medical Colleges in the past decade has witnessed shortage of faculty, requiring an introspection into present situation. Present study has emphasized in involving pathology postgraduates into teaching schedules of phase-I undergraduates under guidance and facilitation of faculty of Anatomy. **Methods:** Four post-graduate students from the Department of Pathology, 150 phase-I undergraduate students and four faculty members from the Department of Anatomy from Dr. Pinnamaneni SIMS were involved in the present study. Type of study: Mixed study. (1) Qualitative study of perceptions of post-graduates of pathology and faculty of Anatomy. (2) Quasi-experimental study through responses obtained from validated questionnaire from the phase-I MBBS students. **Results:** Out of 150 students 134 responses were obtained from questionnaires. 51.5% have rated good, 29.1% very good and 11.9% excellent for overall sessions conducted by post-graduates. 62.1% students wanted continuation of histology sessions by post graduates. Thematic analysis of perceptions of postgraduate revealed themes which included revisiting of basics, enhanced teaching skills & communication and clinical application. Responses from Anatomy faculty derived a decrease in teaching burden, enhanced alignment & vertical integration, continuation of same program with post-graduates from relevant departments. **Conclusions:** Present study provides a positive aspect of utilization of pathology postgraduates for histology sessions, helping improve their teaching and communication skills, enhancing interdepartmental rapport and a small attempt of filling up lacunae of faculty shortage in Anatomy. The attempt has further succeeded in providing feasibility for vertical integration and enhancing active learning strategies for undergraduates. All the three stakeholders in the process are at beneficiary end.

Key words: Teaching skills, learning strategies, faculty shortage, vertical integration

Dental Anatomy and A Postgraduate - An Untold Story Revealed

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ABSTRACT

Background: Dental Anatomy is a component of basic core sciences program in the initial years of dental school and the development of cognitive knowledge, motor skills and artistic sense in order to restore lost tooth structure is fundamental for dental professionals but its knowledge for a medical postgraduate is entirely a different scenario. The aim of this paper is to reflect upon the theoretical and clinical application of dental anatomy for medical students as well teaching faculty from a dental professional viewpoint in this Covid-19 era where technology based teaching and evidence based practice has become the need of the hour. **Methods:** Kern's 6-step approach was applied in the preparation of this paper. Four learning methods were compared: (a) lecture, (b) lecture + e-module, (c) lecture + skills training, (d) lecture + skills training + e-module. An objective structured clinical examination (OSCE) was also used to measure and compare learning outcomes. Additionally, quiz assessments were made to assess the comprehension of the students after

application of 3D models. **Results:** It was recognized that students who attended skill training as well as lecture had better comprehension of the subject in comparison to the students who attended only lectures. **Conclusion:** Skill training courses in cooperated along with the traditional methods led to improvement in the learning outcomes for both anatomical and clinical skills. Additionally, e-module (i.e. e-learning tool) enhanced the learning effect for the students.

Keywords: Anatomy, Dentistry, e-module.

Bibliometric Analysis of Articles Published in Field of Anatomy under Regional Society of Anatomists of Andhra Pradesh and Telangana during 2010-2021

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ABSTRACT

Background: Bibliometry is a research approach to measure and analyze the productivity of the literature in a specific area or journal. This analysis is significant in the evaluation of the articles which are been published in the field of anatomy. In this study, we aimed to examine the articles published in Anatomy in various journals during the period 2020-2021. **Methods:** The faculty who are registered members of the association are included in the study. The affiliations of the authors, identity, type, content and number of citations of articles published in various journals of Anatomy between 2020-2021 were recorded using the google forms. Descriptive statistics of the data are made. **Results:** The study is ongoing and the final results will be discussed during the presentation. **Conclusion:** The findings obtained in this study are thought to be important for understanding and assessing the research activity by the anatomy faculty and its contribution to the scientific literature in the field of anatomy.

Keywords: Anatomy; article; bibliometric analysis; citation

Perception and Usefulness of Online Classes in Undergraduate Medical Students, an Online Survey

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ABSTRACT

Background: The Covid-19 has disturbed the balance in undergraduate Medical Education, which utilizes traditional methods of small group teachings in dissection halls. Sudden shift from interaction in dissection halls to online prosection has also changed the perception of students on teaching. The objective of present study is to understand the hardships faced by students during online sessions and also the benefits which they felt with sudden shift in mode of teaching. **Methods:** The present study is a cross-sectional descriptive study done on fifty-four first and second year Medical undergraduate students using convenience sampling. A questionnaire was prepared and shared through google forms. The responses were graded using five-point Likert's scale. The ordinal data was used to assess the response of students to online teaching. **Results:** In the present study both qualitative and quantitative data helped to understand the perception of students. 51.9% students (28 out of 54) agreed that integrated computer assisted teaching in dissection hall was beneficial. In 59.3% (32 out of 54) students agreed that regular quizzes and MCQ's were very helpful to retain knowledge for longer time, also sharing of study material was helpful to understand the topic better. But most of them (51.9%) disagreed that knowledge gained from prosection was better than teaching in dissection hall. **Conclusions:** Integrated teaching with

amalgamation of traditional teaching and multimedia tools helps students for proper acquisition of knowledge and better understanding of organs and in-situ structures. Further newer techniques like simulation-based multimedia technology should be experimented for their usefulness in interactive teaching.

Keywords: Gross Anatomy education; Covid 19; Prosection; Online teaching; Survey

Gradual Relaxation in NMC Norms for Opening A Medical College And Impact of this Policy Change in Reducing Interregional Disparity in Terms Of Doctor-Population Ratio: An Analytical Study

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ABSTRACT

Background: To augment the Health facilities and to realize Doctor-population ratio of 1:1000 as recommended by World Health Organization, NMC and erstwhile MCI bring-in a gradual relaxation in norms to open a new medical college and to get the recognition there afterwards. Also, there are some concessions for Tribal and Hilly areas to facilitate the growth of such colleges there. **Methods:** The present cross-sectional, descriptive study was done to compare the Number of Medical colleges and doctor-population ratio in various states in 2000 and 2021. The change in Doctor-population ratio was analyzed using Paired t test. P value of less than 0.05 was considered significant. **Results:** The magic figure of 1:1000 has already been achieved in 2018 but the distribution of Doctors has not been uniform leading to further increase the Rural-Urban Divide and widen the inter regional gap. **Conclusions:** It is time to make policies keeping Quality of Medical Graduates as priority and Inculcating further special provisions to facilitate the retention of Doctors in Rural and Backward Districts.

Keywords: Medical Education, Establishment of Medical College Regulations, Minimum Standards Requirement Regulations

Implementation of Pre Education Session and Its Impact on the Anxiety Index of 1st Year MBBS Students for Cadaver and Bones Handling

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ABSTRACT

Background: Sudden exposure to cadavers and original bones in Anatomy department can lead to development of anxiety resulting in student's inability to relate to clinical aspects. So Pre-Education Session (PES) for newly admitted medical students helps them to acclimatize with the Anatomy dissection hall & demonstration room. **Methods:** It was a cross sectional study conducted on 300 students of Pacific Institute of Medical Sciences (PIMS) & American International Institute of Medical Sciences (AIIMS), Udaipur, Rajasthan. The study had two phases: PHASE-1; Pre Exposure Questionnaire (PEQ) was given to all 300 students of both colleges followed by PES for students for PIMS only. PHASE-2; same questions were asked again after 3 months of exposure and response was compared. A ten Point Visual Analogue Scale (VAS-A) was used to assess the level of anxiety. SPSS 11.0 software was used for statistical analysis. **Results:** 18% of students before Pre Exposure Session felt that PES helps to reduce anxiety while percentage increased to 96 % after PES. Also 96% (PIMS) & 86 % (AIIMS) students believed that CAL can't replace cadaver used for Anatomy dissection. **Conclusion:** PES will help the students to curtail down their anxiety also it is clear that CAL can't replace cadaver.

Keywords: Anxiety index, CAL, Pre Education Session

Anatomical Study of Variations in the Shape of Calcaneal Articular Facets of Human Dry Tali and its Clinical Correlation

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ABSTRACT

Background: Talus is one of the important tarsal bones of the foot, transmitting the body weight to all the other weight bearing bones of foot. It forms subtalar joints by articulating with calcaneum on its inferior surface, thereby maintains the mobility and stability of the joint. The knowledge of morphological variation in shape of calcaneal articular facet of tali is important for the clinician and physiotherapists to understand the underlying pathological cause of various ankle disorders and also for orthopaedic surgeons during treatment procedures on ankle joints. **Methods:** The present study was conducted on 72 (36 right and 36 left) dry human tali of unknown sex and race obtained from the department of anatomy and the bone sets from Medical schools of MBBS Phase 1 (2019-20 batch), MVJ Medical College and Research Hospital, Bangalore. The inferior surface of each talus was examined carefully for the type and number of calcaneal facets and percentage of each type was recorded and statistical analysis was data was performed. **Results:** Out of 72(36 right and 36 left) dry tali, overall type 2 was most common seen in 24 bones (33.3%) followed by type 1 seen in 23 of bones (31.9%). Type 5A was seen in 11 (15.2%) bones Type 3 and type 4 are seen in 7(9.7%) bones each. On the right side out of 36 bones, type 1 was most common and type 5A was least common. On the left side, type 2 was most common and type 4 was least. **Conclusion:** Knowledge of variation of calcaneal facets can be used as an anthropological marker for racial and regional differentiation of unidentified bones. Detailed anatomical information will act as a baseline for advanced treatment procedure.

Keywords: Talus Subtalar joints, calcaneal articular facets, anthropological marker, ankle joint.

Anatomical Variations of Ureters with Its Clinical Importance- A Cadaveric Study

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ABSTRACT

Background: The ureters are muscular ducts which measures about 25-30 cm in length. These ureters drain urine from the corresponding kidney to the urinary bladder. The ureters have two segments: abdominal and pelvic. Malformations of the urinary system are common and comprises about 3% of live births. Congenital anomalies of kidney and urinary tract (CAKUT) is a group of abnormalities affecting the kidneys or other structures of the urinary tract. All these variations differ in severity, which may damage the kidneys or other structures. Severe CAKUT can result in life-threatening kidney failure and end-stage renal disease. Duplication of ureter or double ureter results from early splitting of ureteric bud. Double ureter has been reported through various studies with prevalence of 0.1% to 4%. Incomplete duplication is more common than complete. It may be associated with or without other congenital defects. **Methods:** The present study was conducted in the Department of Anatomy on 50 formalin fixed kidney specimens irrespective of age and sex (25 right and 25 left) and was mainly focused on the ureteric anomaly. The formation of ureters and its duplication were noted. **Results:** Out of 50 specimens, 4 specimens showed variations in the formation of ureter i.e. duplication. Among these 4 specimens, 3 were of left side and 1 of right side. All these structures were confirmed histologically. **Conclusion:** Ureteral injuries are common complications in open or laparoscopic surgical procedures involving the abdomen and pelvic regions. These ureteral injuries can be prevented by prior imaging of the abdomen and pelvis. The comprehensive knowledge of the normal and abnormal patterns of the ureter and its relationship to the surrounding structures are important and prerequisite for both radiologists and surgeons to plan any surgical procedures and to avoid complications.

Keywords: Ureter duplication, injuries, developmental anomaly.

Arterial Variation in the Brachial Artery and its Clinical Implications

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ABSTRACT

Background: Recent progress in vascular surgery has engendered a need for precise knowledge and frequency of anatomical variations in the branching pattern of brachial artery and appreciation of these variations in the upper extremity vasculature is essential to prevent injury, particularly in patients requiring dialysis or undergoing arteriography. To study of vascular pattern of upper limb and its variations assume great importance to prevent and avoid possible complications and achieve best results after surgeries as well as diagnostic and therapeutic interventions. **Methods:** The present study consisted of 78 upper limb specimens of unknown age and sex, for a period of 3 years in Bowring and lady Curzon Medical College and Research Institute, Bangalore. The limbs were completely dissected and neurovascular bundle of the appendage were thoroughly studied. **Results:** Brachial Artery divided into Ulnar and Radial at a higher level than normal in 12 specimens (15.38%). Brachial Artery divided into Ulnar and Radial at a lower level than normal in 6 specimens (7.96%). **Conclusions:** Vascular anomalies occurring in common surgical sites tend to increase the likelihood of damage during surgery owing to the unusual origin and branching pattern of brachial artery in the present study, hence a sound knowledge of the possible variations in the branching pattern could avoid unnecessary complications.

Keywords: Brachial artery, Branching pattern, surgical intervention

Anatomical and Radiological Assessment of Acromion Process of the Scapula and its Clinical Significance in Shoulder Impingement Syndrome and Rotator Cuff Tendinopathy

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ABSTRACT

Background: Shoulder impingement syndrome refers to a condition in which the supraspinatus tendon is chronically entrapped between the humeral head and coracoacromial arch. In Rotator cuff tendinopathy, the tendons forming rotator cuff are in flamed. **Methods:** The study was conducted at Department of Anatomy & Radiology. 80 dry scapulas and 30 MRI scans of patients with shoulder pain were used. **Results:** Curved type (type 11) - 58%, Hooked type (111) in 37% and Flat type (1) 5% of cases (Bigliani's et al). The mean breadth and length of the acromion process were 24.03 mm and 43.6 mm. The mean anterior acromial thickness is 6.94mm, the mean coracoacromial distance is 28.9mm, the mean acromioglennoid distance is 27.35mm. **Conclusion:** Knowledge about different types and measurements of acromion process may help the surgeons while working on variety of shoulder joint ailments.

Keywords: Impinging, scapula, MRI.

A Study on Elongated Styloid Process and its Clinical Significance

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ABSTRACT

Background: Styloid process is a cylindrical bone which arises from the temporal bone in front of the stylomastoid foramen. It gives attachment to three muscles and 2 ligaments. The normal length of the styloid process varies from 2.5 cm to 3 cm. if the length is more than 3cm it was termed as Elongated Styloid Process (ESP) by Eagle in 1937. The presence of ESP leads severe pain over the head and neck region leading to Eagles Syndrome. **Methods:** A total of 100 adult dry skulls were collected and observed for ESP and the length of the ESP was measured and recorded. **Result:** The ESP was observed 20 on the right, 16 on the left and 4 on both sides of the

skull. The length ranged from 2.5 to 5.2cm. The ESP depends on embryology, heredity, and granulation, tissue proliferation following trauma, degenerative alterations and metaplasia. Calcification patterns of this elongated stylohyoid complex plays an important role in causing craniofacial or cervical pain. **Conclusion:** The data of the present study will help the clinicians to diagnose the calcification of ESP and treat the patients with eagles syndrome.

Key words: Metaplasia, Styloid Process

Anatomical Study of Patellar Ligament of Knee Joint with its Clinical Significance

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ABSTRACT

Background: Patellar ligament of knee joint is the strong, flat central band of 6-8cm tendon of quadriceps femoris which extends from the apex of patella to the superior smooth area of tibial tuberosity. The present study was aimed to observe and analyze the morphometric measurements of the ligament and its symmetrical presentation in the cadavers. **Methods:** For present study ninety (45 right and 45 left) knee joints were dissected from the previously formalin fixed embalmed cadavers. In the anterior aspect of knee joint skin and overlying tissues were removed carefully. The patellar ligament was identified & dissected carefully. The morphometric measurements were obtained by digital vernier caliper and data were analyzed statistically. **Results:** The mean length of patellar ligament on right side & left side was found 59.26mm & 61.91 mm respectively. The mean width was found on right & left side 28.33mm & 28.95mm respectively. The mean thickness in proximal part on right & left side was found 5.00mm & 5.8mm respectively and in distal part was found 4.6mm & 5.4mm respectively. **Conclusion:** The present study suggested the knowledge on patellar ligament of knee joint and can be useful in various knee surgeries like total knee replacement, procedure of tibial osteotomy, tendon or ligament surgeries, ACL repair surgery and in sports medicine to the orthopedic surgeon, General surgeon, plastic surgeon, radiologist, physical therapist, anthropologist.

Keywords: Patellar ligament, knee extensor mechanism, Bone-patellar-Tendon-bone, Autograft

Hypoplasia of 4th Part of Vertebral Artery and its clinical significance

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ABSTRACT

Background: The anatomical and morphological variation of vertebral artery has clinical importance not only for the performance of interventional or surgical procedure itself but also to ensure their safety. **Methods:** The present study was conducted in the Department of Anatomy, Vinayaka Mission's Kirupananda Variyar Medical College & Hospitals, Salem, and Tamilnadu, India. In 15 adult human brains specimens acquire from embalmed human cadavers were studied 4th parts of vertebral arteries variations and its diameters were measured using a vernier caliper. **Results:** The mean diameter of 4th part of left vertebral artery has been larger in size than the right vertebral artery with a mean of 2.55mm ± 0.30mm. In one specimen for left side morphological variation was noted. The variation of left vertebral artery which was very narrow had a diameter of 0.1mm and on right side 0.4mm. **Conclusion:** Hypoplasia of 4th part of vertebral artery is a contributing factor in acute ischemia of brain. Morphological variations of vertebral artery considered as an etiological factor for conditions like atherosclerosis, infarction, vascular malformations, transient ischemic attack and syndromes like Wallenberg's and Medial Medullary syndrome. Vascular variations usually subjects of controversy, detailed knowledge of such variations serve as a key role in procedures like MRI, CT and neurovascular surgeries. The study will be done extensively to support the anatomical and

morphological variations of vertebral arteries to make fruitful in clinical implications.

Keywords: Vertebral artery, variation, cranial part, diameter, hypoplasia

Anatomical Basis of Gender Reassignment Surgery

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ABSTRACT

Background: Transgenders are part of our society. They are absolutely normal physically and mentally but the sex of choice is incongruent with the sex assigned at birth. The supreme court has given them full rights on sex change surgeries. Gender reassignment surgery is part of a treatment for gender dysphoria in transgender people and include top surgery, bottom surgery and facial feminization beside other contour correction procedures. **Methods:** We have made a review of 10 male to female sex reassignment bottom surgeries done at Amrita hospital to study how the normal male anatomical parts are changed into appropriate female genitalia to give both emotional and sexual satisfaction. **Results:** By the reconstructive methods we could create aesthetically & functionally acceptable vagina and vulva as well as normal micturition, normal erogenous sensation and an overall satisfactory sexual function in 9 cases. **Conclusion:** Surgeons should have a clear cut idea about the anatomy of the male and female genitalia as one proceed with the surgery. In male to female transgenders, one should know how to construct the female genitalia in a male ie. clitoris from glans penis with special attention to retain its innervations, labia minora as well new vaginal canal from penile skin tissue, labia majora from post orchiectomy scrotal skin fold, shorten the long male urethra to that of a female- for a satisfactory outcome.

Key words: Clitoris, glans penis, labia majora, penile skin tissue, scrotal skin fold, transgender, urethra, vagina

Role of Ethanolic Extract of Brown Seaweed *Sargassum Wightii* in Ameliorating Diabetic Changes in Liver of Streptozotocin-Induced Diabetic Rats

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ABSTRACT

Background: Diabetes mellitus is a metabolic syndrome affecting major organs of the body including the liver. In this study, the potential protective effect of ethanolic extract of seaweed *Sargassum wightii* on the liver was investigated *in vivo*. **Methods:** Streptozotocin 50 mg/kg was injected intraperitoneally, continuously for three days to induce diabetes in male Wistar rats. The standard drug used for comparison was metformin hydrochloride. The rats were divided into four groups, each containing six animals, as follows. Group A- normal rats treated with 0.9% NaCl, Group B-diabetic rats treated with 0.9% NaCl, Group C- diabetic rats treated with metformin 250 mg/kg, and Group D- diabetic rats treated with ethanolic extract of *Sargassum wightii* 500 mg/kg. The animals were treated by oral gavage for four weeks. At the end of the experiment, the animals were euthanized, the liver was collected, fixed in 10% neutral formalin, stained with H&E, and observed under the light microscope; magnification x100. **Results:** Group A showed normal hepatic architecture. In Group B, there was adistortion of hepatic architecture, dilatation of central vein, and sinusoids, and signs of inflammation. Group C treated with metformin 250 mg/kg revealed the near normalization of the histopathological changes. The Group D administrated with *Sargassum wightii* ethanolic extract 500 mg/kg minimized the histomorphological changes in the liver. **Conclusion:** This study inferred that the administration of ethanolic extract of *Sargassum wightii* 500 mg/kg/day exerted a protective role against diabetes-induced hepatic changes.

Keywords: *Sargassum wightii*, seaweed, hyperglycemia, diabetes, liver morphology

Anatomical Study of Variations of Sacral Hiatus and its Clinical Relevance in Caudal Epidural Block

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ABSTRACT

Background: Sacral hiatus is the opening present at the caudal end of sacral canal. Non fusion of laminae of 4th or 5th sacral vertebrae results in its formation. Clinically sacral hiatus is used for epidural injections. Present study is aimed at determining the anatomy of sacral hiatus with the help of morphometric measurements and to identify significant anatomical variations to locate it for caudal epidural block. **Methods:** Total 96 dry human sacra from Department of Anatomy, SRMS-IMS, Bareilly, UP, India, were studied to know the anatomical variations of sacral hiatus. Study period were from July 2016 to December 2016. **Results:** The average height of sacral hiatus were 34.13±11.82 mm. Different shapes of sacral hiatus were observed, inverted U shaped hiatus were most common. The apex of the sacral hiatus was most commonly found at the level of 4th sacral vertebrae. Right and left superolateral crests of the sacrum were taken as two points on dorsal surface of sacrum (forming the base of a triangle) because posterior superior iliac spines, impose on superolateral sacral crests. The distance between the two superolateral crests, the distance between the right and left superolateral sacral crest and the sacral apex were on average 60.61±6.71, 61.95±11.71 and 61.40±11.98 mm respectively. **Conclusion:** An equilateral triangle formed between the apex of sacral hiatus and right and left superolateral sacral crests. This equilateral triangle will help in determining the location of the sacral hiatus during caudal epidural block. Also the length of sacral hiatus should be kept in mind. **Keywords:** Caudal epidural block (CEB), Sacral Hiatus (SH).

Determining New Anthropometric Markers for Screening Hypertension in the Caribbean Region

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ABSTRACT

Background: The prevalence of hypertension in the Caribbean is high (35-38% in Saint Kitts). It contributes to 51% of deaths secondary to ischemic heart disease and hence being a leading cause of death in the Caribbean region. **Methods:** In a cross-sectional study, a total of 635 subjects were involved in the study utilizing health centers and health camps in St Kitts (West Indies). Height-to-waist ratio (HtWR), ABI (Arav Body Index) was measured using a ratio of Waist and Combined Thigh & Height, Thigh to waist ratio (TWR) and Wrist to arm ratio (WAR) was compared to WHtR, WHR and BMI. **Results:** In men, AUROC of HtWR (0.690) and Inverse ABI (0.632) was superior as compared to other Anthropometric markers for predicting the development of hypertension whereas WTR (0.687) being more superior in Women. Among women recommended cut off for WTR is 1.6 and among men for HtWR and Inverse ABI is 2.3 and 2.84 respectively. **Conclusion:** We conclude that HtWR and Inverse ABI is more reliable marker in Men for predicting the development of hypertension whereas WTR being more reliable in Women in population of St. Kitts. This will help at-risk individuals to take preventive measures like lifestyle modification. **Keywords:** Anthropometric measures, hypertension, receiver operating characteristics, ABI, HtWR

Morphological and Morphometric Study of Glenoidal Cavity of Scapula with its Clinical Implications

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ABSTRACT

Background: Glenoidal cavity of the scapula articulates with the head of humerus to form gleno-humeral part of the shoulder complex. Dislocation of the shoulder joint is directly related to the shape and size of the glenoidal cavity of the scapula. The knowledge of shape and size of the cavity is helpful for the clinicians in surgeries related to shoulder joint. Hence in this we planned to study a complete morphology & morphometry of the glenoidal cavity with its clinical correlation. **Methods:** Total of 100 dry human scapulae of unknown age & sex were obtained from the Anatomy department Museum. Out of 100 scapulae, 50 were of right side and 50 were of left side. The shape of the glenoidal cavity were observed on the basis of presence or absence of glenoidal notch. The maximum length, maximum width and the width of glenoid cavity at the level of glenoidal notch were measured using digital vernier caliper, glenoidal index was calculated. All the parameters were analyzed and tabulated statistically. **Results:** The average superior-inferior diameter on right and the left sides were 33.67±2.82mm and 33.92±2.87mm respectively. The average anterior-posterior diameter of the lower half of the right glenoid was 23.35±2.04mm and that of the left was 23.02±2.30mm. The mean diameter of the upper half of the right glenoid was 16.27±2.01mm and that of the left was 15.77±1.96mm. **Conclusion:** The dimensions of the glenoid observed in the present study were lesser than those recorded in the studies done on other populations. This fact may be taken into consideration while designing glenoid prostheses for the south Indian population. The current study recorded a higher percentage of glenoid cavities having the glenoid notch as compared to earlier studies. While evaluating defects/lesions of the glenoid, this fact could be useful.

Keywords: Glenoid cavity, Glenoid Index, Gleno-humeral joint, Scapula.

A Morphometric Study on Hip Radiographs with Predilection towards Hip Dysplasia

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ABSTRACT

Background: Hip dysplasia is an important cause of osteoarthritis, which accounts for a significant proportion of patients requiring total hip arthroplasty. The diagnosis of mild hip dysplasia is primarily based on the detection of deficient coverage of femoral head by the acetabulum. The inter-relationships between various angles measured in the radiographs of hip joint with predilection for hip dysplasia. The influence of sex and age on the development of hip dysplasia was also determined along with potential complications of hip dysplasia in young adults. **Methods:** 135 hip radiographs were studied and various angles (Centre-edge angle, Femoral head-neck-shaft angle, Tonnis angle, Delta angle) were measured in the Department of Anatomy, M. S. Ramaiah Medical College, Bangalore, Karnataka, India. To study the hip radiographs and measure various angles and there by review the imaging features for presence of any hip dysplasia. **Results:** Out of one hundred and thirty five standardized plain radiographs of hip region (AP view) studied and various angles (Centre-edge angle, Femoral head-neck-shaft angle, Tonnis angle, Delta angle) measured, 10% were found to be borderline dysplastic based on the cut off values for center edge angle, 41% were found to have coxa vara, 26% were found to be dysplastic based on the limits set by Tonnis angle and 12% exhibited signs of fovea alta. **Conclusion:** Hip dysplasia often results in osteoarthritis of the hip at a comparatively young age. The treatment is total hip arthroplasty, which may require revision surgeries or Hip resurfacing another commonly used modality. Hence diagnosing hip dysplasia at the earliest is important for radiologists and orthopaedicians so as to initiate treatment.

Keywords: Hip dysplasia, radiograph, osteoarthritis

A Study of Morphological Variations of the Human Rib in Dry Bone Specimens and Its Clinical Significance

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ABSTRACT

Background: This study aims to find out morphological variations of human ribs such as cervical rib, synostosis of ribs, bifurcations of the rib, etc. Bifid rib is a developmental disorder where sternal end of a rib is split into two. Bicipital rib results due to fusion of cervical rib with the first rib or the first rib with the second. The cervical rib is an additional rib which arises from seventh cervical vertebra.

Methods: The present study was conducted on 500 dry human ribs of unknown age and sex from the bone store of Anatomy Department, B. J. Medical College, Ahmedabad, Gujarat. Morphology & incidence of different types of the ribs were studied in detail. **Results:** Out of 500 ribs we found 10 (2%) fork type of bifid rib, 2 (0.4%) hole type of bifid rib, 3 (0.6%) bridged type of fused rib, and 1 (0.2%) cervical rib (type IV according to Sargent classification/it is also a type of bicipital rib). **Conclusion:** The rib anomalies whether pathological or normal variants such as cervical rib, pelvic rib, bifid rib, bicipital ribs etc, often indicate an underlying systemic disorder. Bifid ribs and fused ribs are also encountered in Gorlin's syndrome. Cervical ribs may compress the lower part of brachial plexus and subclavian artery or vein; which is known as thoracic outlet syndrome. Precise knowledge and awareness of such anomalies is important for anatomists, clinicians, thoracic surgeons and radiologists.

Keywords: Bifid rib, Bicipital rib, Cervical rib, Thoracic outlet syndrome, Gorlin's syndrome

The Baseline Study of Anatomical Parameters of Difficult Mask Ventilation In Indian Population

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ABSTRACT

Background: Difficulties or failure in the management of airway is the main reason of morbidity and mortality. The difficulties and failure rate can be minimized by predicting the difficult airway so that an effective preoperative Anesthetic plan can be introduced for safe mask ventilation. There are some tests that can be done predict difficult airway like Mallampatti classification, sternomental distance, interincisal distance, thyromental distance, neck circumference and mandibular protuberance test. Aim of study is to give the baseline values of parameters used in assessment of difficult mask ventilation in Indian population. **Methods:**This study is composed of a total of 120 individuals (63 males and 57 females).Each subject had its interincisal distance(metallic ruler), neck circumference(flexible tape), mandibular protuberance(grading), Thyromental distance and sternomental distance (rigid ruler) measured and as well as modified Mallampati classification done. Comparison of parameters between male and female was done by independent t-test. The p value less than 0.05 was considered statistically significant.**Results:** There was statistically significant variation ($p < 0.05$) in sternomental distance, interincisal distance, thyromental distance, neck circumference between male and female. Females had lower values of these parameters than compared to that of males. Modified Mallampati Classification (MMC) class 3 was observed in 3 males while none in females. MMC class 4 was found in 1 male. Mandibular protuberance grade B was found in 14 males and 11 females. **Conclusion:** Average value of sternomental distance, interincisal distance, thyromental distance, neck circumference in male was 18.40, 4.19, 8.82 and 36.63 respectively while in female it was 17.51, 3.90, 8.46 and 33.58 respectively. These baseline values will help in appropriate designing of the equipment utilized in assessment and management of difficult mask ventilation in Indian population.

Key words: Mallampati, protuberance, thyromental distance

Morphometric Study of Jugular Foramen and Jugular Fossa of Dried Adult Human Skulls and its Clinical Significance

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ABSTRACT

Background: Jugular foramen is one of the most fascinating foramina of the human skull. It is a complex, irregular bony canal located between the occipital bone and petrous part of temporal bone. Many important structures like 9th, 10th, 11th cranial nerves, meningeal branch of occipital and ascending pharyngeal arteries, internal jugular vein and inferior petrosal sinus are passing through it. The jugular fossa has a septum and a dome. The septum divides the foramen into two compartments: anteromedial compartment (Pars nervosa) and posterolateral compartment (Pars vascularis).The dome contains superior bulb of internal jugular vein. The architecture of the foramen varies in size, shape, laterality besides differences related to sex and race. The morphometric measurements of jugular foramen are very important for neurosurgeries and head and neck surgeries. **Methods:** A total number of 60 jugular foramina were examined from 30 adult dry human skulls of unknown age and sex from Department of Anatomy, PSG Institute of Medical Sciences and Research, Coimbatore. Measurements were taken using Digital Vernier calipers. Results were analyzed statistically. **Results:** The Length, Width and Surface area of jugular foramen of right side were measured and compared with left side. Length and width of the jugular foramen was significantly higher on the right side. The presence of partial septum was found in 27 skulls (90%) on the right side and in 29 skulls (99.7%) on the left side, respectively. Dome was present in 100% of the jugular foramina on the right side and 90% of the jugular foramina on the left side. Separate opening for inferior petrosal sinus was found in eight skulls (27%) on the right side and four skulls (13%) on the left side. **Conclusion:** This study provides a clear understanding of anatomy of jugular foramen and supports the reported morphometric variations. The morphometric variations of jugular foramen in the parameters of the skull are probably due to ethnic and racial factors. Knowledge of these variations is important for neurosurgeons and radiologists who deal with space occupying lesions of the structures surrounding the jugular foramen. This study may be helpful for ENT surgeons while performing middle ear surgeries.

Key words: Jugular foramen, internal jugular vein, dome, septum and cranial nerves

Morphometric Study of Hyoid Bone and its Clinical Implication

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ABSTRACT

Background: Hyoid bone, although small in size, proportionately plays a very vital role in the biodynamic system which regulates mastication, deglutition and phonation. The aim of this study was to investigate the morphological and morphometrical variations of the hyoid bone in south Indian population. **Methods:** The study was carried out on 25 hyoid bone specimens of both sexes available in department of anatomy. The shape and weight of bone and various dimensions like width and height of individual part and various angles subtended by various part of the bone were measured. **Results:** The average height of body was found to be 8.32 mm, width of the body ranged between 1.2-3.8 mm; the average length of right greater cornu was 3.18 mm and that of left 3.05 mm; distance between tips of greater cornu was found to be within the range of 34-50 mm. **Conclusion:** All the anthropometric measurements of hyoid bone were significantly greater in males than in females. These findings can be used for forensic investigation as well as archeological studies. The variations of the hyoid bone has a great significance for surgical procedures of neck

region, and in forensic medicine for evidence of strangulation or hanging, which causes fractures.

Keywords: Hyoid bone, greater cornu, lesser cornu, morphology, morphometry

Impact of Gender on Clinical Manifestations of Celiac Disease in Western Rajasthan

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ABSTRACT

Background: Celiac disease (CD) is an autoimmune disorder and it affects the gastro-intestinal tract which is characterized by persistent inflammation of small intestine. CD affects about 1% of the world's population. The prevalence of CD in this North Indian community is 1 in 96. Celiac disease hinders intestinal absorption of various nutrients including calcium and leads to many skeletal disorders such as rickets, osteomalacia, osteoporosis and osteopenia. Dual energy X-ray absorptiometry (pDXA) provides an easy and convenient method of evaluating bone mineral density (BMD) in young subjects. Early diagnosis & treatment of celiac disease during childhood may protect CD patients from osteopenia & osteoporosis. **Methods:** The study was conducted in Department of Anatomy, Sardar Patel Medical College, Bikaner, Rajasthan. A total of 90 subjects, 60 control group and 30 celiac disease patients in case group were included in study with informed consent. In case group 19 subjects were male and 11 subjects were female while in control group, 32 subjects were male and 28 subjects were females. The BMD was measured in case and control group at calcaneum by peripheral dual X-ray absorptiometry. **Results:** We have found that the BMD values were different when compared to the male and female group. BMD of male and female of the case group was (-0.72 ± 0.52) & (-1.13 ± 0.29) . p value was $(p=0.011)$, which was significant and when compared with the BMD values with females of the control group it was (-1.13 ± 0.29) & (-0.55 ± 0.58) . P value was $(p=0.003)$ which was significant. **Conclusion:** From this study, we have concluded that the females who are suffering from celiac disease have lower BMD and are at higher risk of developing osteopenia. Proper gluten free diet and early assessment of BMD is required.

Keywords: Bone mineral density, Celiac disease

A Morphometric Study of Upper End of Adult Human Tibia with Its Clinical Relevance

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ABSTRACT

Background: The proximal end of tibia is a key component of the knee joint through the tibio-femoral articulation and plays an important role in the transmission of body weight. The knee joint is commonly affected by various forms of arthritis such as inflammatory and post traumatic arthritis of which osteoarthritis is the most common pathological condition being treated with knee arthroplasty. **Methods:** 50 Dry processed tibia bones obtained from the department of anatomy, MS Ramaiah Medical College. The anteroposterior and transverse measurements of medial and lateral condyles were taken on both right and left side. **Results:** Anteroposterior measurement of medial condyle on right and left side are 42.3 ± 5.3 and 44.9 ± 3.6 . Transverse measurement of medial condyle on right and left side are 29.4 ± 3.8 and 31.4 ± 2.3 . Anteroposterior measurement of lateral condyle on right and left side are 37.9 ± 4.1 and 37.4 ± 3.0 . Transverse measurement of lateral condyle on right and left side are 30.1 ± 3.5 and 31.3 ± 2.7 . Transverse measurement of medial articular surface on the left was found to be significantly more than the right side. **Conclusion:** Information regarding morphometry of upper end of the tibia is vital as it provides reliable method of assessing knee deformity. In knee arthroplasty use of appropriate tibial component size is essential to maintain the normal functional range of motion of the knee. The present study will be an attempt to provide

anatomical parameters which can determine the measurements of the prosthesis so as to produce normal kinematics, reducing wear and tear and achieve greater longevity.

Keywords: Tibial condyles, Knee arthroplasty, Prosthesis,

Abdominal Adipose Tissue A Torch Bearer for Type 2 diabetes Mellitus-A Cross Sectional two Group Comparative Study at Tertiary Care Hospital

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ABSTRACT

Background: Obesity has raised to global pandemic in the 21st century. The study estimates a 33% increase in obesity prevalence and a 130% increase in severe obesity prevalence over the next 2 decades. It is also estimated that for every 1 kg increase in body weight there is a 4.5% higher risk of developing Type 2 Diabetes mellitus (T2DM). Several studies have shown that incidence of T2DM among Asian Indians are more compare to Hispanics due to their genetic predisposition, dietary habits, lower muscle mass & lack of physical activities. Though it is well established fact that abdominal obesity, higher BMI are key in the development of T2DM, several Indians despite of having optimum BMI show higher incidence of insulin resistance & T2DM. Thus we aimed to investigate the Histomorphological patterns of adipose tissue among the type 2 diabetics & non diabetic individuals. **Methods:** Prior to the start of the study institutional ethics committee approval was obtained. As per the inclusion & exclusion criteria 25 members who were undergoing elective abdominal surgery were selected in type 2 diabetic & non diabetic group. Earlier to the clinical history & tissue sample collection each participant was given information sheet & taken written consent for voluntary participation. During the abdominal surgery biopsy of subcutaneous & omental adipose tissue samples were collected, preserved in formalin solution & -80°C. Further did the histology slide preparation, staining done using H & E, special stain. The parameters were analysed through software & compared with biochemistry lab parameters, BMI. Probability value less than 0.5 was considered as significant. **Results:** There was depot specific difference between the 2 groups with respect adipocyte size, extra cellular matrix features. **Conclusion:** In our study we could conclude that abdominal adipose tissue was morphologically different among diabetics & non diabetics. Early prediction of these changes through noninvasive technique in target population helps in reduction in co-morbidities & mortalities among type 2 diabetic individuals

Keywords: Obesity, Pandemic, Adipocyte, Type 2DM, BMI

Association of Maternal Pre Eclampsia with Birth Weight of Newborn

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ABSTRACT

Background: Pre-eclampsia is a multiorgan, heterogenous disorder of pregnancy associated with significant maternal and neonatal morbidity and mortality due to uteroplacental insufficiency resulting in a compromise of blood flow to the fetus. Anthropometry is the measurement of physical dimensions of the human body at different ages and is an effective and frequently performed child health and nutrition screening procedure. Pre-eclampsia is associated with Preterm delivery, Fetal Growth Restriction often with Asymmetric fetal body proportion, 5% decrease in birthweight, and are also 3.6 times more likely to deliver small for Gestational Age babies compared to normotensive mothers. In the present study an attempt has been made to find association of maternal Pre-eclampsia with birth weight of newborn. Birth weight of newborns of Pre-eclamptic mothers were compared with newborns of Normotensive mothers and also compared in between newborns of Mild Pre-eclampsia and Severe Pre-eclampsia. **Methods:** Study was conducted in the

Department of Obstetrics and Gynaecology and Department of Anatomy, on 60 newborns of Pre-eclamptic mothers and 60 newborns of Normotensive mothers delivered at Sri Siddhartha Medical College And Research Center. Birthweight of newborns were measured within 24hrs of birth. **Results:** Total 120 newborns were included in the study, out of which 60(50%) newborns were of Normotensive mothers (group-1) (control) and 60(50%) were the newborns of Pre-eclamptic mothers (cases), in which 39(32.5%) were newborns of Mild Pre-eclamptic mothers (group-2) and 21(17.5%) were newborns of Severe Pre-eclamptic mothers (group-3). The incidence of low birth weight was high in newborns of Pre-eclamptic mothers (mild Pre-eclampsia-LBW-30.8%, VLBW-10.3% and severe Pre-eclampsia-LBW-52.4% VLBW- 19.1%) compared to normotensive (LBW-15%). **Conclusion:** Birth weight of newborns of Pre-eclampsia were decreased and with increasing grades of hypertension. Pre-eclampsia is one of the important cause of fetal mortality and morbidity. This study may help to provide baseline information for planning subsequent growth charts.

Keywords: Pre-eclampsia, Low Birth Weight, Very Low Birth Weight.

Anatomical Study of Variant Obturator Vein in Indian Cadavers

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ABSTRACT

Background: Obturator vein (OV), formed in the proximal adductor region and traverses through the obturator foramen along with the obturator artery and nerve to terminate in the internal iliac vein (IIV). It is sometimes replaced by an enlarged pubic vein that terminates into the external iliac vein (EIV) thus forming the venous corona mortis. The present study aims to report the prevalence of variant obturator veins that form the corona mortis in Indian cadavers. **Methods:** Present study included 25 adult human cadavers and 11 hemi-pelves. The specimens with variant OV were traced to their termination into the internal or external iliac system. The size of the variant obturator veins and their distance from the pubic symphysis were measured. **Results:** Variant obturator veins were observed in 34.42% (21 specimens), and 85% of these veins (18 specimens), crossed the superior pubic ramus. In 21.31%, two OVs were noted in which the veins either drained into the IIV as a common trunk, or separately into the IIV and EIV. In 14.75%, two veins emerged from the obturator canal, draining into IIV and EIV separately. In 4.92% of the specimens, two obturator veins were observed to exit the obturator foramen but united with each other before terminating into the IIV. In one specimen (1.64%), a single obturator vein divided into two before terminating into the EIV. The average diameter of the variant OV on the superior pubic ramus was 4.12 ± 1.2 mm. The average distance between the variant OV and the symphysis pubis was 45.28 ± 7.65 mm. **Conclusion:** Present study appreciates the variant anatomy of obturator vein and its relation to the superior pubic ramus. Understanding these variations will help to avoid the risk of injury and haemorrhage in pelvic surgeries as well as endoscopic procedures.

Key words: Obturator Vein, variant

Study of Morphological Variations in Fissures and Lobes of Cadaveric Livers

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ABSTRACT

Background: Anatomically it has left and right lobes which are divided by falciform ligament, fissure for ligamentum venosum and fissure for ligamentum teres. It has caudate and quadrate lobes as the parts of right anatomical lobe. Anatomical variations in cadaveric livers are present in form of elongation of left lobe, hypoplastic lobe, accessory fissure and diaphragmatic groove on anterosuperior surface of liver. **Methods:** This study was undertaken in 30 cadaveric liver specimens obtained during routine anatomical dissections. The preserved livers were exposed to study the morphological features like accessory fissures and variations in left

lobe. Presence of anatomical variations was observed and photographed. **Results:** Of the total 30 liver specimens, 19 livers are normal. 3 livers showed variations with elongated left lobe, 4 showed accessory fissure, 1 liver showed anterosuperior surface diaphragmatic impressions, 2 livers showed conical shape right lobe/hypoplastic left lobe. **Conclusion:** The knowledge of its abnormality becomes very important to anatomist, clinician, surgeon and radiologist for minimizing the complications and may be helpful for the surgeons and radiologist for proper interpretation of correct diagnosis and surgical procedures.

Keywords: Human liver variations, Accessory fissure, Hypoplastic lobe

A Unusual variation of Superficial Palmar Arch in Hand

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ABSTRACT

Background: The superficial palmar arch is an anastomosis fed mainly by the ulnar artery. About one-third of superficial palmar arches are formed by the ulnar artery alone, a further third are completed by the superficial palmar branch of the radial artery, and a third by the arteria radialis indicis, or a branch of either arteria princeps pollicis or the median artery. **Case Description:** In the present case, during routine dissections of the flexor surface of the wrist and palm for undergraduate students in the Department of Anatomy, Kalpana Chawala Govt. Medical College, Karnal, an usual variation was found in the formation of superficial palmar arch. The variation found was neatly dissected and photographs were taken. In the present case, the anastomosis has occurred between the ulnar artery and 1st dorsal metacarpal arteries in the hand, with the ulnar artery going a long way which includes passing through the first commissure thus establishing a true vascular convergence area, "crossroads" style in the thumb's commissure. The details of these variations will be discussed in the paper. **Conclusion:** The superficial palmar arch, a dominant vascular structure of the palm of the hand, is the center of attraction for most of the surgical procedures and traumatic events in the hand. Therefore, the variations of superficial palmar arch should be taken into account when surgically approaching the area due to the risk of injuring the vessels and damaging the vascular circulation of the thumb & hand.

Keywords: Superficial palmar arch, variation, ulnar artery, first dorsal metacarpal artery, surgery

Morphology and Variations in Atlas Vertebrae in North Indian Population: An Osteological Study

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ABSTRACT

Background: First cervical vertebra or atlas has different anatomical features as compared to other cervical vertebrae. It holds globe of skull and lacks body and spine. It is subjected to great amount of variations in its morphology in relation to accessory foramina, superior articular facet and posterior arch. It is composed of 2 lateral masses linked by anterior and posterior arches. Posterior atlanto-occipital membrane is attached to posterior arch. Lateral edge of this membrane sometimes ossifies thus converting groove into canal. Consequently, neurovascular groove gets converted into a bony ring "ponticulus posticus". It is considered as potential cause of neck pain and headache. The knowledge of these variations must be known to orthopedic and neurosurgeons to avoid vertebral artery and spinal cord injuries which may lead to various neurological symptoms. Congenital defects of atlantal arch a developmental failure of chondrogenesis is a rare anomaly. These defects are a benign variation discovered incidentally. Detection of these anomalies is clinically important as they can cause acute neurologic deficits, which is associated with neck extension. Curran et al. proposed classification of posterior arch anomalies. Type A Failure of posterior midline fusion of the 2 hemi arches. Type B Unilateral cleft. Type C Bilateral cleft with persistent dorsal part of arch. Type D Absence of posterior arch with persistent posterior tubercle. Type E Absence of entire posterior

arch. **Methods:** 100 atlas vertebrae were studied in the Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India. Vertebrae were examined to look for normal morphology as well as for any variation. Presence of any accessory foramina, shape of the superior and inferior articular facets, presence of constrictions and grooves in the superior articular facets and their tendency of separation were observed. **Results:** Foramen transversarium was found present in all the specimens. Accessory foramina were present in 22% and unfused foramen transversarium was found in 1% of specimens. Superior articular facet showed various variations in its shape while the inferior articular facet was found to be consistent in its morphology in all the specimens. Dumb-bell shaped superior articular facet was observed in 67% of specimens. Constrictions and grooves were observed in 73% and 53% of the specimens respectively. Posterior arch variations were noted in 12% of the specimens. **Conclusion:** This study will help in determining cause of neurological deficit in patients due to presence of above variations. Accurate evaluation of anatomic landmarks in patient with migraine or neck ache is important because changes in anatomy of atlas may be index pointing towards underlying disease process like vertebra basilar insufficiency. Asymmetrical deviations of cervical vertebrae in form, size, shape, and contour are often multiple and confusing. Therefore, they must not only be studied with care and precision and meticulously recorded. **Keywords:** Atlas, First cervical Vertebra, Ponticulus Posticus, Posterior Arch, Superior Articular Facet

Variation in Branching Pattern of Axillary Artery

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ABSTRACT

Background: The axillary artery variations are a rule rather than an exception. These variations are of anatomical, radiological, and surgical interest and can lead to iatrogenic injuries during invasive procedures. Knowledge of the same is critical for the operating surgeon and such variations should be kept in mind. **Methods:** The objective of this study is to observe variations in Axillary Artery branches in human cadavers. We dissected 64 limbs of 32 human adult embalmed cadavers in the department of Anatomy, GGMC, Mumbai. **Results:** We found variations in branching pattern of axillary artery. Anatomical variations included: origin of lateral thoracic artery from the subscapular artery; absent thoracoacromial trunk and all its branches arose directly from the second part of the axillary artery; division of thoracoacromial trunk into deltoacromial and clavipectoral trunks, which were divided into all branches of thoracoacromial trunk; origin of subscapular, posterior circumflex humeral and profunda brachii arteries from a common trunk from the second part of the axillary artery; and origin of thoraco-acromial, Lateral thoracic and Subscapular arteries from a common trunk from the second part of the axillary artery. **Conclusion:** The study was carried out to show important variations in the branching pattern of axillary artery, in order to orient the surgeons performing angiography, coronary bypass, and flaps in reconstructive surgeries. **Keywords:** Axillary Artery, Thoraco acromial Artery, Subscapular Artery

Variation in formation of superficial palmar arch and its clinical implications

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ABSTRACT

Background: Hand is highly vascular which is medically and surgically very complex and important. Superficial palmar arch is mainly formed by the contribution of the radial artery and some contribution from the ulnar artery, in some of the cases medial artery anastomose to form arch. The aim of this research was to see how SPA and its size changed in adult homosapiens over time. An analysis of the literature highlights the clinical consequences of these variable palmar arches. **Methods:** In this study 50 cadaveric specimens are used for the research which are dissected, coloured

and photographed. In diameters in this analysis are not precise because I used manual methods such as nylon thread and a metal mini scale. **Results:** SPA was found complete in 37 of them (74 percent), the various Complete Forms of SPA Patterns observed in this study. Measurements of radial artery is 1.49mm, and ulnar artery is 1.55mm. **Conclusion:** According to the results, most hands had a full arch, implying that in the vast majority of cases, collateral circulation exists. In the case of RA harvesting for CABG, this will result in complications.

Keywords: Superficial palmar arch, radial artery, ulnar artery, variations, vascularity, coronary bypass surgery

Prevalence of fetal variant of Circle of Willis: A cadaveric study

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Institute/ Organization name: ?

ABSTRACT

Background: Normally the posterior cerebral artery (PCA) is a terminal branch of basilar artery and establishes the posterior circulation of brain. The fetal type of PCA (FPCA), either the P2 segment of PCA directly arises from Internal carotid artery (ICA) or the P1 segment of PCA is hypoplastic and P2 segment receives blood from ICA. Hypoplasia/Aplasia of these arteries are responsible for aneurysm and ischemic stroke. In presence of FPCA, thrombo embolism in anterior circulation may result in infarction in posterior circulation too. Therefore, knowledge of variations in length and diameter of PCA is of immense significance for surgical interventions. **Methods:** We studied 40 posterior cerebral arteries from 20 formalin-fixed brains. We observed the length of the P1-segment and P2-segment; outer-diameter at the point of origin of P1, P2 and PCOM and accordingly classified them into adult, partial fetal type or complete fetal type circle of Willis. **Results:** Mean length of P1-segment was 8.05±1.90 mm (right) and 8.71±1.98 mm (left); P2-segment was 26.35±4.07 mm (right) and 25.79±4.26 mm (left); outer-diameter of P1 was 2.25±0.51 mm, P2 was 2.09±0.37mm and PCOM was 1.27±0.59mm. Hypoplasia of P1 segment was observed in 2.5% cases (left sided). In 12.5% cases the diameter of P1 segment was less than that of P Com. Adult configuration of PCA was observed in 87.5% cases, Complete fetal type in 2.5% and partial in 10%. Bilateral FPCA was found in 5% cases and unilateral in 15% cases. **Conclusion:** Knowledge of variations will help in avoiding diagnostic pitfalls and the morphometry of PCA is key to successful thrombectomy.

Keywords: Posterior cerebral artery, circle of Willis, variations.

Study of Variation in the Length of Menisco-Femoral Ligament in North Indian Population

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ABSTRACT

Background: Menisco-femoral ligament was first discovered by Poirier and Charpy but defined it as 3rd cruciate ligament. It connects fibro-cartilagenous menisci of the knee to the intercondylar area of femur. Menisco-femoral ligament are two ligaments that connect posterior horn of lateral meniscus to the lateral aspect of medial femoral condyle. One of these passes anterior to posterior cruciate ligament and is known as ligament of Humphry or anterior menisco-femoral ligament. Other passes posterior to posterior cruciate ligament and is known as ligament of Wrisberg or posterior menisco-femoral ligament. **Methods:** Present study was conducted in department of Anatomy in PGIMS Rohtak on 50 human cadaveric knee joint, in which length of this ligament was measured in two age group (20-40 and 41-60) using vernier caliper. **Results:** Mean length was measured in two age group and then the results were compared which showed decrease in the length of the ligament in older age group which was statistically significant. **Conclusion:** length of the menisco-femoral ligament decreases with increasing age, hence it is a regressive structure.

Keyword: Menisco-femoral ligament, knee joint, lateral meniscus.

Variation in Formation of Brachial Plexus Cords

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ABSTRACT

Background: Variations of the brachial plexus are common and a better awareness of the variations is of crucial importance to achieve successful results in its surgical procedures. The brachial plexus has a complex anatomical structure and its close relationship to important anatomical structures is what makes it an easy target for iatrogenic injury. **Method:** The aim of the present study was to observe anatomical variations information of the brachial plexus. Dissection of 64 limbs of 32 human adult embalmed cadavers was carried out in the department of Anatomy, Grant Government Medical College and variations were documented. **Results:** The variation observed was that the middle and lower trunks of Brachial plexus join to form a common trunk which then give rise to medial cord and posterior cord. The formation of the common trunk was observed in the supraclavicular as well as infraclavicular parts of Brachial plexus. **Conclusion:** The present study demonstrated the variations in the formation of Brachial plexus; knowledge of these is important to anatomists, radiologists, anesthesiologists and surgeons. It is also concluded that although these variations may not have affected the functioning of upper limb in the individual, knowledge of such variations is essential in evaluation of unexplained sensory and motor loss after trauma and surgical interventions to the upper limb.
Keywords: Brachial plexus, variation, trunk

Variations in Formation of Median Nerve

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ABSTRACT

Background: Formation, distribution and possible communications of the median nerve are essential to know in surgical management of various conditions or injuries of the axilla and upper arm. These variations could result in pressure or postural occlusion of the axillary artery as well as iatrogenic injury to the Median nerve during axillary lymph node dissection, presenting as unexplained weakness of forearm flexors and thenar muscles. **Methods:** This study was carried out with the objective of documenting multiple occurrences of variations in the formation of the Median Nerve. In the present study, 64 upper limbs, belonging to 32 adult human cadavers, were dissected in the dissection hall of the Department of Anatomy, Grant GMC, Mumbai. The roots forming the median nerve, their relation with the axillary artery and communications with other nerves were noted. **Results:** Union of the medial & lateral roots of Median Nerve occurred distal to the third part of the axillary artery in multiple cadaveric axillary dissections. One of the lowest or most distal formation of the Median nerve was seen to occur just above the level of the radial groove of the humerus. Other variations found include communications with surrounding nerves. **Conclusion:** The present study demonstrated the variability in the formation of the Median nerve in the axilla, providing crucial information to surgeons, radiologists and anaesthesiologists when approaching the axilla for operative procedures, nerve block or radiotherapy.
Keywords: Median nerve, Low formation, brachial plexus, axillary dissection

Reporting the Rarest Occipital Bone Anomalies- is it a Reflection of Neanderthal Trait?

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ABSTRACT

Background: Variant anatomy of occipital bone is rare. Alteration from the normal segmentation and separation of the most caudal occipital sclerotome and the first cervical sclerotome during the first few weeks of intrauterine life leads to abnormalities. Crucial

structures around the foramen magnum and at suboccipital triangle are prone to compression and injury leading to severe unexplained pain or vertigo or neurological deficits encountered in craniovertebral junction abnormalities. **Methods:** On examination of occipital bones of 48 skulls from the department of anatomy, two skulls were found to show peculiar features. Photographs were taken and compared with normal skull. **Results:** One skull exhibited a prominent occipital bun measuring 2.8 x 1.4cm at the external occipital protuberance. Occipital bun or knob, sloping forehead, suprainiac fossa, midsagittal, maxillary, mandibular prognathism, flat basicranium, retromolar space and large mental foramen are the features of Neanderthal trait. This skull has been examined for all these characteristics. The basiocciput of another skull was found to show bilateral projections measuring 1cm each, adjacent to foramen magnum. Occipitalisation of atlas or incomplete occipital vertebra might be the cause. Dimensions of foramen magnum have been measured. Interesting facts and further details will be presented at the conference. **Conclusion:** Application of variations in the basic sciences clinically fulfils the vision of competency based medical education. Developmental anomalies the occipital bone could be the differential diagnosis of unexplained neck pain. Occipital knob or incomplete cervical vertebra could be a rare cause of craniovertebral junction abnormalities that are congenital or acquired.

Keywords: Occipital knob, incomplete occipital vertebra, Neanderthal trait, craniovertebral junction anomalies.

A Study of Anatomical Variations in Patterns of Fissures and Lobes in Human Lungs

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ABSTRACT

Background: Knowledge of anatomical variations in lung morphology is not only of academic interest but is essential during surgery and also while interpreting various radiological images. The present study was undertaken with the aim to observe the variations of lung morphology. **Methods:** A total of 33 lungs in dissection room of R.N.T Medical College were examined. The shape of the lungs, variations of fissures and lobes were studied in 16 right and 17 left isolated lungs. **Results:** Among the right lungs, oblique fissure was incomplete in 37.50% and absent in 18.75% and horizontal fissure was incomplete in 56.25% and absent in 18.75%. Inferior accessory fissure (IAF) was present in 12.50% and superior accessory fissure (SAF) in 6.25%. Among the left lungs, oblique fissure was incomplete in 64.70% and absent in 11.76%. Horizontal fissure was present in 0.0%, left minor fissure (LMF) in 23.52%, inferior accessory fissure (IAF) in 5.88% and superior accessory fissure (SAF) in 5.88%. **Conclusion:** The knowledge of variations in the lung morphology observed in this study will be of academic interest and also useful for diagnostic and clinical management of pulmonary and even cardiac cases.
Keywords: Fissure, Lobe, Accessory Fissure, Accessory Lobe

A Study of Variation in the Branching Pattern of Femoral Artery

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ABSTRACT

Background: Femoral artery is commonly utilized for angiographies, insertion of central lines, ultrasound & Doppler imaging, digital subtraction angiography, magnetic resonance imaging and other various investigative and diagnostic procedures. Accurate knowledge of anatomical variations regarding origins of the profundafemoris, medial and lateral femoral circumflex arteries are important for clinicians in the present modern era of interventional radiology. **Methods:** The study of femoral artery and its branching patterns was done on 24 embalmed and formalin fixed limbs (12 cadavers) by dissection method. **Result:** It was observed that profundafemoris artery, largest branch of femoral artery arises from posterolateral aspect in

majority of the cadavers and in 41% of cases it is originating at a distance of 3-4 mm from mid-inguinal point. Lateral circumflex femoral artery originates from femoral artery in nearly 20% of the cadavers. **Conclusion:** The sound anatomical knowledge of femoral artery and its branches is important while performing clinical procedures in the femoral region and hip joint replacement and also for avoiding iatrogenic arterio-venous fistula or severe secondary haemorrhage while performing femoral artery puncture. This study will be very helpful to the surgeons, radiologist and plastic surgeons to understand possible variations.

Keywords: Circumflex, Interventional, Cannulation, Ontogeny, Phylogeny.

Study of Median Nerve and its Variations in Human Adult Cadavers.

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ABSTRACT

Background: The median nerve is one of three major nerves of forearm and hand, formed by the union of medial root and lateral roots. The lateral root is continuation of lateral cord and conveys the fibres from C5, C6 & C7 and the medial root is derived from the medial cord and conveys the fibres from C8 & T1. The median nerve susceptible to variations and communications between the nerves and its adjacent nerves common. Variations of the median nerve are frequently encountered and knowledge of these variations is essential to perform corrective surgeries in the entrapment neuropathies. **Methods:** The present study has been carried out variations in formation, course, relations and branching pattern of median nerve in 40 formalin fixed upper limbs of 20 human adult cadavers. The present study has been conducted in 40 formalin fixed upper limbs of 20 human adult cadavers during routine dissection of first year MBBS students for a period of two years, department of anatomy, Andhra Medical College, Visakhapatnam, Andhra Pradesh. **Results:** In the present study 40 upper limbs of 20 adult human cadavers dissected & observed. Each limb is considered as one specimen. Variations in the course and relations of median nerve detected in 2% of specimens as a median nerve present medial to the axillary artery in axilla. 1% of specimen showed abnormal communicating branch between median nerve and musculo cutaneous nerve in the axilla. **Conclusions:** In the present study 40 formalin fixed upper limbs of 20 adult cadavers were dissected & observed for the anatomy, course, branches and distributing pattern of the median nerve from its formation to termination.

Key words: Median nerve, cadavers, dissection

Morphological Variants of the Human Spleen, A Cadaveric Study

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ABSTRACT

Background: The aim of the present study was to study the anatomical variations of spleen in South Indian population. **Methods:** This study included 126 adult human embalmed spleens, which were available at the department of anatomy. The cadaveric spleens were macroscopically observed for the various shapes, notches and the fissures. The length, breadth and thickness of the spleen was also determined. **Results:** It was observed that 99 spleens (78.6%) revealed notches either in the superior or inferior border. The notches were absent in 27 (21.4%) spleen specimens. The notches were rarely observed in the inferior border and found only in 16 (12.7%) cases. The fissures on the diaphragmatic surface were observed in 18 spleens (14.3%). The length, breadth and thickness of the spleens ranged from 9 to 27 cms, 6.1 to 15.7 cms and 1.3 to 6.1 cms respectively. **Conclusion:** This study has provided information about the dimensions of spleen and anatomical variations, which are enlightening to the operating surgeon. The knowledge is important during the procedures like

laparotomy, laparoscopy and robotic platforms. The details are essential to the radiologists during their diagnostic procedures and it will prevent the misinterpretation.

Keywords: Fissure, morphology, notch, variant

Are the Fathers of Children with Special Needs More Stressed than the Mothers of Normal Children? "A Virtual Online Survey"

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ABSTRACT

Background: Stress is defined as "a negative emotional experience accompanied by predictable biochemical, physiological, cognitive, and behavioural changes that are directed either towards altering the stressful event or accommodating to its effects". According to the 2019 "State of the Education Report for India: Children with Disabilities" there are 78,64,636 children with disability. Special needs is a term used in clinical diagnostic and functional development to describe individuals who require assistance for disabilities that may be medical, mental, or psychological. There are four major types: 1. Physical- muscular dystrophy, multiple sclerosis, epilepsy, etc. 2. Developmental-down syndrome, autism, dyslexia, etc. 3. Behavioural/Emotional -ADHD, bi-polar, etc. 4. Sensory Impaired-Blind, deaf, etc. The objective of the study is to compare stress of parenting among fathers of children with special needs and mothers of normal children. **Methods:** Sheldon Cohen Perceived Stress Scale questionnaire was used to assess parenting stress on father of 120 children with special needs (study group) and mothers of 120 normal (control group) children aged between 6 and 12 years. Statistical analysis was done using Unpaired t-test. **Results:** The study group scored higher as compared to the control group with their means and standard deviations being (18.60±4.77) and (15.78±5.06) respectively. The statistical value of significance (p value) is 0.03. **Conclusion:** The fathers of children with special needs had significantly higher parenting stress, as they are required to deal with an alteration in the family dynamics with modification of their activities and increased burden of caring for a child who cannot adequately care for itself, their child's future potential, prognosis, and financial burden to fulfil their needs. Even though the mothers of normal children are stressed by the parenting, it is acknowledged that parents of children with disability experience high levels of stress and is associated with a wide range of variables.

Keywords: Stress, parenting, special needs.

Cadaver as the First Silent Medical Teacher: Exploring Bioethical Perceptions of Department of Anatomy

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ABSTRACT

Background: Department of Anatomy with its time honored and integral essence, human cadaveric dissection has been trying to serve the medical profession since the inception of medicine. Every human cadaver who goes under the knife of medical student during Anatomical dissection deserves special treatment and utmost respect. But unfortunately, probably the bioethical sentiments of the body donor and the human cadaver have been noted to become extinct from Medical profession, until recently with the introduction of the new competency based Medical education in India. The present study attempts to dig out the noble practices followed in various Medical schools to ensure the human cadaver gets the rightful respect and dignity. Our literature review reflects the practice of students' conduct and habits on the first day of dissection. We emphasize guidelines that may be sincerely recommended to Medical schools to ensure honor towards the human cadavers. **Methods:** The psycho-social attitudes of MBBS students has been attempted to learn by distributing questionnaire to the 2019 batch MBBS students (n = 60) of Late Shri Lakhiram Agrawal Memorial Government Medical College Raigarh (CG)

during the foundation course (first 1 month of 1st year curriculum) and on their first encounter with the cadaver. **Results:** 95.4% and 57.5% of students showed positive and negative perceptions. The religious beliefs and emotional attachments with the cadaver were noted to be as 20% and 63% respectively. The sentiments included cognitive, affective, moral and behavioral. **Conclusion:** The article attempts to focus the noble endeavor of the departed soul, as the first medical teacher, who wishes to enlighten the pure minds of medical students with empathy towards their patients. Based on the emotional observations made from the medical students on their first encounter with the cadaver, the present study anatomizes science and humanity with care, compassion and dignity. **Key words:** Cadaver, bioethical, dissection, medical teacher.

Learning Gross Anatomy using the Dissection Module: Benefits & Pitfalls

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ABSTRACT

Background: Teaching anatomy has been centered on dissection for centuries. For generations the use of cadavers has been the chief pillar for learning Anatomy. However, the limited availability of cadavers, the difficulties imposed by the ethical issues for their use, among other arguments, have led to use of substitute such as prosection, anatomical models, artificial organs and audio-visual aids. Therefore, in light of these changes, we ask, is dissection the *only* option? Or are there other options which students can undertake to develop anatomical knowledge? **Methods:** The study was conducted on 145 first year MBBS students of Kasturba Medical College Manipal using a questionnaire. It comprised of points relating to the advantages and disadvantages of learning Anatomy by self-dissection, dissection classes versus other educational resources used in learning Anatomy. Results were expressed in frequency & percentage. **Results & discussion:** 66.4% students agreed saying dissection provides three-dimensional perspective of structures. 55% felt it is time consuming and the smell of formalin is unpleasant. 46% felt prosection (Pre-dissected specimens) helped them to get to the important information quicker without spending extra time on dissection. But when asked whether dissection should be removed from the curriculum, majority (62.2%) strongly disagreed. However, it was agreed that dissection should be supported by other educational modules (i.e. plastinated specimens, video demonstrations, dissected specimens etc) (52%). **Conclusion:** The study strengthens the belief of using dissection for better Anatomy learning and glorifies that dissection hall teaching would be the best approach for anatomy teaching and learning.

Key words: Gross Anatomy, Dissection, Learning, Teaching, Students

Clinical and Embryological Study of Midgut Volvulus – A Case Report

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ABSTRACT

Background: Midgut volvulus is a condition in which the intestine has become twisted as a result of malrotation of the intestine during fetal development. Malrotation of the intestine occurs when the normal embryologic sequence of bowel development and fixation is interrupted. **Methods:** A seven year old female child was brought to the OPD of a tertiary care hospital with a history of pain in abdomen and vomiting off and on since one month. Pre-op CT scan showed features suggestive of mid gut volvulus. Exploratory laparotomy with evaluation of volvulus and correction with Ladd procedure was done. **Results:** Findings during the exploratory laparotomy were intestinal malrotation with midgut volvulus, Ladd bands, duodenal dilatation, interbowel adhesion to mesentery and dilated vessels. **Conclusion:** Malrotation of the bowel causes shortening of

the mesenteric root, which predisposes to volvulus. Malrotation results from disruption of the normal embryologic development of the bowel. In this poster we discuss the clinical presentation and embryological basis of this case of malrotation of the gut with midgut volvulus.

Keywords: Malrotation, midgut volvulus, CT scan, exploratory laparotomy, Ladd procedure

Situs Inversus Totalis

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ABSTRACT

Background: Situs inversus is a congenital anomaly of positioning of internal viscera characterized by transposition of abdominal viscera and if associated with right sided heart called as situs inversus totalis, occurring in approximately 1/10000 live births. Rare condition with genetic predisposition, etiology lies in the mutation of chromosome number 12. **Methods:** A full term male baby, still born at the Institute of Maternal and Child health, Government Medical College Calicut was handed over to the Department of Anatomy, Medical College, Calicut, for research purposes after obtaining consent from the parents. The cause of death was unknown. The body was embalmed and dissected during a study on extra hepatic biliary system in individuals of different age groups and sex. **Results:** On dissection, the liver and gall bladder were found in the left hypochondrium, spleen in the right hypochondrium, stomach, duodenum, parts of intestine in the reversed position, the caecum and appendix in the left iliac fossa, also reversal in the position of abdominal aorta and inferior vena cava. There was dextrocardia, reversal of great vessels, the left lung was trilobed and the right lung bilobed, the left dome of diaphragm was noted at a higher position. **Conclusion:** Situs inversus is a rare congenital condition which affects all major organs in the thorax and the abdomen. Usually, people with situs inversus lead a normal healthy, with no phenotypical impairment, unaware of their unusual anatomy.

Keywords: Situs inversus totalis, Dextrocardia, congenital anomaly

Foetal Cloacal Exstrophy

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ABSTRACT

Background: Cloacal exstrophy is a rare and complicated condition that affects the lower abdominal wall structures of infant in-utero, occurring in 200,000 pregnancies and 400,000 live births. It is often diagnosed prenatally by a foetal ultrasound and confirmed at the time of birth. It is a severe birth defect in which there is usually a membrane-covered area on the abdominal wall that contains abdominal contents. **Methods:** A multigravida of gestational age 21 weeks was referred from outside hospital to a tertiary care centre following an abnormal foetal anomaly scan. A repeat ultrasound was carried out at Government Medical College Kozhikode which revealed the foetus had multiple anomalies. The patient and family were counselled regarding the likelihood of a very poor prognosis and they elected to terminate the pregnancy. The aborted foetus was examined. **Results:** Ultrasonography revealed a foetus of ambiguous genitalia with omphalocele, cloacal exstrophy, absent anal sphincter, ectopic left kidney and a single umbilical artery. The urinary bladder was not visualised. It was noted that the right foot was persistently dorsiflexed. On external examination, ventral abdominal wall was found defective with an omphalocele. Also ambiguous genitalia, cloacal exstrophy, imperforate anus and right rocker bottom foot of the foetus was noted. **Conclusion:** Cloacal exstrophy is a complex and rare congenital malformation. Despite medical efforts and development in treatment and support, satisfaction in outcome of cloacal exstrophy still remains a challenge.

Keywords: Cloacal Exstrophy, Congenital malformations, Omphalocele, Prenatal diagnosis

Congenital Cystic Adenomatoid Malformation of the Lung: Embryological Review

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ABSTRACT

Background: Congenital Cystic Adenomatoid Malformation (CCAM) is relatively rare developmental dysplastic lesion which affects fetal bronchial tree. Etiopathogenesis is still poorly understood. Case presentation: We report a case of rare congenital anomaly of lungs observed during fetal autopsy. A 30 year old female presented to obstetric out patient department for regular consultation at 24 weeks of gestation. Routine antenatal ultrasonography revealed multiple echolucent cysts in the right lung of the fetus along with ventriculomegaly and ascites. Left lung was normal. **Methods:** Fetus along with attached umbilical cord and placenta received for autopsy. Autopsy was performed using standard protocols. After thorough external examination, "I" shaped incision was taken and en bloc dissection done. Internal examination for gross organ anomaly was followed by sectioning of each organ for histopathological examination. **Result:** Histopathological study of right lung showed distortion of parenchyma with dilated bronchioles. Multiple cysts observed lined by columnar epithelium along with loose intervening connective tissue along with many congested and dilated blood vessels. Other tissues does not show any remarkable changes. **Conclusion:** Lung pathology being common cause of fetal deaths, knowledge of congenital anomalies of respiratory system would help clinicians to plan the management at very early stage. Accurate fetal autopsy along with clinical data are important in evaluating fetal deaths and can help in reduction of unexplained stillbirths.

Key words: Adenomatous, Congenital, Cytic, Embryology, Fetal autopsy, Lungs, Malformatio

Sirenomelia

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ABSTRACT

Background: Sirenomelia is a rare congenital abnormality with characteristic features of complete or partial fusion of lower limbs. It is also called mermaid syndrome. This syndrome is incompatible with life due to the association of several congenital visceral abnormalities. The prevalence of this syndrome is 0.1-0.25:10000 in normal pregnancies and strongly associated with maternal diabetes. **Methods:** A 32 year old multigravida of gestational age 20 weeks with uncontrolled diabetes mellitus was referred from peripherals to a tertiary care centre following an abnormal foetal anomaly scan. A repeat ultrasound was carried out at Government Medical College Kozhikode which revealed the foetus had multiple anomalies including caudal dysgenesis having fusion of lower limbs. There was no identifiable external genitalia and anus. The patient and family were counselled regarding the poor prognosis and risk factors and they elected to terminate the pregnancy, the foetus handed over to Anatomy museum. **Results:** Narrow chest indicating lung hypoplasia, fused both lower limbs, absence of external genitalia, imperforate anus and single umbilical artery were noted. **Conclusion:** Sirenomelia is a rare and lethal abnormality. When it is diagnosed antenatally, termination should be offered. Regular antenatal checkup with maternal blood glucose level in preconceptional period and antenatal period and the ultrasound should be maintained to prevent this anomaly.

Keywords: Sirenomelia, Mermaid syndrome, Maternal diabetes

A Case Report of Transverse Limb Defect

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ABSTRACT

Background: Transverse limb defect a relatively rare problem with incidence of 3.5-6.9/10000 births and low prenatal detection rate. It

is defined as partial or complete absence of a part of one or more fetal limbs, leaving a stump. This case report is an isolated transverse limb defect, detected at 13 weeks GA. **Case Report:** A 24 years primigravida was referred to our college hospital for second opinion with impression of non visualization of upper limbs at 13 weeks GA. Her Antenatal ultrasound showed fetal biometry consistent with 13 weeks, placenta, liquor was normal. Bilateral transverse limb defect involving upper limbs with absent forearms and hands was noted. No h/o exposures to drugs/toxic substances. Causes are believed to be secondary to vascular insult in early embryonic life or due to amniotic bands or by ingestion of teratogenous or vaso spastic drugs. **Conclusion:** Early detection by demonstration of four limbs with three segments by standard trans abdominal and transvaginal ultrasound procedure and termination at earlier GA reduce physical and emotional morbidity of mother and prevent delivery of anomalous fetus. This case report may help us to gain knowledge of limb defects and will be useful for radiologists, obstetricians and for medical students.

Keywords: Transverse limb defect, prenatal, transvaginal ultrasound, termination of pregnancy.

Online Survey of Parenting Stress between Parents of Children with Special Needs and those with Normal Children

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ABSTRACT

Background: Parenting is the process of promoting and supporting the physical, emotional, social, and intellectual development of a child from infancy to adulthood. "Parenting stress" as stress that is felt in response to the demands of being a parent-stress that is often experienced as negative feelings toward the self and toward the child or children. Parenting is a major form of stress, especially in children with special needs. Special needs are chronic conditions of disability, may be medical, psychological or emotional. It makes extra demands on parents, resulting in stress. The objective of the study is to evaluate parenting stress among parents (mother & father) of children with special needs and normal children. **Methods:** Parenting stress was assessed using Sheldon Cohen Perceived Stress Scale questionnaire on Parents of 100 special needs [study group] and 100 normal [control group] children aged between 5 and 12 years. The Questionnaire was provided to both parents, they were seated separately in order to avoid bias. Statistical analysis was done using Unpaired t-test. **Results:** The study group scored higher as compared to the control group with their means and standard deviations being (18.914± 5.24) and (16.12±4.18) respectively. The statistical value of significance (p value) is 0.0009. **Conclusion:** The parents of special children had significantly higher parenting stress levels as compared to the parents of normal children. It is important to address this stress as it could lead to impairments of overall quality of life in both parents and their child or children. The addition of a disabled child to a family requires parents to adopt new roles and responsibilities and, in turn, creates a change in the function of the family system. Indeed, disabled children often demand more effort in daily activities and social integration than non-disabled children.

Keywords: Parenting, disability, stress.

Metopism – A Case Report

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ABSTRACT

Background: Frontal bone of human skull develops in two halves, united together by a frontal or metopic suture. The metopic suture is a dense fibrous joint extending from the nasion to bregma. Normally metopic suture disappears between 1-10 years of age by ossification. Persistence of metopic suture throughout life is called as Metopism. **Case Report:** An adult male skull having persistent metopic suture was found in our osteology collection. The suture is

11.5 cms in length, extending from nasion to bregma. It is a linear and complete suture of dentate type, anteriorly meeting the suture between two nasal bones and posteriorly meeting the coronal suture 0.5 cms to the left of midline. The supraorbital foramen and superciliary arch are present and normal on both sides. **Conclusion:** Knowledge of Metopic suture is important for forensic experts, neurosurgeons, radiologists etc. since a persistent metopic suture may be misinterpreted as a vertical fissure fracture of skull. Early closure of metopic suture may lead to narrow elongated skull called trigonocephaly. Metopism may also be associated with frontal sinus irregularities like frontal sinus agenesis, aplasia, hyperplasia etc.

Keywords: Metopic suture, Frontal bone, Nasion, Bregma, Persistent frontal suture

Foramen Ovale- Morphometric & Morphological Assessment in Human Adult Neurocranium

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ABSTRACT

Background: Foramen ovale (FO) is present in the greater wing of sphenoid bone which transmits Mandibular nerve, Lesser petrosal nerve, Accessory meningeal artery and the emissary veins. The FO provides access to Trigeminal nerve hence it is important in functional cranial anatomy and neurosurgeries. **Methods:** Study was carried out in 200 crania (unknown sex) of Indian origin. Differences in Shape of the foramen were noted & Digital vernier callipers is utilised to appreciate Anteroposterior & mediolateral diameters of both sides from which Areas were obtained & evaluated statistically. **Results:** The classic shape of the foramen ovale in majority of the crania is OVAL 53% and 54% followed by ALMOND in 13% & 12%, ROUND in 11% & 12% on right and left sides respectively. Bony outgrowths were noticed. Mean Dimensions for the right side (APD, TD & AREA) were 6.68+1.58mm, 4.07+0.82mm, 21.22+ 6.05mm and the left side were 6.15+1.32mm, 3.86+ 0.74mm, 18.71+5.04mm respectively. **Conclusion:** Anatomical familiarity of foramen ovale is crucial, as various diagnostic and invasive surgical approaches are handled via foramen ovale including biopsy of the deep lesions (that would otherwise require craniotomy or open surgical biopsy having high risk of morbidity). Consequently The present study was worthwhile with regard to diagnostic & surgical significance of foramen ovale.

Keywords: Cranium, Foramen Ovale, Morphology & Morphometry

Anatomical Study of Foramen Magnum in Dried Human Skull Bones

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ABSTRACT

Background: The Foramen Magnum is communication between vertebral canal and posterior cranial fossa and important landmark to key structures such as brain, spinal cord, vertebral arteries. Anatomical knowledge of the foramen magnum is significant for understanding the pathophysiology of various disorders of the craniovertebral junction as well as for planning surgical procedures. **Methods:** The study was conducted on 62 dry skulls of unknown gender obtained from the Department of Anatomy. The shape of foramen magnum was classified as oval, round, tetragonal, pentagonal, hexagonal and irregular in shape and measurements like antero-posterior diameter and transverse diameter of foramen magnum were taken using the Digital Vernier sliding caliper. **Results:** In the present study most common shape was oval in 22 (35.48%) skulls, followed by Egg shape in 12 (19.35%) skulls and least common pentagonal shape in 1 (1.61%) skulls. In our study the mean anteroposterior diameter was 34.17 mm. and mean transverse diameter was observed to be 28.86mm. **Conclusion:** Results of our present study may help in

neurosurgeons, orthopedicians, radiologist and anesthetist in North West Indian population.

Keywords: Foramen magnum, skull, transverse diameter, oval.

Superficial Ulnar Artery and its Associated Variations in Cubital Fossa

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ABSTRACT

Background: Arterial variations though common, they must not be neglected and should be emphasized during academic teaching. Ulnar artery is large terminal branches of brachial artery which arises 1cm below the intercondylar line. It normally courses deep to the superficial flexors in the front of forearm. The superficial course of this artery may confuse and complicate the therapeutic procedures. **Methods:** During the routine dissection of 60 yr old male cadaver for undergraduate students of medicine, we noticed the presence of superficial ulnar artery which originated at the level of intercondylar line. The connective tissue around the vascular structures was well separated to look for variations in branching pattern of brachial artery in cubital fossa. The dissection procedure was followed as per Cunningham manual guidelines. **Results:** The superficial ulnar artery coursed superficial to superficial muscles in front of forearm, but deep to antebrachial fascia. However the brachial artery in cubital fossa bifurcated to give radial artery and common interosseous artery. The common interosseous artery gave two ulnar recurrent, one anterior interosseous and one posterior interosseous artery. The radial artery gave the radial recurrent artery. However the relations of brachial artery with other contents in cubital fossa remained undisturbed. **Conclusion:** The subtle knowledge regarding these unique kinds of variation in the blood vessels is very essential. The patterns of variations should keep in mind by the clinicians and radiologists in their daily diagnostic and therapeutic procedures.

Keywords: Brachial artery, superficial ulnar artery.

Unforeseen Bifurcation of Common Carotid Artery and Atypical Branching Pattern of External Carotid Artery- A Case Report

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ABSTRACT

Background: Carotid arterial system serves as the sole vascular supply to head and neck structure including the brain. Variations and uniqueness in their branching patterns and origin are to be reported as they are encountered in surgical procedures of the neck. **Methods:** 55-year-old male cadaver presented left external carotid artery in carotid triangle with unusual branching pattern. However, the point of origin of external carotid artery/ bifurcation of common carotid artery was not located in the triangle. Therefore, the triangle was dissected and the vessels were traced to locate the level of origins of both external and internal carotid arteries and to note the bifurcation of common carotid artery. The length of the artery from origin to the point of bifurcation was measured using vernier calliper. The length and width of both external and internal carotid arteries were also measured. Variations in branches of external carotid artery was also noted. **Results:** The left Common carotid artery was located and traced in the proximal aspect of neck, below carotid triangle. It bifurcated into external and internal carotid artery at the level of lower pole of the thyroid gland, 1cm above the sternoclavicular joint. The common carotid artery measured 4.8cm long. Both external and internal carotid arteries shared same length from the point of origin to the tendon of posterior belly of digastric (the highest visible point in the neck). However, one of the branches of common carotid artery was narrower than the other. The upper pole of thyroid gland received dual Superior thyroid arteries both from the external carotid artery, of which the distal artery also supplied larynx by giving off superior laryngeal artery. **Conclusion:** Though the variations of carotid arteries are commonly reported,

lower level of bifurcation in common carotid artery is unusual. Reporting these variations in carotid arterial system would help in preventing the injury of vessels during the surgical procedures.

Keywords: Carotid artery, Variation, Bifurcation, Surgery

The Dead Telltales – Truth by the Tooth

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Institute/ Organization name: ?

ABSTRACT

Background: Forensic Odontology is a rapidly developing branch of Forensic Medicine and Forensic Sciences. The Federation Dentaire Internationale defines Forensic Odontology as that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence and with the proper evaluation and presentation of dental findings. Dental tissue is often preserved indefinitely after death and can even withstand a temperature of 1600°C when heated, without appreciable loss of microstructure. Odontological identification is based on the systemic comparison of pre and post mortem dental characteristics based on dental records and supporting radiographs, but this technique is complicated by trauma and inadequate ante-mortem dental information. Broadly, Forensic Odontology aids DNA analysis, age estimation, sex determination and determination of the species while Cheiloscopy and Rugoscopy are forensic investigations that deal with human identification based on lip traces and palatal rugae respectively. **Methods:** Standard textbooks and E-journals from several databases were researched, and the most relevant articles were chosen for this review E-poster. **Conclusion:** Forensic Odontology is an upcoming branch of Forensic Medicine which is yet to gain awareness in India. This E-poster highlights its importance and the role it plays in assisting legal authorities in medico legal identification by examination of dental evidence.

Keywords: Forensic odontology, DNA Analysis, human identification

Branches of Cords of Brachial Plexus lateral to Axillary artery

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ABSTRACT

Background: Cords of Brachial plexus are defined as lateral, medial and posterior based on their relationship with second part of the axillary artery and the outcome (branches) of these cords maintain almost similar relation with the third part of axillary artery. Though formative variations such as prefixed and postfixed are well described, studies on relationship with axillary artery are meagre. This knowledge of relation of cords of Brachial Plexus and its branches with axillary artery is important for surgical interventions and selective nerve block. **Methods & Results:** During the routine dissection of axillary region of male cadaver in Anatomy department of GFIMS Faridabad we observed cords and branches of Brachial plexus were lateral to axillary artery. This positional variation is rarely reported. Satyanarayana et al (2009) also noted all three cords of brachial plexus were lateral to all three parts of axillary artery. Median nerve was lateral to brachial artery and ulnar nerve was between the brachial artery and median nerve. Jamuna M. (2011) also observed similar variation during routine dissection of male cadaver. Eranga and Samarawickrama (2020) observed cords of brachial plexus and their branches were lateral to Axillary Artery. **Conclusion:** Cords and branches of brachial plexus may show variable relation with the axillary artery and these variations are important during invasive procedures as well as radiology of axillary region.

Keywords: Lateral cord, Medial cord, Posterior cord, Axillary artery, Brachial Plexus.

Bicipital Groove of Humerus –A Morphometric Study

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ABSTRACT

Background: Bicipital groove (BG) is an indentation between the greater and lesser tubercles on the proximal part of humerus. It conveys the bicipital tendon with its synovial sheath and the ascending branch of anterior circumflex humeral artery. BG is an important landmark for placement of lateral fin of prosthesis in shoulder arthroplasty and in humeral head replacement in fracture of upper end of humerus. **Methods:** This observational study was conducted in 58 unpaired dry adult human humeri of unknown sex and age obtained from the Department of Anatomy, Goa Medical College. Parameters were measured using a digital vernier calliper. **Results:** Average width of bicipital groove on right side is 9.37mm with a S.D of 1.6mm and range of 6.7-12.46mm while the average width of bicipital groove on left side is 9.06mm with a S.D of 1.59mm and range of 5.7-12.1mm. **Conclusion:** Variant morphometry of bicipital groove is reported to be associated with pathologies of bicipital tendon and subluxation of shoulder joint. The morphometry is likely to be influenced by nature of manual work of a person. Knowledge about bicipital groove will be of paramount importance for the anatomist, radiologist, surgeons in carrying out surgeries on shoulder joint and for physicians in management of anterior shoulder pain.

Keywords: Humerus, Bicipital groove, Morphometry.

Unilateral High Division of Sciatic Nerve in Human Adult Cadaver

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ABSTRACT

Background: The sciatic nerve is the largest and widest nerve in the body and is derived from ventral rami of spinal nerves L2 to S3. Sciatic nerve appears in the Gluteal region below Piriformis from Pelvic cavity by passing through Greater Sciatic foramen. In between the Ischial tuberosity and greater trochanter of Femur, it reaches the back of the thigh. At the superior angle of Popliteal fossa, it divides into Tibial and common Peroneal (fibular) nerves. The division varies, and it may occur within the pelvis, Gluteal, upper, mid and lower part of thigh. **Methods:** The present study has been carried out in 8 human cadavers (16 lower limbs) and finding of variations in level of bifurcation of sciatic nerve in one lower limb. On routine dissection of MBBS students of Department of Anatomy, Andhra Medical College Visakhapatnam, Andhra Pradesh. One of the adult cadaver, showed variations in the level of bifurcation of sciatic nerve in one lower limb. Variations were observed and photographed. **Results:** We observed the variations in the level of bifurcation in one lower limb which will be discussed later in the conference. **Conclusion:** The findings of this study revealed that the majority of sciatic nerve divisions occur at the superior angle of popliteal fossa while some divided into other regions such as Pelvis, Gluteal and thigh regions. The anatomical variations of the level at which the Sciatic nerve divides is considered important by Neurosurgeons, Anaesthetists, Orthopaedicians and Surgeons.

Keywords: Bifurcation, Division, Sciatic nerve, Variations.

A Case of Unilateral Retroiliac Ureter in Fetus: A Case Report

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ABSTRACT

Background: Retroiliac Ureter is a rare congenital anomaly. The ureter passes deep into the iliac vessels. During embryological development; it can occur because of anomalous development of iliac vessels or because of faulty cephalad migration of the kidney. **Case Report:** During routine dissection of fetus for thesis, there was a case of left retroiliac ureter in a female fetus of 32 weeks

of gestation, weighing 2100 gms. There were associated differences in the diameter of the right and the left common iliac arteries (right iliac diameter = 0.74 mm; left iliac diameter = 2.68 mm). The right ureter was tortuous in its whole course. The left ureter was tortuous initially but in the lower part it is straight. The size of both the kidneys were also different (right kidney > left kidney). **Conclusion:** The knowledge about the anomalies of kidney and urinary tract can help radiologists and surgeons make a definitive diagnosis and prevent inadvertent injuries during surgery. **Keywords:** Retroiliac ureter, cephalad migration

An Osteological Study of Nutrient Foramina in Radius and Ulna

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ABSTRACT

Background: Hip dysplasia is an important cause of osteoarthritis, which accounts for a significant proportion of patients requiring total hip arthroplasty. The diagnosis of mild hip dysplasia is primarily based on the detection of deficient coverage of femoral head by the acetabulum. The inter-relationships between various angles measured in the radiographs of hip joint with predilection for hip dysplasia. The influence of sex and age on the development of hip dysplasia was also determined along with potential complications of hip dysplasia in young adults. **Methods:** 135 hip radiographs were studied and various angles (Centre-edge angle, Femoral head-neck-shaft angle, Tonnis angle, Delta angle) were measured in the Department of Anatomy, M. S. Ramaiah Medical College, Bangalore, Karnataka, India. To study the hip radiographs and measure various angles and there by review the imaging features for presence of any hip dysplasia. **Results:** Out of one hundred and thirty five standardised plain radiographs of hip region (AP view) studied and various angles (Centre-edge angle, Femoral head-neck-shaft angle, Tonnis angle, Delta angle) measured, 10% were found to be borderline dysplastic based on the cut off values for centre edge angle, 41% were found to have coxa vara, 26% were found to be dysplastic based on the limits set by Tonnis angle and 12% exhibited signs of fovea alta. **Conclusion:** Hip dysplasia often results in osteoarthritis of the hip at a comparatively young age. The treatment is total hip arthroplasty, which may require revision surgeries or Hip resurfacing another commonly used modality. Hence diagnosing hip dysplasia at the earliest is important for radiologists and orthopaedicians so as to initiate treatment. **Keywords:** Hip dysplasia, radiograph, osteoarthritis

Tetralogy of Fallot and its Variants –An Embryological View

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ABSTRACT

Background: Tetralogy of Fallot (TOF) is one of the commonest cardiac anomalies that refers to a combination of four related heart defects: Ventricular Septal Defect (VSD), over riding of aorta, Pulmonary Stenosis (PS) and right ventricular hypertrophy. These features are due to the anterior malalignment of the infundibular septum with the muscular septum. There are several variants of TOF and this paper aims to report one such variant with its embryological aspects. **Methods:** A 2 year old male child was referred to a super speciality centre with the diagnosis of TOF. He had complaints of breathlessness in his infancy and presented with cyanosis. The diagnosis was made based on the relevant investigations. **Results:** The variant seen in this case is the rarest type. There was TOF with large subaortic VSD with pulmonary atresia and with multiple MAPCAS (Major Aortico-Pulmonary Collateral Arteries). **Conclusion:** The knowledge of TOF and its variants is mandatory for its early diagnosis and surgical management. The latter is dependent on proper understanding of the Anatomy and its underlying embryology. **Keywords:** TOF, Pulmonary atresia, MAPCAS.

An Unusual Variation of Axillary Artery: A Case Report

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ABSTRACT

Background: Axillary artery is the direct continuation of subclavian artery from the outer border of the first rib and continues as the brachial artery at the inferior border of teres major. Pectoralis minor muscle divides the artery into three parts. The first part gives superior thoracic artery. The second part gives lateral thoracic and thoracoacromial branches. The third part gives subscapular, anterior circumflex humeral and posterior circumflex humeral arteries. **Case report:** During routine dissection for undergraduate medical students, an unusual and rare variation of branching pattern in the right axillary artery in a female cadaver of approximately 60 years of age is observed. A common trunk arises from second part of axillary artery, which gives origin to lateral thoracic artery. It continues and gives thoraco dorsal, circumflex scapular and posterior circumflex humeral artery. Third part of axillary artery gives anterior circumflex humeral artery. Superior thoracic and thoracoacromial branches originate from first and second part respectively. Branching of left side of axillary artery is normal. **Conclusion:** The importance of axillary artery and its branches lies in the usage for coronary bypass and flaps in reconstructive surgeries. Knowledge of branching pattern of axillary artery is useful during antegrade cerebral perfusion in aortic surgery, while treating axillary artery thrombosis, during surgical procedures of fractured upper end of humerus, during angiography, during breast cancer surgery etc. **Keywords:** Axillary artery; common trunk; variation

Variations in the Origin of Left Vertebral Artery and its Clinical Importance- A Case Report

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ABSTRACT

Background: The vertebral artery arises from the superoposterior aspect of the first part of the subclavian artery. The vertebral arteries ascend to the neck to enter the cranial cavity to supply the brain. In the typical pattern only three branches arise from arch of aorta, they are brachiocephalic trunk, left common carotid artery and left subclavian artery. However in 6% of the individuals left vertebral artery arises from arch of aorta between left common carotid artery and left subclavian artery. **Methods:** During routine dissection of Head and Neck region for undergraduate teaching in Department of Anatomy, MS Ramaiah Medical College, Bangalore, Variation in the origin of left vertebral artery was observed in an elderly male cadaver. **Results:** The vertebral artery on left side arose from arch of aorta between the origin of left common carotid artery and left subclavian artery. The right vertebral artery was arising from first part of subclavian artery. **Conclusion:** The anatomic and morphological variations of the left vertebral artery are significant for diagnostic and surgical procedures in the head and neck region. Identifying such a variation is essential for diagnostic improvements of vascular surgeries of supraortic arteries and also is beneficial for planning aortic arch surgery or endovascular interventions. **Keywords:** Vertebral artery, aortic arch variation, anatomical variation.

An Anomalous Course of Brachiocephalic Trunk- A Case Report

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ABSTRACT

Background: The Brachiocephalic artery is the largest branch of aortic arch; 4-5 cms in length. It arises from the concavity posterior

to the centre of the manubrium of sternum. It divides at the upper border of the right sternoclavicular joint into right common carotid and right subclavian artery. **Methods:** During routine dissection for the undergraduate students in M S Ramaiah Medical College a rare anomalous course of Brachiocephalic trunk was found. **Results:** The anomaly includes a high arch of aorta, an abnormally wide Brachiocephalic trunk overlapping the cervical part of the trachea, Pretracheal course of right subclavian and right common carotid artery. **Conclusion:** The variations of branches of the aortic arch are of surgical importance. Altered course of these arteries, if unsuspected would lead to accidental injury to these vessels and subsequent hemorrhage especially in procedures like tracheostomy. The embryological basis and clinical relevance of such anomaly will be discussed during the presentation.

Keywords: Brachiocephalic trunk, High arch of aorta, Tracheostomy

Anomalous termination of Anterior Tibial Artery, and Continuation of Peroneal Artery as Dorsalis Pedis Artery-A Case Study

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Institute/ Organization name: ESIC Medical College and Hospital, Gulbarga, Karnataka

ABSTRACT

Background: The anomalous patterns of arteries of lower limb have been studied in the interest of various clinical conditions like and surgical management. **Methods & Results:** During a routine dissection of phase I MBBS, a 66 years female cadaver demonstrated the anterior tibial artery on the left leg originated from the popliteal artery at the lower border of popliteus muscle on posterior compartment of leg as usual. But in the anterior compartment of leg, it terminated as its muscular branches to extensor muscles in the middle 1/3 rd of the leg. In the lower 1/3rd of anterior compartment of leg, the peroneal artery appeared inferior to the Interosseous membrane from the posterior compartment to anterior compartment and continued as anterior tibial artery and then in front of ankle joint as dorsalis pedis artery. During its course, the peroneal artery had a triple relation with anterior tibial nerve. Initially the Anterior tibial nerve was lying medial to the artery, crossed posterior to it in anterior aspect of ankle and then looped around to artery to lie again medial to artery in the dorsum of foot. The dimensions of anthropometry of the anomaly will be discussed during poster presentation. **Conclusion:** These arterial variations of the lower limb can be a resultant of abnormal fusions and segmental hypoplasia and absence of various embryological arterial segments. The details will be discussed during presentation. The knowledge of such anatomical variation of anterior tibial artery and its anomalous relation will help the surgeons while performing arterial reconstructions, embolectomy, angioplasty, surgical release of clubfoot and in diagnosing and managing the anterior tibial nerve entrapment.

Keywords: Hypoplastic Anterior Tibial Artery, loop of Anterior Tibial Nerve.

Unilateral Tricipital Origin of Biceps Brachii with anomalous Insertion and Innervation—A Case Report

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ABSTRACT

Background: Biceps brachii is a two headed muscle of anterior compartment of arm, with the long head arising from supraglenoid tubercle and the short head from coracoid process. Supernumerary heads have been reported with incidence of 8% to 23% with variability depending on gender and race. Tricipital origin of biceps is the most common of all, with the third head arising from either the shaft of humerus, or distal portion of deltoid tuberosity or tendon of pectoralis major; often associated with nervous variations. **Methods:** Routine dissection of cadavers was carried out, during which the third head of biceps brachii was found in the right upper limb of an elderly female cadaver. **Results:** The unilateral bulky third head originated from the shaft of humerus and

medial intermuscular septum, below the insertion of coracobrachialis, inferomedial to the short head of biceps. A few fibres of the third head were given to the bicipital tendon in cubital fossa, but most of the muscle fibres formed a band along with bicipital aponeurosis, to insert into the deep fascia of forearm. All the three heads were supplied by musculocutaneous nerve. Median nerve had a communication from musculocutaneous nerve (Le Minor type II), which then pierced the substance of the third head of biceps along with brachial artery. As a result, the median nerve and brachial artery were buried deep under the arch of the third head in cubital fossa, remaining not easily accessible. **Conclusion:** This anomalous third head with arching insertion can be a cause of neurovascular entrapment in patients. Such supernumerary origins may cause unusual bone displacement subsequent to fracture.

Keywords: Supernumerary biceps, three headed biceps brachii, variation, third head, musculocutaneous nerve, median nerve

A Split and Conjoined Median Nerve in the Arm - Case Report

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ABSTRACT

Background: Median nerve is commonly formed by the union of the lateral and medial cords of the brachial plexus, which embrace the third part of the axillary artery. In the upper arm median nerve lies lateral to the brachial artery. In the middle of the arm, it crosses medially and descends downwards and lies medial to brachial artery in the distal arm. Then it enters into the cubital fossa. The brachial artery which is continued from the axillary artery lies medial to median nerve in the proximal arm and becomes lateral to the median nerve in the distal arm and enters the cubital fossa. **Methods:** Routine dissection of cadavers was carried out, during which the median nerve was perforated by the main brachial artery in the right arm, was found in an elderly male cadaver. **Results:** In this case, right median nerve splits into two divisions of same size and joins to form a single cord in the right upper arm. That loop is traversed by the main brachial artery which is continued from the axillary artery i.e. it enters into that tunnel and comes out from it to continue medial to the median nerve and enters the cubital fossa with usual course. The median nerve enters into the cubital fossa medial to brachial artery and enters into the forearm and passes between flexor digitorum superficialis and flexor digitorum profundus. Median nerve is not giving any branches in the arm. **Conclusion:** Splitting and joining of median nerve in the arm is a very rare variation. In this case the median nerve loop traversed by brachial artery is encountered. This variation in the median nerve can be a cause of entrapment syndrome of median nerve.

Keywords: Upper limb nerves, Entrapment syndrome of median nerve, Brachial Artery, Median nerve perforation.

Aberrant Origin of Obturator Artery- A Case Report

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Institute/ Organization name: Lady Hardinge Medical College, New Delhi

ABSTRACT

Background: Obturator artery (OA), a branch of the anterior division of internal iliac artery nourishes the medial compartment of thigh. However, many studies have documented variation in the origin of the artery from other neighboring vessels. Hence, any deviation from the normal pattern should be acknowledged to prevent any injuries during herniorrhaphy or other pelvic procedure. **Methods:** The study was conducted on a pelvis of female cadaver aged 55-60 years. Length of the Obturator artery, its origin and its distance from the bifurcation of common iliac artery using the measuring tape were noted. **Results:** Obturator Artery was seen to be originating from the inferior epigastric artery bilaterally along with several unusual but significant branches budding from it. **Conclusion:** The data reported in this study shows variant OA of academic interest to Students, Anatomists, Radiologists, General

and Orthopedic Surgeons. Further dissection of more number of pelvic specimens might help to assess the frequency or prevalence of the variation.

Keywords: Inferior epigastric, External iliac artery, herniorrhaphy, pelvis, reconstruction.

Bilateral Anatomical Variations in Branching Pattern of Brachial Artery: A Case Report

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ABSTRACT

Background: Brachial artery provides the main arterial supply to the arm and it is the continuation of the axillary artery and usually divides at the neck of the radius in radial and ulnar arteries. **Case report:** During regular dissection carried out in Department of Anatomy, All India Institute of Medical Sciences, Rajkot, Gujarat (India) of upper limbs of 55-year-old female embalmed cadaver; we saw variations in brachial artery. In the right upper limb superficial radial artery was arising from the brachial artery at the level of insertion of coracobrachialis and it was joining the brachial artery in the cubital fossa and from there the brachial artery was divided into radial and the ulnar arteries. The Superficial radial artery while crossing the lower 1/3rd of the arm it was winding around the median nerve. In the left upper limb, we observed the high bifurcation level of brachial artery which was dividing into radial and ulnar arteries at the level of insertion of coracobrachialis muscle. **Conclusion:** This report describes a different pattern of brachial artery distribution. These variations might cause serious problems in a wide range of clinical situations. Recognition and documentation of developmental variations in the course, distribution, and branching pattern of brachial artery is highly significant for the radiologic diagnostic techniques and for the surgeons while performing reconstructive plastic surgery, by-pass procedures and traumatic vascular repair. It helps in the management of accidental/traumatic injuries to arteries in upper limb, avoiding the iatrogenic injuries to blood vessels during surgeries and diagnostic procedures.

Keywords: Brachial artery, superficial radial artery

Anatomical Variation in arterial supply of liver – Case Study

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ABSTRACT

Background: The variations of blood supply of liver is of great importance for general surgery, particularly hepatic surgery. Blood supply of liver is significant for liver transplantations, radiological procedures, and laparoscopic method of operation and for the healing of penetrating injuries, including the space close to the hepatic area. The pattern of the normal vascular system of the liver comes from the common hepatic artery (CHA), originating from the celiac trunk. The gastroduodenal artery (GDA), right gastric artery (RGA) and proper hepatic artery (PHA) are the main branches of the CHA. After that, the division of the PHA composes the left and right hepatic branches. **Case report:** During a routine dissection with medical students from the Department of Anatomy, Parul Institute of Medical Sciences and Research Vadodara, We found on one cadaver that the blood supply of the liver differed from a normal blood supply of liver. In one cadaver we found that liver is supplied by a direct branch from celiac trunk and in same cadaver liver is also supplied by proper hepatic artery. **Conclusion:** The knowledge about the variations in hepatic arterial anatomy is very important for surgical gastroenterologists and interventional radiologists for preoperative planning and intraoperative imaging during procedures like liver transplantation, cholecystectomy, gastrectomy, hiatal hernia repair, trans-arterial chemotherapy and hepatic arteriography.

Keywords: Liver, Blood supply of Liver, Vascular Supply of liver, Cholecystectomy, Gastrectomy

Accessory Quadriceps Femoris Muscle– A Case Report

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ABSTRACT

Background: Although many accessory muscles have been reported in lower limb, accessory Quadriceps femoris are rarely subjected to variation. Morphologically, the accessory muscle seemed to be a part of the vastus lateralis muscle bilaminated. It arose from the femur and inserted into the patella via the common quadriceps femoris tendon, supplied by the profunda femoris artery, drained into the profunda femoris vein, and was innervated by the femoral nerve. The additional head acting to power the knee extension which prevent knee flexion, in some cases mimic a soft tissue tumour. Now a days anterolateral thigh flap is widely used for head and neck reconstruction surgery. The anatomical knowledge of accessory quadriceps femoris was worthy of note for anatomists as well as for orthopedic surgeons. So the knowledge about accessory muscle is essential. **Methods:** During routine dissection of anterior aspect of thigh, we found accessory Quadriceps femoris muscle present in left thigh while right side was normal. It lies between Vastus lateralis and intermedialis muscles. Proximally the fleshy lamella attached to the femoral shaft, distally replaced by a thin, flat tendon attached to patella. **Conclusion:** During development, the primordium of muscle undergoes early splitting to form Accessory muscles. Most radiologically reported symptomatic accessory muscle involved in adult between 23-25 yrs and support the theory of congenital origin. **Keywords:** Accessory Quadriceps femoris, Vastus lateralis, Vastus intermedialis

Cadaveric Liver Features - An Observational Study

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ABSTRACT

Background: Liver is the biggest regenerative organ in our body which holds the complex and multiple function. To study the morphological features of liver which includes the presence, absence and abnormal fissures, lobes, impressions, abnormal shape and size. **Methods:** 32 Cadaveric livers were observed for this study which was collected from the Department of Anatomy Shri Sathya Sai Medical College and Research Institute, Chennai during the routine dissection class of UG. All the liver specimens were observed macroscopically and noted for any variations. The photos of the specimens were documented. **Results:** Out of 32 livers, 3 hypoplastic liver was observed, 7 with abnormal fissures and one with absence of lobe, impression. **Conclusions:** This study adds basic and essential anatomical view for radiologica, surgical intervention. **Keywords:** Liver, Hypoplasia, right lobe,

Anatomical Study of Dorsal Venous Arch of the Hand and its Clinical Implications

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ABSTRACT

Background: Veins of the hand are placed superficially and are easy to trace for various clinical procedures. Basilic vein and cephalic vein of the hand are clinically important for various surgical and invasive procedures. **Methods:** Present study was a cross-sectional observational study conducted on 100 hands (50 hands of male and 50 hands of female) in the department of Anatomy Sri Siddhartha Medical College, Tumkur, Karnataka. The dorsal venous arch was made prominent by tying a tourniquet proximal to the wrist. Various types and patterns of dorsal venous arch were observed. The types and patterns were noted and photographed adequately. **Results:** The present study showed 62% of the male hands were type -2 pattern of the arch and 56% of the female hands were type-1 pattern of arch. In male, size (formation level) of the cephalic vein was bigger than

the basalic vein. Males had more prominent venous network than females. **Conclusions:** The present study concludes that the knowledge of dorsal venous network and the formation of basalic and cephalic veins are important to clinicians, nurses and paramedical staff for better understanding during various emergency clinical procedures.

Key words: Dorsal venous arch, Basalic vein, Cephalic vein.

Morphometric Study of Posterior Condylar Canal in 150 Dry Human Skulls in Indian Population

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ABSTRACT

Background: The posterior condylar foramina are the largest of the emissary foramina's present in the human skull. The posterior condylar canal transmits the posterior condylar emissary vein and it acts as a route for venous circulation between extracranial venous system and intracranial venous sinuses. It also acts as a channel for spread of infection. The aim of the present study was to conduct a morphometric analysis of posterior condylar canal in adult human skulls. **Methods:** Completely ossified 150 adult human dry skulls of unknown age and sex were taken from the Department of Anatomy of M.S. Ramaiah Medical College, Bangalore. The presence or absence of the posterior condylar canal was noted and subjected to statistical analysis. **Results:** The posterior condylar canal was found to be present in 67% of the skulls out of which 103 canals on right side and 98 on left side. **Conclusion:** Detailed morphometric analysis will help in the planning of surgical intervention involving the skull base. This study will be useful for the anatomist, neurosurgeon, radiologist and ENT surgeon.

Keywords: Posterior condylar canal, posterior condylar emissary vein, skull base

Role of Prenatal Diagnosis in Congenital Diaphragmatic Hernia

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ABSTRACT

Background: Congenital diaphragmatic hernia (CDH) is one of the congenital abnormalities which is most devastating and often unexpected, associated with high postnatal mortality and morbidity. Even though it affects 1 in every 2500 newborns, most of the parents are unaware of this condition until their children are affected with the same. Prenatal diagnosis plays a key role in detecting and avoiding complications in future life. **Methods:** A case study was conducted in Department of anatomy, Government Medical College, Kozhikode. A 30-year-old female delivered a baby at 36 weeks of gestation with sudden onset of tachypnea and cyanosis. Endotracheal tube and Positive pressure ventilation was initiated but was in-vain. Deceased fetus was handed over to Medical College. While doing my thesis on extrahepatic biliary apparatus, hypoplastic lung and dilated bowel loops in thorax was noted, suggestive of Congenital diaphragmatic hernia. CDH is a developmental defect in diaphragm causing herniation of contents of abdomen to thoracic cavity. Today most of CDH cases are diagnosed by antenatal Ultra-sonography, which is a primary modality to diagnose CDH done at around 16-24 weeks, which identifies more than 70% of CDH cases. Early prenatal diagnosis is associated with increase in postnatal mortality which may be due to large defect, early gestational age and associated anomalies. Fetal MRI, Fetal ECHO, Karyotyping are other diagnostic modalities. **Conclusion:** Prenatal diagnosis of CDH is important to detect and avoid further complications in life. Antenatal USG provides opportunity for in utero referral to a tertiary care center for expert assessment and perinatal management. This information should be used for multidisciplinary counselling of expectant parents.

Keywords: Congenital diaphragmatic hernia, Pre-natal diagnosis, Ultrasonography

Meckel Gruber Syndrome – A Case Report

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Institute/ Organization name: K.A.P.V Government Medical College and Hospital, Trichy, India

ABSTRACT

Background: Meckel Gruber Syndrome (MGS) is a lethal autosomal recessive disorder. Its triad of features are occipital meningoencephalocele, multicystic kidneys and polydactyly. Here we have a case of MGS presenting with the classical triad. **Methods:** A thirty years old G₃P₁L₁A₁ presented with history of third degree consanguineous marriage with termination at 23 weeks of pregnancy for having multiple anomalies in pre natal ultrasound. Macroscopic findings were occipital meningoencephalocele, polydactyly in both upper and lower limbs, cleft lip, hypertelorism, microphthalmia, low set ears, club foot, sexual ambiguity and distended abdomen. Dissection of fetus include occipital defect of 1 X 1 cm occipital meningocele, bilateral large multicystic kidney, bilateral thread like ureter, tubular bladder. Kidney sectioned and found no cortico-medullary differentiation. **Conclusion:** There is no treatment for this syndrome. Prenatal ultrasonography detection of MGS is important for the diagnosis, which can be confirmed later by genetic analysis and careful post-mortem examination. To establish the diagnosis because of financial reasons, chromosomal study was not performed. Postnatal USG, computerized tomography and post mortem findings were useful in coming to the diagnosis Meckel's syndrome. Pre-pregnancy counselling is important in preventing the recurrence risk in subsequent pregnancies.

Keywords: Meckel Gruber Syndrome, Polycystic Kidney, Polydactyly

Trisomy 8 Mosaicism Syndrome

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ABSTRACT

Background: Trisomy 8 Mosaicism Syndrome (T8mS) is a condition affecting human chromosomes. People with this syndrome have three complete copies of chromosome eight in their cells. The extra chromosome eight appears in some of the cells, but not all. The symptoms of this syndrome vary considerably, ranging from undetectable to, in some cases, severe. This condition is also called as Warkany syndrome 2. T8mS is caused as a result of Non-disjunction. When this non-disjunction occurs- in the baby's development, is crucial and account for the symptoms which develops later. Some children born with T8mS have severe, highly visible physical symptoms while others display no visible symptoms, hence undiagnosed. **Case report:** An apparently normal young couple married for two and a half years was referred from a peripheral center as recurrent pregnancy loss, last abortion dated march 1st 2021. Paternal karyotyping was advised along with other routine investigations. All investigations were proved to be normal in the female partner. Trisomy 8 Mosaicism Syndrome was detected in the male partner: mos 47,XY,+8[3]/46,XY[47]. **Conclusions:** There is no cure for T8mS, but some symptoms may be treated. People with only some of the cells affected can live normal lifespan-like this patients as long as other complications from the disorder don't develop. Since the number of cells with Trisomy 8 is very less in the male partner the chances of conceiving a normal baby is high. More research is needed to identify the complications that may arise from T8mS. The outcome will be hopeful for many people.

Keywords: Trisomy 8 Mosaicism Syndrome, (T8mS), Karyotyping, Warkany syndrome 2

Robertsonian and Reciprocal Translocation in the same person

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ABSTRACT

Background: Recurrent pregnancy loss is defined as two or more pregnancy losses which is an important reproductive health

problem, occurring 1/100 pregnant women. Most commonly associated with parental balanced structural chromosome rearrangement such as balanced reciprocal or Robertsonian translocations, chromosomal inversions, embryonic aneuploidy and mosaicism. In recent years, Cytogenetic analysis in couples with genetic counselling and proper management can reduce recurrent losses. **Methods:** A couple came to Institute of Maternal and Child Health, Government Medical College Kozhikode, complaints of no living children, married since 7 years with recurrent pregnancy loss at 12 w, 10 w, 14 w. Parental karyotyping was advised along with other routine blood investigations. Samples were sent to Genetic Laboratory, Dept of Anatomy, Govt Medical College, Kozhikode. All investigations proved to be normal for the female partner. Combined Robertsonian and reciprocal translocations were detected in the male partner: 45 XY, rob(13;14)(q10;q10) t(4;22)(q33;q11.2). **Conclusions:** The Cytogenetic analysis of such a variant of mosaic-Robertsonian reciprocal translocation emphasises the importance of accurate detection for management of recurrent pregnancy loss.

Keywords: Robertsonian, Reciprocal Translocations, Recurrent pregnancy loss, chromosomal anomaly

The Teeter-Totter Tenon, Talus

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ABSTRACT

Background: The talus plays a critical role in transmitting the entire weight of the body to the ground as it is the functional connector between the leg and the foot. It controls ambulation with its unique and complex shape, with a large articular surface (70%), but with no muscle attachments. Deep squatting was traditionally adopted for self-care, activities of daily living, leisure and occupation. However modern life style is gradually replacing squatting with sitting postures. **Methods:** Habitual squatting is associated with modifications of the neck of the talus forming squatting facets. These squatting facets are taken as evidence of extreme dorsiflexion of the ankle that occurs in squatting. Given the fact that there is now huge variation in the use of deep squatting in people's daily lives in India, an insight can be achieved by studying the morphology of the talus. A total of 125 dry bone tali (75 right, 50 left) was investigated for occurrence of squatting facets on their neck which did not follow the line of curvature of the trochlear surface. **Results:** Lateral, medial, combined (both medial and lateral) & continuous (gutter like) squatting facets were found in 44%, 20%, 4% & 1.6% respectively. Lateral, medial and continuous (medial, lateral, central) extensions of trochlear surface were found in 68%, 48% and 0.8% respectively. **Conclusion:** Differences in the squatting facets in various populations may be due to habitual squatting, inheritance, migration and social structure. Insights into the incidences of these variations can be useful as an anthropological marker in forensics or to learn the social conditions of a certain population in a particular era.

Keywords: Talus, squatting facets, posture, habitual squatting, Indian population

Conventional Examination versus Immunohistochemistry in the Prediction of Hormone Profile of Pituitary Adenomas

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ABSTRACT

Background: The large majority of neoplasms located in the sella turcica are benign pituitary adenomas derived from cells of the adenohypophysis. The incidence of pituitary adenomas constitutes approximately 10-25% of all intracranial neoplasms. Their biology of pituitary adenomas is complex and they can cause a variety of endocrine syndromes and disorders, based on hormone profile secreted by proliferating cells. **Methods:** The study was carried out on 40 surgically resected pituitary adenomas. Sections from each case were stained with routine Hematoxylin and Eosin method for

histopathologic evaluation. Immunohistochemistry was performed on additional slides in order to detect specific pituitary adenomas with polyclonal antisera to anterior pituitary hormones. **Results:** 25.0% of the case subjects were interpreted as Somatotroph, 25.0% of the case subjects were interpreted as Gonadotroph, 22.5% of the case subjects were interpreted as Corticotroph, 12.5% of the case subjects were interpreted as Lactotroph, 10.0% of the case subjects were interpreted as Plurihormonal, 5.0% of the case subjects were interpreted as Mammotroph. **Conclusion:** No correlation was found between conventional features and the immune histochemical profile. The immunohistochemical profile of functional pituitary adenomas is mandatory for a correct diagnosis. We revealed that staining characteristics of the tumor cells, such as acidophilic, basophilic or chromophobe are nowadays outdated as main principle of classification, because they do not identify specific adenoma types.

Key words: Acidophilic, Hematoxylin

The Effect of Ethanolic Extract of Moringa Leaves on 4G-Mobile Phone-EMR Mediated Modifications in the Sperm Motility Pattern of Wistar Rats

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ABSTRACT

Background: Via oxidative stress, electromagnetic radiation produced from cell phones can influence the male reproductive system and sperm parameters. The scientific evidences demonstrate that Moringa oleifera leaves (MOL) contain phytochemicals which show potential antioxidant properties against various diseases. **Methods:** Twenty-four male Wistar rats (four-week-old) were divided into five groups. Control group (n=3): with no cell phone. Sham group (n=3): exposed to cell phone in switch-off mode. MOL-1 group (n=6): received 200mg of ethanolic extract of MOL/kg body weight/day orally for one month. R1 group (n=6): exposed to EMR for 96 minutes/day (4 minutes/half an hour from 8 AM to 8 PM) for one month. R1+MOL (n=6): exposed to EMR and simultaneously treated with 200mg of ethanolic extract of MOL/kg body weight/day for one month. After completion of study, the animals were sacrificed and their epididymides were removed. The fluid was obtained from the caudal portion of the ducts and with the aid of a light microscope, the percentages of increasingly motile, sluggish motile and non-motile spermatozoa calculated. To define the statistical difference between groups, one-way analysis of variance (ANOVA) and a post hoc test (Tanhane/LSD) were applied. **Results:** The cell phone-EMR caused abnormally altered percentage of all types of sperm motility pattern in R1 group. But such variables were significantly normalized by MOL extract in R1+MOL group when compared to R1 group. **Conclusion:** Ethanolic extract of MOL was able to normalize the 4G-cell phone caused anomalies in the pattern of sperm motility. This MOL activity may be due to its phytochemicals, such as flavonoids.

Keywords: cell phone; testis; sperm motility; moringa leaves; 4G-EMR

Ventral root of Spinal Cord-The hidden offenders?!

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ABSTRACT

Background: Typical spinal nerve has dorsal sensory root and ventral motor root. Attached to the ventral rami, paravertebral in position there lies sympathetic chain which contains cell bodies of sympathetic neurons. Patients who undergo sympathectomy often complain of compensatory hyperhidrosis. It is postulated that there exists an aberrant pathway conveying sympathetic stimulation. **Methods:** After laminectomy, ventral route of spinal cord was sectioned randomly at different levels in 6 formalin fixed cadavers (totally 12 sides) at JSS medical college, Mysuru. Among them five were male cadaver and one female cadaver with mean age

of 70 years. Sectioned specimens were fixed and stained with H&E stain and observed under microscope. **Results and conclusion:** In 72% of the specimens of ventral roots, sympathetic ganglia were observed. They were more populated towards the proximal aspects of the ventral root compared to middle or distal aspects. There was no significant difference between the observed cells at different levels like cervical, thoracic, lumbar and sacral. The study strengthens the concept of presence of sympathetic cells in ventral root which can contribute to the poor outcome of sympathectomy resulting in compensatory hyperhidrosis.

Keywords: Spinal nerve, Sympathectomy, Hyperhidrosis

Concept of Cellular/ Tissue/ Organ/ Whole Body Donation

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ABSTRACT

Background: Donation of individual's cell/ tissue / organ/ body from a living or dead person to a living recipient in need of transplantation is called tissue/organ donation. This topic needs prior attention as 17 people die each day for an organ transplant out of 10,7000 plus people waiting on the national transplant list as of February 2021 in India. **Methods:** DONOR is any person, ≥ 18 years of age, who voluntarily authorizes the removal of his/her organs for therapeutic purposes. Human tissues can be procured from living, deceased or from a person undergoing treatment. There are two systems of organ donation- OptIn and OptOut system. India follows 'OptIn' system where the consent is given by the donor. European Countries such as Spain follow opt out method where anyone who has not refused is a donor. In India THOA act 1994 acts as controlling authority for the organ transplant activities. Even though our Country is second in organ transplantation, the number of available organ donors is abysmal. Not only the lack of awareness about the need of organ donation and the ignorance of common men but also lack of positive confirmation of brain deaths by medical fraternity raises the concern for organ donation. 1.5 lakh kidneys, 50,000 hearts and 25,000 livers are needed for transplantation each year in India out of which only 3000 kidneys, 800 are transplanted every year. Cochlear implants, Colon and liver treatments, Continued Medical education, joint replacements, Gynaecological advancements and life saving reconstructive surgery are a few areas where organ transplants are needed. **Conclusion:** Organ donation is a complex act, involving medical, social, cultural, ethical and legal issues. It is the need of the hour where all of us should understand and make people aware of the concept of organ donation.

Key words: Organ donation, brain death

Comparative Study of the Dermatoglyphic Patterns in Type II Diabetes Mellitus Patients with Non-Diabetics

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ABSTRACT

Background: To compare the differences in the fingerprint patterns in type II diabetes mellitus with non-diabetics as control group. **Methods:** The study is conducted in 100 type II diabetic patients and 100 non-diabetic persons as a control group. A sample of 50 male and 50 female patients suffering from type II diabetes mellitus in the age group of 40 to 60 years has been examined and compared with 100 normal persons (60 males and 40 females) in the same age group to know the difference in fingerprint patterns. The fingerprints were collected by using ink and pad method as described by Cummins and Midlow. **Results:** The fingerprints in type II diabetics showed increase in the number of whorls and decreased arch and loop patterns compared to non-diabetic persons. The findings of this study are similar to the previous studies in the literature. **Conclusion:** This inference may be widely applied clinically for the early identification of type II diabetes mellitus

mainly in a mass screening of population as an additional diagnostic tool.

Keywords: Type II Diabetes mellitus, Dermatoglyphic patterns.

Unilateral Axillary Arch– A Case Report

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ABSTRACT

Background: A muscular slip or band known as axillary arch or Langer's muscle (1846) or axillopectoral muscle or Achselbogen or arcus axillaris can be present as a bidirectional band with one origin and one insertion point. However, double and rarely multiple bands towards insertion points may occur. Depending on its major contributor, it can be muscular - where majority is formed from pectoralis major; or tendinous - where latissimus dorsi is the major contributor. It can be classified as complete form when the arch arises from latissimus dorsi and extends to the trilateral tendon of pectoralis major located on the humerus; or incomplete form when it arises from latissimus dorsi and inserts into variable regions including the axillary fascia, inferior margin of pectoralis minor, coracobrachialis, coracobrachial fascia, long and short head of biceps brachii, teres major, coracoid process and first rib. Axillary arch usually crosses anterior to the axillary vessels and nerves with reported incidence of 7% to 8% with variability depending on gender and race, more frequently unilateral and rarely bilateral. **Methods:** Routine dissection of cadavers was carried out, during which an Axillary Arch was found in the right upper limb of an elderly male cadaver. **Results:** A unilateral complete axillary arch originated from the lower border of latissimus dorsi muscle which crossed anterior to the brachial plexus nerves and axillary vessels to insert into the pectoralis major muscle. The axillary arch was supplied by a branch of the thoraco- dorsal nerve. As a result, the brachial plexus nerves and axillary vessels were passing under the axillary arch. **Conclusion:** Knowledge of muscular, vascular and neural variations in the axilla is of great clinical importance. Axillary arch may compress underlying neurovascular bundle.

Keywords: Axillary arch, latissimus dorsi, variation, pectoralis major, neurovascular bundle

Anatomical Variations of Musculocutaneous Nerve

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ABSTRACT

Background: Musculocutaneous nerve arises from the lateral cord of brachial plexus in the lower part of axilla. It enters the arm where it pierces the coracobrachialis muscle. It runs downwards and laterally between biceps brachii and brachialis to reach the lateral side of tendon of biceps brachii muscle. It terminates by continuing as the lateral cutaneous nerve of forearm 2 cm above the bend of elbow. It is important for anatomists as well as surgeons to be aware of this variation to avoid intra operative complications. It is important to be aware of brachial plexus nerves variations to avoid complications during a nerve block or during upper limb surgeries. **Methods:** A routine dissection of a female cadaver conducted in Department of Anatomy, Hamdard Institute of Medical sciences and Research, New Delhi as per guidelines provided in Cunningham Manual of Practical Anatomy, the skin, superficial fascia was thoroughly cleaned, and variation has been reported regarding Musculocutaneous nerve. **Results:** The musculocutaneous nerve did not have any communication with median nerve, neither proximally nor distally and moreover it gave separate branches for biceps brachii, brachialis and coracobrachialis muscle. The musculocutaneous nerve did not pierce coracobrachialis muscle, but gave a branch to it fitting into Type 3 Venierators and Anagnostopoulou (1998) classification. **Conclusions:** Injury to musculocutaneous nerve leads to paralysis of the anterior compartment muscles of arm brachialis, biceps brachii and coracobrachialis and this can lead to motor defects of the elbow joint (flexion) and sensory defects in the lateral compartment of

the forearm. Therefore, in order to prevent damage to the nerve during surgical procedures, analysing its variation was important.

Keywords: Musculocutaneous, flexion

Variations in Median Nerve-its Formation, Communications & Relation with Axillary Artery in Axilla and Arm

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ABSTRACT

Background: The variations related to the median nerve and musculocutaneous nerve has been widely reported in literature which has potential clinical implications especially during surgeries involving axilla & arm and in administration of nerve blocks. **Methods:** 40 adult cadaveric upper limb from our department were carefully dissected & inspected to detect any variations in the structure, formation and relation of the Median nerve and its relations with Axillary artery. **Results:** In 12 upper limbs there was unilateral variation in the formation of the median nerve by three roots. There was normal pattern of formation, relation and course of Median nerve in rest of the cadavers. 6 cases of Musculocutaneous nerve not piercing coracobrachialis, and communication between median and musculocutaneous nerve was found in Photographs of abnormalities were taken. **Conclusion:** These variations have been explained as a consequence of their embryological development. These variations of formation of median nerve are clinically important for physicians, surgeons and anesthetists because symptoms of median nerve compression due to these variations may be confused with radiculopathy and carpal tunnel syndrome. The knowledge of these variations of musculocutaneous nerve is important to the surgeons and anesthetists for carrying out surgical procedures and nerve blocks in axilla and arm.

Keywords: Median nerve, Musculocutaneous nerve, Brachial plexus variations.

The Morphological and Morphometric Study of Suprascapular Notch and its Variations

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ABSTRACT

Background: The Suprascapular notch is situated in the lateral part of the superior border of the scapula, just adjacent to the base of Coracoid process. The notch is bridged by the superior transverse scapular ligament (STSL) which some time ossifies and is attached laterally to the root of the coracoid process and medially to the limit of the notch. A number of variations occur in the shape of suprascapular notch, from a discrete notch to "J" shaped, "V" shaped, "U" shaped or "O" shaped (i.e. as a complete foramen). **Methods:** We studied 140 dried scapula bone and measurements of SSN were done using digital vernier calipers. We used the Rengachary classification for this study. The following measurements were taken: The superior transverse diameter-maximum distance between superior most edges of suprascapular notch (SSN). The inferior transverse diameter maximum distance between the edges of the curved arch at the base of the SSN. **Results:** The results of our study were: J-shaped -28%, U-shaped-26%, V-shaped -15%, Partial-ossification-7%, Indentation-10%, Absent-9%, Complete ossification- 2%. **Conclusion:** Type IV supra scapular notch was found to be the most prevalent type amongst all shapes. We also found that the characteristics of the scapula (dimensions) are related to the characteristics of the supra scapular notch (type and dimensions) and there is a distinct difference between right and left side scapula.

Keywords: Supra scapular notch, Scapula, Superior transverse diameter, Vertical diameter, Supra scapular ligament

Bilateral Multiple Arterial Abnormalities of Upper Extremity

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ABSTRACT

Background: Isolated arterial system variations involving the upper limb are quite common and have been documented. Multiple arterial variations/vascular anomalies confined to a particular limb are very rare. Vascular and reconstructive surgeries and angiographic studies mandate knowledge on variations of upper extremity arterial systems. Incidence of major arterial pattern variations, as high as 18.53%, have been reported. **Case report:** Multiple variations in the arterial pattern of the upper limb were found in a formalin-preserved elderly female human donor during routine dissection for first year medical students in the Department of Anatomy. The abnormal origin of these arteries and their course were recorded. **Results:** Abnormal branching patterns and variations were seen involving the axillary and brachial arteries along with superficial palmar arch variation. **Conclusion:** Anomalous origins of upper limb arterial tree are of clinical significance to the surgeon performing various surgeries like vascular surgeries, orthopedic surgeries and reconstructive surgeries. Radiologists and anatomists should be aware of these variations as they are frequently misinterpreted.

Keywords: Abnormal branching patterns, anomalies, upper limb, variations

Incidence of Anatomic Variants in Intrinsic Muscles of Hand

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ABSTRACT

Background: Compression of the median nerve and ulnar nerve in the palm or at carpal tunnel/Guyon's canal can be exacerbated not only by tumor-like structures, a fibrotic arch, a ganglion, lipoma, aneurysm or thrombosis but also by abnormal or accessory intrinsic muscles of hand which are discussed here. **Methods:** This study was conducted on 98 disarticulated upper limbs during routine dissection of cadavers in the Department of Anatomy of MVJMC & RH. The dissection was carried out based on the steps as per the Cunningham's manual. **Results:** In 10 specimens, intrinsic muscle variation was observed. The hypothenar muscles were found to be different in four specimens (4.08%), the thenar muscles in two specimens (2.04%), and the accessory belly of the first lumbrical in four specimens (4.08%). The hypothenar muscle with the most variations is the abductor digiti minimi (ADM). The potential sources of ADM accessory heads from the flexor retinaculum, the Palmaris longus tendon, or the antebrachial fascia of forearm. In addition, accessory head for abductor pollicis brevis arises from abductor pollicis longus. Furthermore, accessory belly of first lumbrical muscles will be expressed. **Conclusion:** Accessory head of hypothenar muscle and lumbrical muscles may compresses the ulnar nerve in Guyon's canal and median nerve in Carpal tunnel respectively. The prevalence of anatomic variants in this field is significant to hand surgeons, but there has been no study of how common they are encountered.

Keywords: Intrinsic Muscles of Hand, Carpal tunnel syndrome, Guyon's Canal syndrome, Accessory head.

Study of Anatomical Variations of the Distal End of Humerus

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ABSTRACT

Background: Humerus is large and long bone in the upper limb. Anatomical variations in the lower end of the humerus knowledge

is useful for the orthopaedic surgeons in repairing fractures and reconstruction procedure of trochlea and capitulum. The study was aimed at determining the variations of distal end of humerus with respect to the lateral epicondyle, capitulum and lateral trochlear crest and finding out the predominant prevalence of different forms by gross examination. **Methods:** 80 dried Human humerus are examined grossly from the department of Anatomy, K.A.P.V.Govt. Medical College, Trichy, level of the lateral epicondyle to that of the capitulum, the extent and shape of the capitulum at the distal margin of the humerus, prominence of the lateral trochlear crest were studied for the variations. **Results:** In 72% of humerus the level of the lateral epicondyle was found at the same level of capitulum and in 28% of humerus the level of the lateral epicondyle was found above the level of the capitulum, the Distal margin of the capitulum was flat and extended onto the distal surface of humerus in 83%, and was convex, extended onto the posterior surface of humerus in 17%. Development of the lateral trochlear crest was poor in 15%, moderate in 75% and well developed in 10% of humerus. **Conclusion:** This study will be useful for reconstructive surgical procedures of trochlea, capitulum and for designing the elbow prosthesis, repairing the damage of lateral epicondyle and radial collateral ligament.

Key words: Distal end of Humerus, Capitulum, Trochlea, Lateral epicondyle.

Assessment of DNA damage through Micronucleus Studies in Subjects exposed to Formalin

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ABSTRACT

Background: Formaldehyde (FA) is the reactive and simplest of all the aldehydes. It is used as a preservative in anatomy, pathology and forensic laboratories. The international agency for research on cancer has classified FA as a carcinogen that can cause nasopharyngeal carcinoma, Leukaemia, Liver and pancreatic cancer. **Methods:** The aim of the study was to assess the DNA damage in peripheral blood lymphocytes and in buccal cells by Micronucleus assay in Formalin exposed workers of Anatomy, Pathology and Forensic laboratories and compare with the control group, and also to analyze the relationship between frequency of Micronuclei and duration of exposure to formalin. **Results:** The mean and standard deviation (SD) of micronuclei in peripheral blood of exposed was 8.35 and in controls was 4.18. There was a significant increase in the frequency of MN in exposed group when compared with the comparison group ($p < 0.5876$). Pearson's correlation test showed a positive correlation between the years of FA exposure and the number of micronuclei in buccal cells and peripheral blood indicating that DNA damage due to FA was directly proportional to the duration of exposure ($r = 0.8, 0.9$). **Conclusion:** The present study was done to assess the DNA damage in people who were exposed to FA and a control group not exposed to FA by buccal cell and peripheral blood Micronucleus Assay. There was a significant increase in the MN in people exposed to FA which was directly proportional to the duration of exposure.

Keywords: DNA damage, buccal cells, Formalin, Peripheral blood, Micronuclei

A Baseline Anthropometric Study of Dominant Hand for Better Designing of Surgical Equipments

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ABSTRACT

Background: The human hand is a very complex structure, capable of relaying sensory information about temperature, shape and texture of the object to the brain. Hand anthropometry is useful for designing the surgical equipment and machine for better efficiency and more human comfort. Instrument were consider important as they are related to the surgeons directly and effected their posture undoubtedly. Specifically, several reports pointed out muscles exhaustion, pressure areas, neural injury and rapid fatigue caused by instruments handles. Aim of the study is to conduct a baseline

anthropometric study of dominant hand for better designing of surgical equipments. **Methods:** This study has been done on 100 (50 males and 50 females) normal Indian adult population. Each subject had its hand length, hand breadth, hand span and wrist circumference measured with the help of measuring tape while hand grip strength was measured by dynamometer. Comparison of parameters was investigated by independent t-test. The p value less than 0.05 was considered statistically significant. **Results:** There was statistically significant variation ($p < 0.05$) in hand length, hand breadth, wrist circumference and hand grip strength between male and female while no significant variations was observed in case of hand span between males and females. Females had lower values in all parameters than compared to that of males. **Conclusion:** Females had lower values of hand length, hand breadth, hand grip strength, wrist circumference, hand span and hand grip strength than that of males. Since dimensions and strength of the hand of females are different from males so surgical equipment should be designed as per gender. Hence, these baseline values will help in appropriate designing of the surgical equipments which will ultimately increase the efficiency and the quality of end result.

Keywords: Hand Anthropometry, Hand grip strength, Dynamometer, Surgical equipments

Cyclophosphamide induced Histological changes in Testis of Swiss Albino Mice

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ABSTRACT

Background: Cancer is one of the leading causes for morbidity and mortality. The most often used anticancer drug is Cyclophosphamide, the continuous usage of which may affect the fertility outcome in young boys. Henceforth an attempt is made in this experimental study design on mice to look into the histological changes in the testis tissue post exposure to the Cyclophosphamide (CP). **Methods:** Healthy male Swiss mice ($n = 43$) from Animal Research Facility, Manipal were used for the study. They were maintained in well ventilated polypropylene cages and were divided as control ($n = 7$) and test ($n = 36$). In the test group, the mice were injected with CP at variable doses as per body weight. From each group certain no. of mice was sacrificed. A parallel control group was kept for each of the treatment intervals. Similarly, the prepubertal mice were also considered. The testicular tissue was then extracted and used in study. **Results:** A significant damage was noticed in the spermatogenic cells. The no. of germ cells were 53.78 ± 1.58 in prepubertal and 48.29 ± 0.99 in adult mice (control group). Whereas in CP treated cases, the count reduced to 29.43 ± 0.99 and 24.01 ± 0.94 respectively ($p < 0.001$). **Conclusion:** The experimental design studied here throws light on dose and time dependent toxic effect of the most commonly used anticancer drug- cyclophosphamide.

Keywords: Cyclophosphamide, testis histology, swiss albino mice.

Histopathological findings in Kidneys with Polar Artery: A Demystifying Endeavour

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ABSTRACT

Background: Normally one renal artery from the aorta enters the hilum of kidney. It divides after entering the hilum into branches to five vascular segments. The branches arising outside the hilum are classified as extra-renal arteries. They enter either through the hilum (hilar) or through one of the poles (polar). Inside the kidney the artery divides into lobar, interlobar, arcuate and interlobular arteries. The interlobular artery gives off afferent arterioles that enter glomeruli. The polar arteries that enter through the poles are called aberrant arteries. The present study was undertaken to compare the histopathological features of kidneys with polar artery with that of kidneys without polar artery. **Methods:** It was an observational study conducted in the Department of Anatomy in collaboration with

Pathology Department, at a tertiary care referral institute. Twenty-two kidney specimens obtained from cadaver were analyzed. Study group constituted 11 specimens of kidneys with polar artery. Control group included 11 specimens of kidneys without polar artery. Sections were taken from the upper pole and lower pole in each kidney. In polar kidneys the sections were taken perpendicular and close to the polar arteries. The sections were subjected to routine histological processing and staining as per the standard operating procedure. Histopathological findings in both the groups were documented and compared. **Results:** 1. The number of sclerosed glomeruli per high power field was higher (Mean = 4.51) in the control group (P = 0.036). 2. The number of viable glomeruli per high power field was higher (Mean = 24.31) in the study group (P = 0.060). 3. Agglomeration of arterioles [11 cases (100%)] was more common in the study group (P = 0.001). 4. Cystic change [03 cases (27.27%)] was seen only in the study group (P = 0.062). **Conclusion:** The study may be considered as a demystifying endeavour to recognize the histopathological features such as agglomeration of arterioles, increased number of viable glomeruli and cystic change associated with kidneys having polar artery. This calls for detailed research to elucidate the mechanisms and clinical correlation.

Key words: Anatomy, Pathology, Cadaver, Arteriol

Healing Diabetic Wounds using Indian Traditional Medicines: A Biomechanical and Histological Exploration

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ABSTRACT

Background: Diabetic wounds have a serious negative impact on the health-care economy of a country, especially the developing countries where resources are poor and funding is limited. Different approaches have been adopted in its treatment. Use of traditional medicines are one among them and has drawn global attention. *Ayurveda* and Indian folk medicine have used Honey (H), Ghee (G), *Glycyrrhizaglabra* (GG), and *Nerium indicum* (NI) effectively for treating normal wounds. However, the involvement of these traditional medicines in treating diabetic wounds is less explored. Present study is an attempt to explore the same. **Methods:** H, G, GG and NI were used singly and in combination to treat excision and incision wounds in streptozotocin induced diabetic rats. At two different time intervals (i.e., days 8th and 16th for excision and days 6th and 11th for incision wound models), the biomechanical, histological and immune histochemical (IHC) parameters were assessed in the wound tissues. **Results:** The results showed, increased wound breaking strength, rapid epithelialization, early wound closure, increased vascularity, systematic rearrangement of collagen in the wounds treated with the above mentioned traditional medicines in hyperglycemic conditions. In addition, we also found the complementary activity of IL-1 beta and myofibroblasts which are crucial for better wound healing. Among all the treated groups, Honey and GG showed the best results. **Conclusion:** Traditional medicines (singly and in combination) can play a vital role in treating diabetic wounds. The study thus renders an increased value to the efficacy of the traditional Indian medicines in the national and international scenario. Additionally, the derivations from the present study may aid in further evaluation of various other intricate mechanisms which may lead to development of new therapeutic approaches to the treatment of medically challenging wounds.

Keywords: Wound Healing, Diabetes, Honey, Ghee, *Glycyrrhizaglabra*, *Nerium indicum*, Interleukins, myofibroblasts

Ameliorative effect of *Punica granatum* on Histo-Morphology of Sertoli and Leydig cell in Rats with exposure to 4G Mobile Radioelectromagnetic Radiation

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ABSTRACT

Background: The global incidence of male infertility is about 13–18%. In India, nearly 10 % of married couples experience male infertility. Male infertility can be attributed to an array of Electromagnetic radiation. Pomegranate fruit is inescapably linked with fertility, birth and eternal life because of its many seeds. **Methods:** Thirty male Sprague Dawley rats 10-14 Weeks old, weighing 160-180 gm, animals were divided into the five following groups (n=6): Group I: control group. Group II: RF-EMR group exposed to 800 - 2400 MHz 4G mobile exposure emitted by talk mode for 60 min/day for 3 months. Group III: RF-EMR & Pomegranate juice group exposed to radiation like group II concomitant with Pomegranate juice 1 ml/day orally. Group IV: RF-EMR Recovery Group exposed to radiation like group II, then kept unexposed for another 3 months for recovery and Group V: Pomegranate juice group rats are administered to 1ml/day orally. **Results:** Our study shows number of sertoli cells and leydig cells was significantly reduced in 4G mobile RF-EMR exposed rats, except RF-EMR & Pomegranate juice group and 4G RF-EMR Recovery groups when compared to the control group. Pomegranate juice consumption provided an increased number of sertoli cells and Leydig cells when compared to the control group. The following Histo-morphological changes were found in the 4G mobile RF-EMR exposed rats when compare to control group. 1. Resting on irregular basement membrane. 2. Leydig cells with darkly stained nuclei, vascular nuclei and acidophilic vacuolated cytoplasm containing small lipid droplets. **Conclusion:** 4G mobile RF-EMR could cause Histo-morphological changes of sertoli cells and leydig cells and reduction in the number of sertoli and leydig cells. However the co administration of pomegranate juice was protective the 4G mobile induced alterations.

Keywords: Radio frequency-Electromagnetic radiation, Sertoli cells, Leydig cells, Sprague Dawley rats, Pomegranate juice

Metabolic Syndromes and their effects on the Endometrium –An experimental study in Swiss Albino Mice

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ABSTRACT

Background: The endometrium has numerous insulin receptors in which insulin has dual effect of promoting hyper androgenism and reduction of IGFBP-1. And in obesity hyper estrogenic state is due to the increase in the substrate for the conversion of androstenedione to estrogen in the adipose tissues. Hence, metabolic syndromes which are largely subclinical have direct effect on the female reproductive system and the present study is attempted to analyze the same in the swiss albino mice. **Methods:** 36 female swiss albino mice were divided into Control, High fructose and High fat diet groups with 12 animals in each group. The animals were fed respective diet which was prepared daily and fed for a period of 12 weeks and animals were sacrificed by the administration of ether. Glucose, Insulin and HOMA-IR were assessed and the uterus was removed and processed for histopathological analysis. Kruskal wallis and post hoc tests were employed for statistical analysis which showed significance. Endometrium exhibited complex hyperplasia with nuclear atypia which suggests the positive role of insulin resistance. **Results:** The present study proves the role of metabolic syndromes in the development of reproductive disorders in female swiss albino mice. **Conclusion:** The present study concludes that subclinical conditions like metabolic syndromes are responsible for many of the reproductive disorders in females and hence dietary modifications and healthy lifestyle practices can prevent such disorders.

Keywords: Hyperinsulinemia, endometrial morphology, high sugar diets

Effect of Resveratrol on Neuronal Population in Colchicine induced Alzheimer's Disease model of Albino Wistar Rats

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ABSTRACT

Background: Alzheimer's disease (AD) is a neuro degenerative disorder, commonly seen in older individuals. This is characterized by cognitive dysfunction leading to dementia. Pharmacological treatments for AD are mainly targeted on its symptoms like memory loss and cognitive impairment. The pathophysiology involved in AD are intra-neuronal accumulation of hyper-phosphorylated tau protein as neuro fibrillary tangle and extra cellular beta amyloid plaque deposition, due to oxidative stress. Here we study the neuro-protective effects of Resveratrol (RSV) and its treatment efficacy in AD. RSV is a naturally available polyphenolic compound, which has antioxidant, anti-cancerous, anti-inflammatory and anti-aging properties. **Methods:** The present study included 3 months old male albino Wistar rats, which were in house bred and weighting about 220-250gms. The rats were divided into eight subgroups which included control, AD induced, RS treated and Donepezil treated groups in different doses and combinations. Each subgroup included 6 rats. Estimation of neuronal population in different regions of the brain was done after brain sectioning and staining with cresyl violet stain. **Results:** Colchicine has induced neuronal destruction in frontal cortex and different regions of hippocampus. When the rats with AD, were treated with RSV, there was marked elevation in the neuronal population, when compared to AD model rats. **Conclusion:** Resveratrol can protect the neurons against the oxidative damage which is produced by the colchicine in Albino Wistar rats.

Key words: Alzheimer's disease, neuroprotection, antioxidant, resveratrol, Frontal cortex, hippocampus

Micro Anatomy of Myenteric Plexus in Large Intestine of Aborted Fetuses

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ABSTRACT

Background: The enteric nervous system plays a vital role in the gut motility. The development and maturation of inter muscular plexus (myenteric plexus) and sub mucous plexus (Auerbach plexus) plays a dynamic role in gut motility. The absence or immature plexus leads to development disorders like aganglionosis or hirschsprung disease. Many were reported in absence, maturation and migration pattern of myenteric plexus in the sigmoid colon, rectum and anal canal but the literature related to other parts of large intestine is very minimal. This study is intended to the detailed quantitative morphometric analysis of entire large intestine of aborted fetuses with a gestation period of 13 weeks and above. **Methods:** The entire large intestine of 50 aborted fetuses were processed by NADPH Diphorase enzyme histochemistry method. **Results:** The myenteric plexus observed at the age 13 weeks of gestation period. Numerical density was calculated from caecum to anal canal but it was not uniform. Neuronal cell profile was significant in the sigmoid colon. Abnormal ganglion cells were noticed. **Conclusion:** The myenteric plexus appeared at the age of 13 weeks of gestation period. The morphometric analysis of myenteric plexus has showed significant changes as the advance of the gestation age.

Key words: Myenteric plexus, enzyme histo chemistry, development

Macro and Microanalysis of Vasculature in Ligamentum Teres Femoris

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ABSTRACT

Background: A foveolar artery from acetabular branch of medial circumflex femoral runs in the substance of ligamentum teres femoris (LTF). The blood vessels in LTF play a possible role in

supply to femoral head. The study was designed in cadavers to explore vasculature at two ends and in substance of LTF. **Methods:** 42 ligament specimens were obtained from formalin-embalmed cadavers (16 male and 5 female). The cut ends of ligament and sub-synovial vessels were observed under dissection microscope. The transverse sections from proximal, distal, and middle parts of LTF were analyzed and compared under light microscope. The Image J software was used to collect quantitative data and results were statistically analyzed. **Results:** The blood vessels were present at proximal cut end in 78.6% (33/42), and at the distal attachment in 28.6% (12/42). The sub-synovial vessels were noted in all specimens (n = 42) on the proximal part of the ligament, and in 30.9% (13/42) on the distal side. The mean number of blood vessels in proximal, middle, and distal parts was 23 ± 6 ; 27 ± 7 ; and 20 ± 5 , respectively. The average diameter of blood vessels in the proximal, middle, and distal parts was $51.2 \pm 12.1 \mu\text{m}$; $47.1 \pm 6.1 \mu\text{m}$; and $53.2 \pm 6.5 \mu\text{m}$, respectively. The average mean luminal surface area of blood vessels in the proximal, middle, and distal parts was $11029 \pm 1580 \mu\text{m}^2$; $8452 \pm 1031 \mu\text{m}^2$; and $5020 \pm 1161 \mu\text{m}^2$, respectively. There was statistically significant difference between proximal and distal parts in the number ($p=0.007$) and luminal surface area ($p<0.001$) of blood vessels. **Conclusion:** The blood vessels run in LTF both in subsynovial connective tissue and in the substance of the ligament. The findings support a potential role of the ligamental vessels in supplying adult head of femur.

Keywords: Round ligament of femur, hip joint, femur head, acetabulum, cadaver

Histomorphometric Assessment of the Protective effect of *Tinosporacordifolia* (Willd) Miers on Drug induced Nephrotoxicity

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ABSTRACT

Background: Early literatures have prescribed various herbs for the cure of renal disorders. Nephroprotective herbs are protective against nephrotoxicity. *Tinosporacordifolia* (Willd.) Miers. Has a role in the treatment of metabolic disorders including diabetes and kidney disorders. However, there exists a lacuna of studying the protective effect of the herb on drug induced nephrotoxicity at different time periods in specific morphometric terms. The current study is aimed at studying the nephroprotective effect of *Tinosporacordifolia* (Willd.) Miers. on drug induced nephrotoxic changes upon simultaneous administration of the nephrotoxic drug and the herb using histomorphometry. **Methods:** Gentamicin induced Nephrotoxicity model in Rats (adult, male, Wistar) was employed for the study. Simultaneous administration of Gentamicin and the ethanolic extract of the stem of *Tinosporacordifolia* (Willd.) Miers. took place for 8 days. Levels of Sodium, Potassium, Calcium, Urea and Creatinine in the serum were measured. Body weight of the animal, Gross appearance, weight and volume of the Kidney were assessed. Histomorphometric assessment of the Kidney was carried out using ocular micrometer.

Results: The biochemical analysis of the serum reflected the protective influence of *Tinosporacordifolia* (Willd.) Miers. extract on the Acute Tubular Necrosis induced due to Gentamicin nephrotoxicity. This correlated with the regenerative changes brought about by the herbal extract in the damaged renal tissue at the gross and histological levels in terms of the reduction of enlargement and regeneration of the tubular epithelium, respectively. **Conclusion:** Simultaneous administration of *Tinosporacordifolia* (Willd.) Miers. stem extract is protective in drug induced nephrotoxic condition. Hence, *Tinosporacordifolia* (Willd.) Miers. extract shall be beneficial to the kidney when taken along during consumption of potentially nephrotoxic drugs.

Keywords: Gentamicin nephrotoxicity, Cell Height, Wall to Lumen Ratio, Proximal convoluted tubule, Acute Tubular Necrosis, Wistar rats, Simultaneous Treatment

Variation in the origin and branching pattern of Lateral Circumflex Femoral Artery: A case report

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ABSTRACT

Background: The profunda femoris, a deep branch of the femoral artery, gives a lateral branch the lateral circumflex femoral artery (LCFA). The LCFA runs laterally between the anterior and posterior divisions of the femoral nerve, passes behind the sartorius and the rectus femoris, and divides into ascending, transverse and descending branches. Knowledge of variations in the origin, course and branches of LCFA is significant since such anatomical variations have a great impact on both interventional and surgical procedures. **Methods:** During routine dissection of the femoral triangle for the first year MBBS students, we noticed a variation in the origin and branching pattern of the LCFA in the right femoral triangle of a 65 year old male cadaver. The front of thigh was dissected and the femoral artery along with all its branches were clearly exposed. The variation in LCFA was documented and photographed. **Result:** The LCFA was observed as a direct branch of the femoral artery originating deep to the inguinal ligament and dividing the femoral nerve into anterior and posterior divisions. The branches arising from the LCFA were the superficial epigastric, superficial circumflex iliac, muscular branches and ascending, descending and transverse branches. The superficial external pudendal artery followed the normal course arising from the femoral artery. The origin and course of the profunda femoris was normal. **Conclusion:** Documentation of variations in the femoral artery branches is of great importance for the clinicians to avoid intra-operative bleeding during the surgical procedures like antero lateral thigh flaps, coronary artery bypass grafting, hip and femur head replacement and thus minimize complications.

Keywords: Profunda femoris, lateral circumflex femoral artery, superficial epigastric, superficial circumflex, angiogram.

Double Superior Vena Cava – A Rare Cadaveric Case Report

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ABSTRACT

Background: Superior vena cava is the large valveless vein that collects the deoxygenated blood from upper half of the body and drains into right atrium. It is formed by the union of right and left brachiocephalic vein. Double Superior Vena Cava is a rare variation of venous system. The incidence of double superior vena cava is observed as 0.3-1.3% in general population. It presents as isolated entity or associated with congenital heart disease. **Case Report:** During routine dissection of the thoracic region of a 55 yrs old male cadaver in the Department of Anatomy in Pondicherry Institute of Medical Sciences, we observed a large vein on the left side of the upper part of the heart in the middle mediastinum. In further dissection, it was confirmed as Double Superior Vena Cava. Right superior vena cava drains into right atrium and persistent left superior vena cava drains into coronary sinus. We could not observe any oblique connection between right and left superior vena cava and also no other variation in and around the heart. **Conclusion:** Awareness and knowledge of such variation is important for Surgeons and Radiologists while performing invasive Cardiac procedures.

Keywords: Double superior vena cava, Persistent left superior vena cava

Variation in origin in one of the Lateral branch of Abdominal Aorta-A Case Report

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ABSTRACT

Background: Inferior phrenic arteries, which constitute the chief arterial supply to the diaphragm, are generally the branches of

abdominal aorta, however variations in their mode of origin is not uncommon. Very less information is available regarding the functional anatomy of the inferior phrenic artery in anatomy text books. **Methods:** This was found during routine dissection of abdomen in a 61 year old adult male cadaver in the department of Anatomy, Kalpana Chawla Government Medical College. It was seen that right inferior phrenic artery (RIPA) took its origin from right renal artery. Further distribution of RIPA was normal. Left inferior phrenic artery (LIPA) took its origin from celiac trunk. **Results:** The Inferior phrenic artery (IPA) usually originates from the aorta or celiac trunk and less frequently from the renal, hepatic or left gastric arteries. The IPA is a major source of collateral or parasitized arterial supply to Hepatocellular carcinoma (HCC), second to the hepatic artery. So a surgically inoperable HCC can be treated by transcatheter embolization of not only the right and left hepatic arteries, but also by embolization of a RIPA, if involved. The LIPA gives collateral supply to stomach in case of gastric arterial occlusion. So during a TACE procedure, gastric and esophageal damage can occur if non target embolization is done. **Conclusion:** Knowledge of variation in origin of inferior phrenic artery could be valuable during treatment of hepatic neoplasm, liver transplants, biliary tract surgery and during transcatheter oily chemoembolization technique. Accurate knowledge regarding this is important for carrying out vascular and reconstructive surgery and for evaluation of angiographic images.

Keywords: Right inferior phrenic artery, Right renal artery, left inferior phrenic artery (LIPA)

Morphometric Study and Sex Determination of Clavicle using Various Parameters with its Clinical Implications in Identification and Arthroplasty

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ABSTRACT

Background: Clavicle, generally called as the collar bone or beauty bone is the only long bone that lies horizontally in our body. This is the first bone that undergoes ossification and lacks medullary cavity. Usually skull, pelvis, some long bones like humerus and femur are used for the sex determination from the skeletal remains. But few studies have shown that clavicle can also be used for determining the sex. The aim of our study on morphometry of clavicle is to determine the sex and also assist in arthroplasty. **Methods:** Study will be done on 93 clavicle bones taken from the Department of Anatomy, KMC, Manipal. Various morphometric parameters will be measured using vernier calliper, protractor to measure the angle, thread for circumference. **Results:** Will be presented in the conference. **Conclusion:** This study will help the forensic anthropologists in identification of sex using clavicle. And will be helpful for orthopedic surgeons while doing arthroplasty of sternoclavicular joint, or acromioclavicular joint for surgeons.

Keywords: Clavicle, sex determination, Morphometry

A Study of Asymmetry of Finger Print Pattern in Population of Lucknow

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ABSTRACT

Background: Fingerprints are considered to be the most reliable criteria for personal identification. The present study was undertaken to observe the distribution of finger print pattern in males and females, and to observe the bilateral asymmetry in the population of Lucknow. Distribution of dermatoglyphic fingerprint patterns were studied in both hands among males and females and compared. **Methods:** The study was carried out in 160 adult subjects (80 male and 80 females) of Lucknow. The present study was conducted in the department of Anatomy Integral Institute of Medical Sciences & Research IIMS&R. **Result:** In the male frequency of finger prints pattern were formed by loops (68.2%)

followed by whorls (16.3%) and arches (15.3%). In the female frequency of finger prints pattern were formed by loops (66.1%) followed by whorls (3.6%) and arches (3.2%). **Conclusion:** This audit draws out the importance of Dermatoglyphics studies in different fields. In the investigation of recurrence appropriation of unique mark designs among subject contrasts from other population. **Keywords:** Dermatoglyphics, loops, whorls, arches.

Foramen Index useful indicator in Sexing of Crania

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ABSTRACT

Background: In sex of the individual, skull is one of the commonest parts of the skeleton. Adult skulls show a few non-metrical and metrical differences. **Methods:** Total 310 adult human crania of known sex as male or female from various medical colleges of Western India were studied for the present study. The anteroposterior and transverse diameter of foramen magnum was recorded with the help of sliding caliper. Foramen magnum index was calculated by using formula. **Results:** The sex difference in the mean values of foramen magnum index of cranium in males and in females is statistically significant ($P < 0.01$). **Conclusion:** The dimensions of the foramen magnum have clinical importance because vital structures pass through it may suffer in FM achondroplasia and in FM herniation.

Keywords: Foramen, magnum, sexing, index

Quantitative Analysis of Palmar Dermatoglyphics among Transgender women (MtF), Male and Female gender in the South Indian Population

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ABSTRACT

Background: There is a palmar dermatoglyphics in humans that gives considerable research interest. They exhibit sexual dimorphism among males and females. However, gender identity disorder (GID) is still controversial. The quantitative analysis comprises the number of ridges in the inter digital areas on the palm (a-b, b-c, and c-d), the distance between three triradii, and the atd angle were counted in all three genders. **Methods:** A total of 392 subjects (Male 130, Female 122 and Transgender women 140) were enrolled for this study. The photo-scanning method was used for recording the hand and converted it into an image file. Measurements were taken by digitizer software with the help of a personal computer. Measurements of atd angle and ridge density were compared by using ANOVA to find out any mean difference among the group. Then a comparison of such values between two groups has been made by student T-test for its significance. **Result:** The mean value atd angle of the right and left hand between the male and female gender is insignificant (right-hand $P = 0.033$, left hand 0.373). In between all three gender atd angle mean value is insignificant. The distance between three triradii in the interdigital area of the three genders is highly significant ($P = 0.00$). **Conclusion:** The result indicates that the distance between three triradii mean values of all three genders are significantly different ($P = 0.00$) but at d angle and the density of ridges were not significant with all three genders.

Keyword: Trans gender woman, atd angle, dermatoglyphics, tri-radius

Morphometric Evaluation of Foramen Magnum in desiccated Human Skulls – A focus on Gender Disparity

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ABSTRACT

Background: Morphometry of skull is utilized for human studies like estimation of age and physique. Foramen magnum is a significant foramen in the region of base of skull which is clinically

essential because of the imperative structures fleeing through it. Despite its significance, there is paucity of morphometric studies focusing on gender disparity of foramen magnum. The current study was carried out to determine the gender variations in the morphometric parameters of foramen magnum. **Methods:** The current study was carried out on 50 dry adult human skulls of which 25 were male and 25 female. In the present study dry human skulls from the Department of Anatomy, Velammal medical college hospital and Research Institute, Tamil nadu were utilized. Vernier caliper was utilized to calculate the antero posterior and transverse diameters of foramen magnum and the area of foramen magnum was calculated using Radinsky's formula. Readings were documented discretely for male and female skulls. Further obtained data's were analyzed statistically. **Results:** The mean antero posterior diameter of the foramen magnum was 34.84 ± 1.31 mm in males, whereas it was 33.68 ± 1.11 mm in females. The mean transverse diameter of the foramen magnum was 28.72 ± 1.34 mm in males whereas it was 27.68 ± 1.28 mm in females. The mean area of foramen magnum in males was 786.20 ± 43.24 mm² whereas it was 736.44 ± 44.46 mm² in females. Statistically, a significant difference was observed between male and female skulls in relation to all parameters measured in the present study. Mean scores indicate that male skulls had high magnitude in all the parameters than female skulls. **Conclusion:** The morphometric details of foramen magnum in different gender provide a valuable reference value for surgeons and also useful in forensic investigation for gender determination.

Key words: Foramen magnum, Morphometry, Gender disparity, skull.

Study of Sexual Dimorphism in Adult Human Clavicles

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ABSTRACT

Background: The clavicle is the only horizontally placed long bone of the human skeleton which shows high variability in its shape and size; more frequently than other long bones of human skeleton. The anatomical variability of this important bone of the anterior human thoracic skeleton has been widely explored by clinicians and forensic anthropologists. So, the present research was undertaken with a view to study the sexual dimorphism in adult human clavicle by morphometric parameters. **Methods:** The cross-sectional study was conducted on 100 dry macerated adult human clavicles of known sex (50 males and 50 females) in Department of Anatomy, Pt. B.D. Sharma, PGIMS, Rohtak, Haryana. The parameters studied were maximum length of clavicles, weight of clavicles, midshaft circumference and robustness index of clavicles. **Result:** The mean values of all parameters (maximum length, weight, midshaft circumference and robustness index of clavicles) were observed higher in males in comparison to females. On comparing between right and left sided clavicles, mean values of all parameters was found to be higher in right sides clavicles than left sided clavicles. **Conclusion:** The determination of sex from the clavicle has a great medico-legal significance to the toxicologists. It also helps the anthropologists in their study of evolution of mankind and migration of races. The maximum length as a parameter of sex determination is statistically significant ($p = 0.001$) in differentiating the sex of the clavicle. The length gives better results than that weight of clavicle, volume of clavicle and other parameters as these parameters of the bone varies with age and health status of the individual.

Keywords: Bone, Clavicle, Human, Significance.

Determination of Sex by Study of Ischio-Pubic Index in Human

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ABSTRACT

Background: The introduction of metric method has provided the simplicity and accuracy to determine the sex of skeletal remains. Techniques requiring the measurements of diameters, circumferences or cross sectional areas of tubular bones may

provide the needed means for sexing fragmentary remains. Several studies of metrical characteristics in various pelvic regions have been made, leading to the production of various indices. Ischio pubic index, one of the parameters affecting the pelvic inlet and this is of interest to obstetricians and anatomic anthropologists. **Methods:** Materials for the current study comprised of 40 hip bones, (R20:L20) obtained from Department of Anatomy, R.N.T Medical College, Udaipur, Rajasthan. Length of Pubis and Length of Ischium were measured and Ischio-Pubic index was calculated. **Results:** The ischiopubic index was found to be more in females than males. **Conclusion:** These variables can be used to determine sex from human hip bone and its fragments. **Keywords:** Pubic length, Ischium length, Ischio-Pubic Index.

Study of Gastrointestinal Anomalies among Stillborn Fetuses in Mysuru: An Autopsy Based Study

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ABSTRACT

Background: Gastro intestinal anomalies refer to the structural or functional abnormalities of the gastro intestinal tract which occur during the intrauterine developmental process. The objective of this study is to determine the pattern of distribution of gastro intestinal anomalies among still born fetuses through an autopsy study. **Methods:** This descriptive, cross-sectional study consists of 50 stillborn fetuses. The fetuses were collected from the Department of Obstetrics and Gynecology, JSS Hospital, Mysuru. The fetus was fixed in 10% formalin and formalin was injected into the thoracic cavity, abdominal cavity, and cranial cavity for fixation of the organs. The autopsies were performed as per standard fetal autopsy protocol. The gastro intestinal anomalies were studied in detail. **Results:** Out of the total 50 stillborns studied, gastrointestinal anomalies were observed in 5 fetuses (10%). Among the 5 fetuses, 2 were male and 3 were female and the ratio of male to female is 2:3. The omphalocele was the most common gastro intestinal anomaly observed in the present study. The other anomalies were gastroschisis, eventration of the diaphragm, and congenital diaphragmatic hernia. **Conclusion:** This study confirms the utility of fetal autopsy in identifying the cause of fetal loss which will help in counseling the couple for future family planning. When the couple face a fetal demise, there are always apprehensions about the cause of death and its recurrence risk. The fetal autopsy is the gold standard in the investigation of the cause of fetal death.

Keywords: Congenital anomalies, Gastro-intestinal system, Autopsy, Stillborn

Morphometric Study of Humerus for Sex Determination using Various Parameters

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ABSTRACT

Background: Humerus is a long bone of the arm running from shoulder to elbow it consist of a proximal end, shaft and distal end. The proximal part is marked by a head, anatomical neck, surgical neck, greater and lesser tubercles and inter tubercular sulcus whereas the lateral and medial border forms the medial and lateral supra epicondylar ridges of the distal humerus. Identification of sex from the remains of human body is a difficult task. So, if we have parameters in bones which can help in identification of sex it will help the forensic anthropologist to identify. So, this study was undertaken to identify various parameters of humerus in identifying sex. **Methods:** Study is conducted on 95 dry humerus of unknown sex and various parameters are implemented to identify the gender of the humeri all the data are collected using a digital vernier caliper. The data is analysed using Independent T test and a comparison is made between the male and female to find out its significance. **Result:** Vertical diameter of humeral head, A/P diameter of humeral head, circumference of the humeral head,

height of humeral head, angle of inclination, diameter of medial epicondyle, diameter of lateral epicondyle, bicondylar width, diameter of trochlea, diameter of capitulum, diameter of coronoid fossa, diameter of radial fossa, depth of radial fossa, diameter of olecranon fossa, length from medial epicondyle to capitulum, medial end of A/P diameter of trochlea, A/P diameter of capitulum, angle of retroversion, max length of humerus were highly significant between male and female whereas the other parameters are less significant as their p value > 0.005. **Conclusion:** The results of this study will help in identification of remains of human body to forensic anthropologist and in forensic science.

Key words: Humerus bone, morphometry, sex determination.

Evaluation of Gender Factor on Variations of Posterior Condylar Canal and its Clinical Implications

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ABSTRACT

Background: The posterior condylar canal (PCC) and its associated emissary vein act as important anatomical landmarks for various surgical approaches for exposing lesions in the region lateral to the foramen magnum such as the juxta-condylar approach and extreme lateral approach. The study aimed to provide a complete gender-based assessment of the morphological characteristics of posterior condylar canal in an adult central Indian population. **Methods:** The study was conducted on 130 dry adult central Indian human skulls of known sex (81 males, 49 females). The skulls were assessed for the presence of PCC on both sides, their patency, variations and site of internal opening in relation to important anatomical landmarks i.e., sigmoid sulcus, jugular foramen and foramen magnum. **Results:** Females showed significant higher incidence of bilateral PCC and bilateral probe patency than males and the vice versa was found in case of unilateral PCC. Three morphometric variations in PCC were noted i.e., double condylar canal, septation and spur; which showed no significant gender differences. In both sexes, bilateral intra sinus was the most common type of internal opening of PCC. Significant gender differences in internal opening were also noted in unilateral intra sinus and retro sinus type. **Conclusion:** This study gives knowledge about the comparison of various morphological variations of PCC in both sexes of an adult central Indian population, and its clinical impact on the surgeries of this region.

Keywords: Posterior condylar canal, Emissary vein, Foramen magnum, Arterio-venous fistula.

Sexual Dimorphism of Dermatoglyphic Features in Type 2 Diabetes Mellitus Patients of West Bengal: A Cross-Sectional Study

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Institute / Organization name: ?

ABSTRACT

Background: Dermatoglyphics is the study of epidermal ridge patterns on the fingers, palms and soles. They are the features of genetic trait and does not change after birth. Correlation of dermatoglyphic pattern with many chromosomal abnormalities and genetic pre disposing disease like Diabetes mellitus, Hypertension, schizophrenia, bronchial asthma is evidenced by many researchers. Literatures on Sexual dimorphism of dermatoglyphic patterns revealed it as an important characteristic feature. To study the variance of ridge patterns among male and female patients of type 2 diabetes mellitus patients of West Bengal and determine the sex specific digital and palmar ridge patterns in type 2 Diabetes mellitus. **Methods:** A cross sectional study have been done on 100 male and female type 2 diabetes mellitus patients. Digital and palmar prints were taken by traditional ink method. Digital ridge pattern, Pattern intensity index, Total finger ridge count (TFRC), Absolute finger ridge count (AFRC) and a-b ridge count of the palmar prints were studied. The data on these patterns was recorded and statistically analyzed by Chi square test and Student's t test.

Results: The frequency of ulnar loop is more in female diabetics in comparison to male diabetics. Statistically significant increase in mean TFRC and mean AFRC is seen in male diabetics. **Conclusion:** Our study exhibits that dermatoglyphic pattern significantly differs in male and female diabetics. The knowledge and reference range of dermatoglyphic parameters among male and female diabetics are essential in use of this study as screening tool or diagnostic tool in type 2 diabetes mellitus.

Keywords: Dermatoglyphic study, Type 2 diabetes mellitus, Sexual dimorphism, digital pattern, Total finger ridge count, absolute finger ridge count

Study of Lip Print and its Correlation with Gender and Blood Group among the Students of UIMS, Prayagraj

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ABSTRACT

Background: Identification of an individual is his birth right which is necessary for personal, social and legal reasons. There are certain methods which is used for personal identification such as anthropometry, dactyloscopy, DNA test, fingerprinting, sex determination, estimation of age, measurement of height, post-mortem reports, blood groups, and lip print. This study is undertaken to correlate the lip print pattern with gender and ABO blood group. **Methods:** After getting the ethical clearance from the Institutional Ethical Committee and informed consent of the participant the study was carried out on 150 subjects (86 male and 64 female) among the students of UIMS Prayagraj. Lipstick was applied on the lips and print was taken on bond paper, the prints were divided into four quadrants and were analyzed by using magnifying lens and Suzuki and Tsuchihashi classification were used to identify the most common type of pattern among the students of UIMS. To identify the blood group of study subjects, a drop blood of each subject was placed on a slide and mixed with anti-A, anti-B, and anti-Rh sera. **Results:** It was found that the common lip print pattern in male was Type – III (39%) and in female was Type II (34.5%). The most common blood group was B⁺ and O⁺. **Conclusion:** The present study did not show any statistical correlation of lip print pattern with gender and ABO blood groups. **Keywords:** Cheiloscopy, ABO blood group system, Identification, Correlation.

Cleft Lip and Cleft Palate

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ABSTRACT

Background: Cleft lip and cleft palate are orofacial cleft, is a group of condition that includes cleft lip, cleft palate, and both together. Among 15 types of orofacial clefting, cleft lip and palate is most common one. Cleft lip and palate formed between the 5th and 8th weeks of gestation. Both cleft lip and palate can diagnosed prenatally by ultrasound. Treatment includes cleft lip repair, cleft palate repair, speech evaluation and bone grafting. With appropriate treatment outcomes are good. **Methods:** The data is collected from SSG Hospital, Baroda and Mahatma Gandhi Hospital, Jaipur. **Result:** This study gives us to better understand the role of continuity of care in the cleft lip and palate and to anticipate the needs of these patients and provide for their comprehensive care. **Conclusion:** Common congenital malformation. Reported incidence varies from 1 in 500 to 1 in 2500 live birth. Male:Female ratio is 2:1. Asian population have higher incidence compared to caucasian population. Timeline for cleft surgeries: Primary correction- Lip surgery by 3 months, Palatal cleft surgery by 6-18 months. Secondary correction- Pharyngeal flap. 25% of cases improves velopharyngeal competence. Done between 6-12 year. The goal of surgical approach is to establish good function through care full muscle reconstruction, which will permit optimum growth and development of facial skeleton

Key words: Cleft Lip, Cleft Palate

Macroscopic Changes in the Placenta in Hypertensive Disorders of Pregnancy in Indian Women-A cross-sectional study

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ABSTRACT

Background: Hypertension is a common complication in 6-10% of pregnancies and is one of the leading causes of maternal and foetal morbidity and mortality. There are significant pathological changes seen in placenta before affecting the foetus. This study is comprehensive and has compared individual placental macroscopic changes with the clinical, biochemical, and neonatal outcomes in normal and different groups of women with hypertensive disorders of pregnancy. **Methods:** This is a cross-sectional study conducted for one year with a sample size of 43 each, in both control and study group at M.S. Ramaiah Medical College, Bangalore. The placental morphological parameters, routine biochemical tests, and neonatal outcomes of both groups were analyzed statistically. Descriptive statistics such as mean and standard deviation was computed and compared using independent sample 't' test. **Results:** The study group showed higher incidence of central insertion of umbilical cord; lower values of placental weight, circumference, surface area, thickness, number of cotyledons and higher incidence of calcified areas and retro placental clots compared to the control group. Patients with eclampsia showed a marked reduction in the placental parameters and elevated serum creatinine. The preeclampsia patients showed higher values of liver enzymes, lower values of platelet count and higher incidence of IUGR babies. The Appropriate for Gestational Age (AGA) babies were found in 88.3% and 46% pregnancies in the control and hypertensive group respectively. There was no difference in the foetal weight in both groups and pregnancies with placental weight < 450 gm were found to be associated with poor foetal outcome. **Conclusion:** This study stresses the importance of placenta examination and research by a trained professional for proper knowledge of causes of poor pregnancy outcomes thereby ensuring better preventive, diagnostic and therapeutic approaches in complicated pregnancies.

Key words: Placenta, foetus, Pregnancy induced hypertension, calcification, Eclampsia, Preeclampsia.

Morphological Study of Umbilical Cord in Fetal Growth Restriction

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ABSTRACT

Background: Umbilical cord connects placental circulation with fetal circulation. It acts as nutritional channel between mother and fetus. Cord length is influenced positively by both the volume of amniotic fluid and fetal mobility. Fetal growth restriction (FGR) is a global phenomenon which is associated with significant neonatal morbidity and mortality. Fetuses with birth weight less than 10th percentile of those born at the same gestational age or two standard deviations below the population mean is considered as FGR. **Methods:** This work was carried out in department of Anatomy, Koppal Institute of Medical Sciences, Koppal, Karnataka on 20 cases and 20 controls after obtaining ethical clearance from the institute. The cord length was measured using elastic measuring tape, thickness with vernier caliper's and infant meter to measure neonate's length. Pearson correlation coefficient was applied to find the association between variables. **Results:** When the length of neonate was correlated with length of cord and thickness the r value showed 0.166 and 1.74 respectively. The p value was >0.05 which was statistically not significant. **Conclusion:** No correlation between cord length, thickness and length of neonates. Length of neonates depends on intrauterine nutrition and other factors.

Key words: Fetal growth restriction, umbilical cord, morphology, nutrition and birth weight

Macroscopic Study of Placenta in Intrauterine Growth Restriction

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ABSTRACT

Background: Placenta is a functional unit between mother and fetus. Placenta plays a key role in maintenance of pregnancy, growth and development of fetus. Malfunction of placenta causes fetal abnormalities, preterm deliveries, pre-eclampsia and intrauterine growth restriction (IUGR). Morphological and histopathological changes interfere with normal function of placenta. New born size is the result of intrauterine growth. IUGR is a clinical condition where the estimated neonatal weight is less than 10th percentile. **Methods:** This postnatal study is carried out in Department of Anatomy, SVS Medical, Mahbubnagar, and Telangana after taking institutional ethical committee clearance. 40 placental samples (20- normo tensive; 20- IUGR) were collected, rinsed thoroughly under running tap water. Membranes and cord were trimmed and the measurements were recorded. Mean and standard deviation was calculated between normal and IUGR. **Results:** In IUGR the mean and SD of neonatal weight was 1498±628.19, placental weight was 379 ±51.08, no. of cotyledons were 13.8±3.56. Maximum diameter showed mean and SD of 17.5±3.06. Thickness at the center showed a mean and SD of 2.52±0.55. Placental coefficient showed a mean and SD of 0.29±0.12. In normal cases the mean and SD were more when compared to IUGR. **Conclusion:** Placental parameters reading was less in IUGR when compared to normal. Placental coefficient was more in normotensive when compared to IUG.

Key words: Placenta, intrauterine growth restriction, intrauterine growth, preeclampsia, preterm deliveries.

A Comparative Study on the Growth Rate of the Thymus and Suprarenal Glands of Human Fetuses at Different Gestational Weeks a Graphical Analysis

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ABSTRACT

Background: The present study was conducted to find out a relationship of the growth rate of thymus, suprarenal glands (both left and right), thymus weight/body weight ratios and suprarenal glands weight/body weight ratios of human fetuses at different gestational weeks. **Methods:** The study was carried out on 89 fetuses of different gestational ages ranging from 9 to 40 weeks obtained from the Department of Obstetrics and Gynaecology of Regional Institute of Medical Sciences Hospital, Imphal, India. The gross morphological parameters such as weights of fetus, thymus, suprarenal glands (both left and right) and corresponding organs SD values were calculated and ±weight/body weight ratios were noted. Their mean measured. The data were statistically and graphically analyzed. **Results:** The thymus growth rate from 14 to 40 weeks was found increasing faster as compared to that of left and right suprarenal glands. The growth rate of left suprarenal gland from 22 weeks onwards was also found increasing at a faster rate than that of right suprarenal gland. There was almost a similar gradual growth rate from 22 to 40 week for both left and right suprarenal glands, with the left suprarenal gland increasing at slightly faster rate as compared to right suprarenal gland. **Conclusion:** There was a gradual growth rate from 22 to 40 week for both left and right suprarenal glands, with left suprarenal gland increasing at slightly faster rate when compared to right suprarenal gland. There was a gradual increase in thymus weight/body weight ratio from 20 to 30 gestational weeks and then the ratios remained almost constant upto 40 week and in case of suprarenal weight/body weight ratio, there was a gradual decrease from 22 to 30 week and then became almost constant after 30 weeks. The findings had corroborated and

substantiated with the previous findings of different workers and at the same time also contrasted partially with the findings of previous workers.

Key words: Human fetus, thymus, suprarenal glands, gestational weeks, thymus weight/body weight ratio and suprarenal weight/body weight ratio.

Non-Invasive Method of Estrous Cycle Estimation – An Ideal Tool to Evaluate Reproductive Disorders in Swiss Albino Mice

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ABSTRACT

Background: Evaluation of estrous cycle in laboratory animals can be a useful measure of the integrity of hypothalamic-pituitary-ovarian reproductive axis. Evaluation of vaginal cytology is crucial to assess the reproductive disorders among experimental animals. In the present study, a novel non-invasive method of estrous cycle estimation through vaginal lavage was performed in the swiss albino mice. **Methods:** In the present study, 36 female swiss albino mice were used. 24 animals were subjected for the development of reproductive disorders through insulin resistance (IR) and obesity models (12 animals for IR and 12 for obesity) and the remaining 12 were maintained as the control group. The duration of the experiment was 12 weeks in which time estrous cycle by non-invasive vaginal lavage method was estimated in them as an adjunct parameter. At the end of the experiment the animals were sacrificed by the administration of ether. Biochemical and histopathological analyses were done and statistically analyzed. **Results:** The endometrium showed gross pathological changes which could be correlated to the hormonal imbalances seen in the animals. These findings have also been illustrated with the variations in the estrous cycle of animals. **Conclusion:** The present study concludes non-invasive method to be an ideal tool to understand the underlying hormonal changes during the experiment since this novel method precludes the possibilities of stress, prolonged physical restraints of conventional methods which could confound the experiment.

Keywords: Vaginal cytology, estrous cycle, vaginal cell morphology, reproductive cycle

Bromodomain Extraterminal Family Inhibitor JQ1 Inhibits Nuclear Maturation and Cytoplasmic Organization in Oocytes

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ABSTRACT

Background: JQ1 is a cell permeable small molecule which is a potent inhibitor of Bromodomain and extraterminal (BET) proteins. Bromodomain proteins are known as epigenetic readers which specifically bind to acetyl lysine recognition motifs on histones and play a pivotal role in the cellular proliferation and transcription activation. BET proteins are necessary for the completion of oogenesis and play a significant role in oocyte maturation as well as pre and post-implantation embryo development. So far in the literature, there is no information on the effect of BET inhibitor JQ1 on oocyte function and early embryo development. Therefore, the present study was designed to understand the impact of the presence of broad spectrum bromodomain inhibitor JQ1 on the oocyte maturation and early embryo development. **Methods:** Germinal vesicle (GV) stage oocytes were collected from 8-week old Swiss albinomice and randomly segregated into control (C), vehicle control (VC, 0.01% DMSO in IVM media) and JQ1 groups (25, 50 and 100 µM). The oocytes were cultured for 24h to assess the nuclear maturation. The MII oocytes were fixed and assessed for actin and spindle organization, chromosome alignment, acetylation level and intracellular reactive oxygen species (ROS) level. **Results:** The maturation (MII) rate was significantly (p<0.001) lower in the oocytes exposed to JQ1. In addition, non-significant increase in the

fragmentation and degeneration of oocytes was observed in JQ1 group. MII oocytes from JQ1 group had higher percentage of aggregated F-actin distribution pattern, abnormal spindle organization and misaligned chromosomes. JQ1 exposed oocytes had lower lysine acetylation level and high intracellular ROS level in MII oocytes. **Conclusion:** BRDT inhibitor JQ1 inhibits the oocyte maturation and affects the cytoplasmic organization of the oocyte. **Key words:** JQ1, BET inhibitor, oocyte, cytoplasmic organization.

Morphometric Study of the Orbit in Human Dry Skulls Using Image J Software

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ABSTRACT

Background: The knowledge of bony orbit is very important for ophthalmologist, neurosurgeons and maxillofacial surgeons. Orbital index shows lot of variations in different Races and population. Orbital index has been used in forensic medicine to determine the sex of a person. **Methods:** It is a cross sectional study conducted on 100 adult dry human skulls available in the Department of Anatomy, JNMC, DMIMS, Wardha, Skulls with out any craniofacial malformations or fractures were excluded from the study. The Orbital length, Orbital Breadth were measured directly from digital images by image analysis software Image J developed by National Institute of Health, United states. The Orbital Index was calculated using formula- orbital length/orbital breadth $\times 100$. **Results:** In the present study it was found that the mean orbital length is 32.4 mm on right and 32.7 mm on left side, while orbital breadth on right was found to be 37.2 mm and 37.5 mm on left side. Mean orbital index was found to be 87.09 mm on right and 87.2mm on left side. **Conclusion:** The our study establishes the reliability of using Image J software for orbital morphometric studies instead of conventional measurement tools like vernier callipers and scale. This study provides orbital morphometric data, for ophthalmologist, maxillofacial, and plastic surgeons. The knowledge of orbital index is very important in forensic medicine for determining gender and ethnicity.

Keywords: Orbit, morphometric, orbital index, maxillofacial

Plastination Method versus CECT Scan Method in Determination of Vascular Variants of Liver Segments

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ABSTRACT

Background: The liver is a highly vascular organ which has dual blood supply, 25% to 30% supplied by hepatic artery and 70 to 75% supplied by portal vein. Liver is drained by three major hepatic veins: right, middle and left hepatic veins which ultimately drains into inferior vena cava. Liver transplantation is technically demanding, and crucial peri operative management is needed for successful outcome to prevent morbidity and mortality of patients. The present study aims to review the normal distribution and vascular variation of liver by cast method and contrast enhanced CT scan method and their predictive accuracy. To evaluate the specificity and sensitivity in detection of vascular variants in the liver by cast and CECT scan method. **Methods:** 80 livers used in this study was retrieved from post-mortem examination done on blunt abdominal trauma death cases from the Departments of Forensic Medicine of JSS Medical college and Mysore Medical College. The liver was resected and coloured silicone was injected into coeliac trunk, portal vein and openings of hepatic veins in inferior vena cava. The soft tissue of liver was dissolved and the variations of vascular anatomy was observed. Retrospectively CECT scan images of deceased was collected from the Radiology Department of respective hospitals. Axial and post processed 2D and 3D reformations contributed for accurate evaluation. **Results:** Sensitivity and accuracy of cast method in identification of vascular variants of liver were higher than compared to CECT scan method. Specificity and Positive predictive

value was 100% in identification of variations of major hepatic veins by cast method compared to CECT scan method. **Conclusion:** The cast method simulates CT angiography and provides accurate information of existing vascular variants of vessels which cannot be delineated by contrast enhanced CT scan method.

Key words: Liver segments, Cast method, CECT method

Stereological Evaluation of Umbilical Vessels in Pregnancy Induced Hypertension and its Comparison with Normal Pregnancy

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ABSTRACT

Background: Pregnancy Induced Hypertension is often associated with histopathological changes in relation to umbilical cord which is often associated with poor fetal outcomes. The histo pathological analysis of 2-D profiles is now replaced with 3-D stereological estimation which is more precise and free from assumption bias. To do a stereological evaluation of umbilical vessels of umbilical cords obtained from term pregnant females having pregnancy induced hypertension (PIH) and compare it with that of the normal term pregnant females. **Methods:** The study was done on 62 umbilical cords, 31 from normo tensive mothers and 31 from PIH mothers. Serial sections of the umbilical cords were stained with hematoxylin and eosin (H&E). Systematic uniform random samples of umbilical cord sections were identified under microscope and unbiased stereological and histological study was performed using Stepanizer app M-42 test system superimposed. **Results:** The mean length and diameter of the cord in PIH was reduced. Umbilical artery showed contracted lumen, thickening of wall. Umbilical vein had dilated lumen and thinning of the wall. **Conclusions:** PIH significantly effects the morphology and histology of umbilical cord in such a way that it leads to hemodynamic compromise in the fetus and can lead to adverse outcomes like low birth weight.

Keywords: Stereological evaluation, Pregnancy induced hypertension, Umbilical cord, Umbilical artery, Umbilical vein, Term pregnancy, Normo tensive.

Luminal Cast Plastination of External Auditory Canal as a Teaching Model

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ABSTRACT

Background: Anatomical models are 3 dimensional, homologous models which present anatomical structures life size or enlarged form. These models not only serve as display material but are also used for mastering medical techniques. Models allow students to touch, feel and look closely at them. Plastination is a technique which uses polymers such as resin and silicone in order to create life-like specimens or models which allow realistic visualization of anatomical aspects that are simply too difficult to describe. The study aims to create a plastinated silicone cast of external auditory canal as a teaching model for students. **Methods:** 8 cadavers were obtained and the external auditory canals were cleaned. Silicone was injected into the canals and the casts were obtained. **Results:** The casts so obtained were observed for their S shaped curvature and the two constrictions were also noted. **Conclusion:** The silicone cast can be used as a museum specimen, to communicate with patients to create awareness about disease process, to educate the public especially in cases of management of deafness and for medical students in surgical training and experimental otological surgeries.

Key words: Plastination, EAC- External Auditory Canal, Models.

Mounting Specimens after Coating with Liquid Silicone –A New Innovative Method

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ABSTRACT

Background: Dissection is the most useful way of learning anatomy. A well dissected specimen is mounted and stored in formalin filled acrylic or glass jars. These specimens form the important part in the anatomy museums. After mounting the specimens the margins and borders of these anatomical structures are not very well seen as the minute connective tissue fibers float in the formalin solution. Many studies have shown using different chemicals like amylocetate, fevikwik and other materials which are applied or coated on the specimens to obtain a well-defined margins or borders and later mounted in jars. The results are not very satisfying. **Methods:** In our study we have used liquid silicone to coat the specimens before mounting. **Results and conclusion:** Specimens coated with liquid silicone and then mounted looks better and the connective tissue fibers which are floating are not seen making the margins of the structures appear better and well displayed for viewing.

Keywords: Amylocetate, silicone

Novel Technique to Preserve Coloured wet Specimen in Anatomy Museum

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ABSTRACT

Background: Human Anatomy is an indispensable subject in the medical curriculum, dealing with the structural organization of human body. The museum plays a dominant role in learning the subject precisely by displaying the well mounted specimen. A colorful wet specimen plays a significant role to enhance the interest of learning. A student may acquire ample information about the normal anatomical structure and any variation in vessels and nerves by using colored specimen. The specimen has to be fixed before the coloring and mounting. **Method:** The present study was conducted on 20 wet specimens taken from well embalmed cadavers in the department of Anatomy, Government Medical College, Pali (Rajasthan). We used Feviacrylic colors to paint the specimens. The painted specimens were kept in the Museum Jar Solution formed by 10% Formalin, Glycerol and Water in the ratio of 1/5th, 2/5th and 2/5th respectively. We also added Phenol Crystal in traces amount. In few Specimens we also used wax strip to support the delicate structure like vessels & nerves. By using the wax strip, vessels & nerves could not float in the solution and remain in the same life like direction for better understanding of specimen. **Result:** The colored specimens kept in the museum jar filled with formalin solution remains stable without any color fading as since last three and half year. **Conclusion:** Use of acrylic color to paint the wet gross specimen is the easiest, cost effective and nontoxic method to make specimen attractive, create great interest and aid in better understanding of the subject.

Key words: Wet specimen, Acrylic color, Museum, Formalin solution.

Study of Anterior Cardiac Veins in Human Heart – Cadaveric Study

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ABSTRACT

Background: The anterior cardiac veins are known in the 'Nomina anatomies' as venae cordis anteriores. They are superficial veins of the heart, opening directly into the right atrium separately from the veins draining to the coronary sinus. Anterior cardiac veins originate and drain the anterior right ventricular wall, travel superiorly to cross the right AV sulcus, and enter the right atrium directly. Anterior cardiac veins pass superficial to the right coronary artery. The aim of present work is to study the morphology of anterior cardiac veins. **Methods:** The study was performed in the Department of Anatomy, SRMS IMS, Bareilly on 30 hearts from embalmed cadavers. The hearts were procured from the cadavers (age ranging from 15 to 65 years) available in the department of Anatomy SRMS IMS, Bareilly. The number of anterior cardiac veins were noted. **Results:** Anterior cardiac veins were seen to drain

directly in to the right atrium. Out of 30 cadaveric hearts the anterior cardiac vein was found 3 in number in 7 hearts (10%) and it was found 4 in number in 6 hearts (13.33%). In 12 hearts it was found 2 in number and in 4 hearts it was found 1 in number. There was single heart out of 30 where anterior cardiac veins were found 5 in number (3.33%). Number of anterior cardiac veins present in the heart was having significant relationship with weight of cadaver in males ($r=0.498$, p value= 0.0183) whereas it was insignificant in females ($r=-0.429$, $p=0.288$). **Conclusion-** With the advent of interventional cardiology, the cardiac venous system and its variations are important for different procedures.

Keywords: Cardiac, veins, anterior, heart

A Cadaveric Study on Morphology and Morphometry of Pectoralis Minor Muscle

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ABSTRACT

Background: Shoulder illness is a common clinical presentation and can be due to anatomical variations such as anomalous insertion of the pectoralis minor tendon to the gleno humeral joint capsule. Hence, knowledge of variants is important for the clinician for diagnosing and treating patients to prevent the misdiagnosis and iatrogenic injury. The objective is to study the pectoralis minor muscle (PMi) along with assessment of its dimensions and to note any variability in its morphology. **Methods:** The study was carried out on 30 upper limb specimens (Right 15 & Left 15) of both sexes available in department of anatomy. The width and length of the muscle and width at the insertion were noted along with any variations in its origin, insertion, nerve supply and fusion with the coracobrachialis muscle. **Results:** We have observed following variations at origin: in 86.6% from 2 to 4 ribs, 6.6% from 2 to 5 ribs and 6.6% from 3 to 5 ribs. Variations at insertion: in 76.6% it was inserted to coracoid process, in 20% fused with coracobrachialis muscle, in 3.3% fused with pectoralis major muscle. The average length of the muscle from the sternocostal junction of the inferior aspect of the fourth rib to medial border of the coracoid process was found to be 13.7cm, and the average width of the muscle at mid-clavicular line was found to be 6cm and average width of the tendon at the insertion was found to be 1.6cm. **Conclusions:** The knowledge regarding PMi muscle is imperative for surgeons in performing surgeries in pectoral region especially around the axillary artery and cords of brachial plexuses.

Keywords: Pectoralis minor, morphology, morphometry, variations

A Cadaveric Study on Morphology and Morphometry of Pectoralis Major Muscle

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ABSTRACT

Background: The Pectoralis Major (PM) muscle is considered as one of the key anatomical structures in plastic and reconstructive surgery. The objective is to study the morphology of PM along with a thorough assessment of its dimensions and to note any other anatomic variations. **Methods:** The study was carried out on 30 upper limb specimens (Right 15 & Left 15) of both sexes available in department of anatomy. The morphometric analysis at the origin and insertion was done and the muscle was thoroughly observed for any other anatomical variations. **Results:** We observed that the entire length of the clavicle gave origin to the clavicular head in 6.6% of the specimens and the delto-pectoral groove was absent in 6.6% of the cases. 66.6% of the specimens showed the continuation of the pectoralis muscle at its insertion along with the brachial fascia. In 3.3% of the cases, the three heads of the pectoralis major were not distinguishable. The mean height at the mid clavicular line was found to be 13.8 cm and at the mid axillary line it was found to be 6.6 cm. The average width was found to be 18.7 cm at the origin. The average length at the insertion was found to be 4.8cm and the height was found to be 0.89cm. **Conclusions:** The

knowledge regarding pectoralis major is imperative for surgeons in performing surgeries in pectoral region specially the surgeries involving mammary gland.

Keywords: Pectoralis major, morphology, morphometry, variations

The role of Osborne Ligament in Causing Ulnar Nerve Compression –An Anatomical Study

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ABSTRACT

Background: Among the peripheral nerves of the upper limb, ulnar nerve is more vulnerable to stretching and compression with motion of the upper limb at 6 potential sites. Osborne ligament is a noted eponymous structure, extending between the medial epicondyle and the olecranon process, which could potentially induce extra-neural pressure on the ulnar nerve. The aims of the present study were to observe the different morphological patterns of Osborne ligament alongside exploring the relationship between them and ulnar nerves at the cubital tunnel during different degrees of elbow flexion. **Methods:** 30 formalin embalmed cadaveric upper limbs were dissected and Osborne's ligament (if present) were classified based on O Driscoll's classification. Subsequently, the tautness of the ligament and the variation of the length of it with respect to these angles at different degrees of elbow flexion (20°-140°) were measured. The results were tabulated and analysed using appropriate statistical methods. **Results:** 20/ 30 limbs had type 1b pattern (O Driscoll's) of Osborne ligament and in 7/30 limbs Osborne ligament was absent (type 0). The origin-to-insertion length of the ligament along with ulnar nerve length (i.e. tautness) increased significantly with increasing flexion angle. Both lengths at 90° and 120° of elbow flexion were greater than at 20° or 40°. **Conclusion:** Understanding the dynamic anatomical relationships of the cubital tunnel might help in the safe treatment of ulnar nerve compression using anterior nerve transposition techniques and analysing the post-surgical MRI images of cubital tunnel area.

Keywords: ulnar nerve, Osborne ligament, nerve compression

Papillary Muscles and Chordae Tendineae of left ventricle: A Cadaveric Study

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ABSTRACT

Background: Knowledge of anatomy of papillary muscles are important as its proper functioning maintain the integrity of mitral valve. Anatomical configuration of the papillary muscles and chordae tendineae may influence the reconstruction of the sub valvular apparatus and homograft implantation. Therefore, present study aimed to know the variations and normal anatomy of papillary muscles and chordae tendineae in the left ventricle of the human hearts. **Methods:** The material consisted of 56 formalin fixed adult cadaveric apparently normal hearts belonging to either sex obtained from Department of Anatomy, King George's Medical University, Lucknow. The hearts were dissected carefully to open the left ventricle and to expose papillary muscles and chordae tendineae. **Results:** Four different shapes of papillary muscles were identified – conical, flat-topped, cylindrical, bifurcated, trifurcated and H-shaped. We also discovered various patterns of papillary muscles as parallel, interlinked and flat. Variation in the number of papillary muscles was also noted- classical picture of two papillary muscles with a single base and a single apex; two groups with multiple bellies; three groups and four groups. Origin of papillary muscles was maximum from middle third of ventricular wall. Different patterns of chordae tendineae as interpillar, commissural, strut, marginal and rough zone chordae. **Conclusion:** We have found considerable variations in the number, shape, pattern and origin of the papillary muscles. There is a clear need to conduct future large-scale studies in different regions of the world including specimens from individuals with mitral valve prolapse, dilated cardiomyopathy

and left ventricular outflow tract obstruction in order to investigate the reasons behind each specific pattern.

Keywords: Papillary muscles, chordae tendineae, left ventricle, mitral valve

Incidence of Patterns of Bony Modification of Neck of the Talus in Indian Population

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ABSTRACT

Background: The present study is an attempt to determine the various types of bony modifications on the dorsum of the neck of the human tali of both feet due to the continuous habit of squatting in humans and correlating these findings to the existing literature. **Methods:** 70 tali of unknown sex, obtained from the Department of Anatomy of MVJ Medical College and Research Hospital, Bangalore were used for the study. The dorsal surface of talar neck was carefully examined for the presence of medial and lateral squatting facets, combined facets, continuous gutter shaped facets and extension of trochlear surface. The collected data were tabulated and percentage of each facets and trochlear extensions were calculated. Statistical analysis of data was performed. **Results:** Out of 70 dry human tali, lateral squatting facets were present in 29 (41.4%) bones and medial squatting facets were seen in 11 (15.7%) bones, gutter shaped facets in 12 (17.1%) tali and combined facet present in 10 (14.2%) tali. Complete absence of facet was observed in 8 tali. Lateral extension of trochlear surface on the dorsum of neck was seen in 60 (85.7%) bones and medial trochlear extension was seen in 8 (11.5%) bones. Lateral squatting facets were more common on right side but medial, gutter and combined facets though less frequent were seen more on left side. Lateral extensions were more commonly seen than medial extensions. **Conclusion:** The knowledge of incidence of these modification on the dorsal surfaces of neck of the talus acts as a key anthropological factor to identify the racial and regional origin of unclaimed skeleton. Hence the results of this study will be of great help for forensic experts, anthropologist who are handling the unidentified skeletons.

Keywords: Squatting Facets, Talus, Trochlear extensions, Sub Talar Joint Stability

Morphometric & Morphological Analysis of Carotid Canal External Aperture in Human Adult Neurocranium

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ABSTRACT

Background: Carotid canal is the passage way in the temporal bone and transmits the Internal carotid artery along with the carotid plexus of nerves into the cranium. Fracture through the petrous segment of the carotid canal is related with quite a high occurrence of carotid injury. **Methods:** Study was carried out in 200 cranium (unknown sex) of Indian population. Disparities in Shapes of Carotid canal (Ext. Aperture) were noted & Digital vernier callipers is used to appreciate Anteroposterior & mediolateral diameters of both sides from which Areas were procured & evaluated statistically. **Results:** Round shape of Carotid canal (Ext. Aperture) was observed in 54%, oval shape in 28% & almond in 18% of the crania. Dimensions for the right side (APD, TD & Mean) were 6.8 + 1.27 mm, 5.94 + 0.91 mm, 31.89 + 8.37 mm and the left side was 6.77 + 1.39 mm, 6 + 0.91 mm 32.16 + 8.33 mm respectively. **Conclusion:** Awareness of carotid canal measurements could assist neurosurgeons in surgical operations, the clinicians in radiographic scrutiny, & also for the clinical anatomists and the forensic experts in their routine practice.

Keywords: Cranium, Carotid canal External Aperture, Morphology & Morphometry

The Unusual Presence of Wormian Bones or Intra Sutural Bones in the Lambdoid Suture of Human Skulls- A Study

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ABSTRACT

Background: This study is done on the skulls collected from museum about 10 [ten] in number; we observed intra sutural bones in the lambdoid suture. **Methods:** Length and width of the sutural bone are measured with Vernier calipers. **Results:** Mostly they are found in osteogenesis imperfect and they are formed by extra ossification centres for them. They are also found at other sites like sagittal suture, and parietal suture and in paediatric skull at fontanelles. **Conclusion:** A number of greater than 10 intra sutural bones in the same skull vault is significant of underlying disease like Rickets or Osteogenesis imperfect or hypothyroidism or hypophosphatasia etc.

Keywords: Wormian bones/ intra sutural bones; lambdoid suture

Axillary Arch Muscle – A Cadaveric Study

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ABSTRACT

Background: The latissimus dorsi is a large broad sheet of muscle of the back. Occasionally some muscle slips arises from its lateral border, crosses anteriorly the neurovascular structures in the axilla and get inserted with the tendon of the pectoralis major. This is known as Axillary arch or Langer's muscle. This muscle has got many clinical interests as it can lead to axillary vein entrapment, compression of neurovascular and lymphatic structure and may interfere in the surgeries involved in the axillary region. **Methods:** The present study was conducted on 50 adult upper limbs (25 right and 25 left) of both sex, fixed in 10% formalin solution, collected from the Department of Anatomy, Mysore Medical College and Research Institute, Mysore. The axillary region was carefully dissected, the axillary arch muscle if present, its dimension, nerve and vascular supply was carefully noted. **Results:** In out of 50 specimens, we observed bilateral presence of axillary arch muscle in one cadaver i.e. in two specimens, which accounts for 4%. **Conclusion:** The present study adds up to the existing knowledge regarding the occurrence of the axillary arch muscle, as it can lead to the various clinical conditions and also this knowledge is helpful in various surgeries involved the axilla

Keywords: latissimus dorsi, pectoralis major, axillary arch, neurovascular compression

Presence of Clavicular Facet in Coracoclavicular joint in Human Clavicles

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ABSTRACT

Background: Coracoclavicular joint (CCJ) is an anomalous synovial articulation between conoid tubercle of clavicle superiorly and the superior surface of the coracoids process of scapula inferiorly. It is used as an anthropological marker for human migration. It is being considered responsible for restriction of shoulder joint movements, degenerative changes of joints of pectoral girdle and undiagnosed shoulder pains. The present research was undertaken to find out the presence of the clavicular facet on the conoid tubercles of the fully ossified adult clavicles. **Methods:** The present study was carried out in the Department of Anatomy, Pt. B D Sharma PGIMS, Rohtak; Haryana. It included 88 adult human clavicles of known sex. Out of 88 clavicles, 56 were male clavicles and 32 female clavicles. The presence of CCJ was determined by examining the occurrence of a distinct articular facet on the conoid tubercle. **Results:** In the present study, the articular/clavicular facet on the conoid tubercle was observed in 6 clavicles. Out of 6 articular facets, 3 were present in male clavicles and 2 were in female clavicles. **Conclusion:** Presence of CCJ predispose to degenerative changes of the sterno-clavicular and acromio-clavicular joints. The knowledge of this joint is important for surgeons and orthopedicians for identifying the cause of

undiagnosed shoulder pain and steps which followed for managing and treating this condition.

Keywords: Clavicle, Conoid, Facet, Orthopedicians, Tubercle

Morphometric Analysis of Distal End of Adult Dry Femur of Indian Population and its Clinical Significance

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ABSTRACT

Background: The human knee is the largest and most complex joint in the body. The distal end of femur morphometry is vital in designing the implants for total joint arthroplasty and lessen the complications after knee surgery. This research on distal end of femur anthropometry is needed with growing trends in knee arthroplasty as a treatment of choice for degenerative knee alignments. **Methods:** This study has been done on 90 dry adult femur bones of unidentified sex from department of anatomy of Deccan College of Medical Sciences, Hyderabad, Telangana. Six parameters related to lower end of femur were studied and analysed statistically. **Results:** The mean bicondylar width for right and left femur was 75.95mm and 76.17 mm respectively. The mean for lateral condyle anteroposterior length was 50.74mm on right side and 59.89mm on left side. The mean for maximum transverse distance of lateral condyle was 24.06 mm on right side and 24.52mm on left side. The mean for maximum anteroposterior length of medial condyle was 57.79mm on right side and 59.49mm on left side. The mean for maximum transverse distance of medial condyle was 24.58mm on right side and 23.85mm on left side. The mean intercondylar notch width was 18.87mm on right side and 20.12mm on left side. **Conclusions:** This data is collected by direct measuring systems and compared with other studies proves ethnic variations between different populations. This morphometric data will help in designing of implants suitable for Indian population and will minimize mismatch and increase clinical outcome. Presently available prosthetic components are designed primarily based on the western population but numerous studies have shown that Asian ethnicities have smaller knees due to shorter physiques.

Keywords: Lower end of femur, intercondylar notch width, knee joint, morphometry, arthroplasty.

Morphometric Study of Dry Sternum

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ABSTRACT

Background: Sternum the main protective bone of vital organs. The purpose of the study is to assess the shape, size, Length, Breadth, thickness of manubrium, body of the sternum, xiphoid process. To find out the site, shape whether oval, round or elliptical, presence, absence, accessory, complete, incomplete and number of sternal foramina. **Methods:** A total of 65 sternums were obtained from the department of anatomy Shri Sathya sai Medical College and Research Institute, Chennai. The bones were examined macroscopically and all the measurements the maximum minimum diameter mean value were measured by using a digital vernier caliper of precision 0.01mm. The photos and readings were documented separately for statistical purpose. Statistics- Mean, standard deviation, ANOVA. **Results:** Out of 65 sternum, 53 were normal in which 17 bones shows the presence of sternal foramen. 5 foramens at the body of sternum. Most of the foramen showed oval shape. Presence of double foramen in two. In two, the length of the body of the sternum varies. Trapezoid and quadrangular shape of manubrium sterni commonly noticed. 3 bones shows large, bifid xiphoid process. **Conclusion:** The study concludes variations in shape and size of sternum were largely noticed in manubrium and xiphoid process and least in body of sternum. The anatomical knowledge of features and variations of sternum is important for clinicians before performing procedures like biopsy and radiologists for proper interpretation.

Keywords: Sternum, sternal foramen, xiphoid, Manubrium

Morphometry of Clavicular Facet of the Acromion Process and Degenerative Changes of the Acromion

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ABSTRACT

Background: Morphometric evaluation of the acromion process & associated structures contribute a lot in the pathogenesis of impingement syndrome and instability of the acromioclavicular joint. The aim of the study was to determine the morphometry of the clavicular facet of the acromion process as acromioclavicular joint injuries are very much common especially among the sports professional. We have also observed some of the morphological degenerative changes in the acromion process as they are thought to be responsible for some of the common shoulder abnormalities.

Methods: The observational study was conducted on 110 adult dry scapulae of both sexes from the department of Anatomy, SGT University, Gurugram. The clavicular facet on the acromion process was studied for different parameters like length & width along with the distance of the facet from the tip of the acromion process by a digital vernier caliper. Degenerative changes of acromion like presence of spurs or facets were also examined by visual inspection.

Results: The average values of each parameter were: length of the facet 10.32mm & 10.06 mm on right & left side respectively; width 6.52mm & 5.69mm on right & left side and distance 9.39mm on the right & 8.24mm on the left side. The percentages of the shape of tip of the acromion process was mostly cobra shaped 44.54% followed by square tip 33.63% and least was intermediate type 21.8%. Degenerative changes like spur or facet were present among 28.2% scapulae. **Conclusions:** Our osteometric analysis and morphological evaluation will act as a baseline data for the clinicians especially Orthopaedic surgeons as it will be a great help for them to diagnose the cases and to perform operative procedure of acromioclavicular joint instability.

Keywords: Acromioclavicular joint; acromial facet; morphology; acromial degeneration

Effect of Ultra-Diluted Aconite and Ignatia on Proliferation and Differentiation of Neural Progenitor Cells

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ABSTRACT

Background: Anxiety disorders are highly prevalent and incapacitating psychiatric conditions, which frequently persist unrecognized and untreated. They are common in society, accompanied by increased use of primary health care set up. Complementary and alternative systems are often used to treat mental disorders. Neurotransmitter systems play an important role in causing anxiety disorders. GABA is the main inhibitory neurotransmitter in the central nervous system. The arrival of induced pluripotent stem cell (iPSC) technology has opened a new era of drug discovery and disease modeling. Differentiation of iPSCs into many types of cells including neurons enables relevant assays to develop disease and drug screening. So the objective of this study is to evaluate the efficacy of ultra-diluted Aconite and Ignatia (alternative medicines) on iPSC-derived GABAergic progenitors. **Methods:** It is an in-vitro study. Generation of GABAergic progenitor cells from iPSCs was done. MTT assay was done to study the effect of Aconite 3C and Ignatia 3C on cell proliferation of neural progenitor cells. TUJ1 immunostaining was done to assess the differentiation of neural progenitor cells. **Results:** The ultra-diluted Aconite 3C and Ignatia 3C showed no effect on the proliferation of progenitor neural cells at different concentrations (0.1%, 0.2%, and 0.5%). There was no statistical significant difference between control and alcohol groups. Also there was no

significant difference between alcohol and test drug groups.

Conclusion: The ultra-diluted Aconite 3C and Ignatia 3C showed no effect on the proliferation and differentiation of progenitor neural cells.

Keywords: GABAergic neurons, Aconite, Ignatia, progenitor neural cells.

Neurobehavioral and Biochemical changes in Nicotine exposed Rat Cerebellum

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ABSTRACT

Background: Nicotine, the main component of natural tobacco ingredient. By cigarette smoking, nicotine enters into the body and rapidly enters into the brain by crossing the Blood Brain barrier and produces the behavioral reinforcement. Thus, the present study examined the neurotoxic effect of cerebellum and also the changes in behavioral and motor activities in male Sprague-Dawley Rats.

Methods: The study subject was carried out on 16-male Sprague-Dawley Rats. The Male Sprague-Dawley rats (180-200 grams in weight before onset of experiment) of 12-15 weeks were given nicotine 5 mg/kg body weight for 90 days through oral gavage. Control rats received standard feed pellets and water Ad-libitum. Animals were subjected to behavioral test after the total duration of exposure. Motor activities were evaluated by using Beam walking test and Open field test whereas behavioral activities were recorded by Elevated Plus maze and Open Field Test. After behavioral tests, rats were anesthetized and cerebellum was collected from each rat for biochemical analysis. **Results:** There were significant changes noted in body weight loss and cerebellum weight loss in nicotine exposed rats than the control group. Nicotine exposed rats showed slight alteration in anxiety, freezing time, rearing, grooming than the control rats. And the oxidative stress markers (MDA, NO and GPX) in serum and cerebellar tissues were significantly increased in nicotine treated rats than the control group. **Conclusion:** Based on the present study and supporting literature clearly indicates that Nicotine is toxic to animals and humans from biochemical and behavioral point of view.

Keywords: Nicotine, Cerebellum, Behavior and oxidative stress

Morphometric Parameters of Cruciate Ligaments of Knee and its Correlation - A Cadaveric Study

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ABSTRACT

Background: The knee joint is one of the most important complex and load-bearing condylar varieties of synovial. The joint cavity of the knee is mainly connected by ligaments which are formed by two collateral ligaments on the sides of the knee and two cruciate ligaments like Anterior Cruciate Ligament (ACL) and Posterior Cruciate Ligament (PCL) inside the knee Joint. The site of the attachment of ACL is on the anterior condylar area of tibia with the relation of partly with lateral meniscus. ACL acts as passive restrain for the tibia in the respect of femur and prevent the hyperextension of the knee joint. The PCL acts as primary stabilizer of the knee joint because it acts as principal restrain against posterior tibial translation. **Methods:** 20 cadaveric knees, a digital camera for photography. After dissection of the knee, the ACL and PCL were identified and measuring their different parameters by using black ink marker at their attachment site. The length and width of ACL and PCL of both the knees were noted. All the measurements were taken by digital caliper and length of femur and tibia by measuring tape. **Results:** Descriptive statistics showing that the Mean \pm SD of the Length of ACL of the right and Left knees are 20.80 ± 4.92 & 22.72 ± 3.96 , while in PCL it is 25.60 ± 7.12 & 27.06 ± 5.59 respectively. After analyzing the width of the ACL it is 2.40 ± 4.92 , while in PCL it is 10.31 ± 7.12 & 11.64 ± 2.11 respectively. Statistical analyses showing that null hypothesis accepted after comparing between the length and width of ACL and PCL on both sides of the knee. After comparing the data of cruciate

ligaments with the length of the femur and tibia, we found no correlation between them. **Conclusion:** During the surgical repair of cruciate ligaments, the orthopedic surgeon should have detailed knowledge about the different parameters of cruciate ligaments.

Keywords: Cruciate ligaments, meniscus, synovial joint, surgical reconstruction

A study on the Morphometry of the Crania and to Estimate the Cranial Capacity in an Adult Human Skull Bones

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ABSTRACT

Background: The crania constitute the skull bones with numerous foramina, canals, fissures, processes which are held together by sutures forming the cranial cavity. The configuration of the skull is a reliable indicator for estimating the stature and intelligence of an individual and the cranial capacity that helps to access brain development. The present study helps the forensic anthropologist to differentiate the sex and to predict brain development by measuring the cranial capacity of an unknown skull or with the available skeletal remains. **Methods:** One hundred adult dry human skull bones irrespective of sex, age were studied. The linear parameters like cranial length, breadth was measured using Spreading caliper and cranial height was measured using Anthropometric rod whereas the cranial volume was measured both by direct and calculated methods. **Results:** The mean cranial capacity in male and female skulls was 1246.67 ± 116.60 cc and 1191.63 ± 83.23 cc respectively by using direct method. The mean cranial capacity in male and female skulls by using the calculated method was found to be 1300.91 ± 112.35 cc and 1245.51 ± 79.93 cc respectively. There was a significant difference between the cranial length, breadth and height of male skulls compared to female skulls. **Conclusion:** The cranial capacity in the male skulls was significantly greater than the female skulls. The present study helps anthropologists, forensic experts to use the anthropological examination in medico-legal cases for determining the sex, stature and the cranial capacity to expose the growth and development of the brain of an unknown individual.

Keywords: Cranial capacity, Intelligence, Cephalic index

Facial Anatomy, A Reflection of Personality

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ABSTRACT

Background: Face is the index of the mind", so goes a proverb, which means an individual's characteristics can be inferred from the face. In this study, we tried to discover whether there is a correlation between the anatomy of the face and personality traits. **Methods:** The research was conducted on 211 individuals aged 18-26 years of both sexes. Anthropometric dimensions of Face (Face height and width) were measured using a digital Vernier calliper. The facial index was calculated from the face height and width using the formula, $\text{Face height/width} \times 100$. Personality traits (Psychoticism, Neuroticism, and Extroversion/Introversion) were assessed using the Eysenck Personality Questionnaire (EPQ-R). The above mentioned anthropometric measurements were correlated with the personality traits mentioned above. **Results:** It was found that Facial width was negatively correlated with Psychoticism and the facial index was positively correlated with Psychoticism. There was no correlation of measurements with Neuroticism and Extraversion/Introversion. **Conclusions:** This study shows that Face anatomy can give us an insight into the personality traits of an individual.

Keywords: Face height, Face width, Facial index, Personality trait.

Morphometric & Morphological analysis of Carotid Canal External Aperture in Human Adult Neurocranium

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ABSTRACT

Background: Carotid canal is the passage way in the temporal bone and transmits the Internal carotid artery along with the carotid plexus of nerves into the cranium. Fracture through the petrous segment of the carotid canal is related with quite a high occurrence of carotid injury. To explicate bilateral morphological inequality & morphometric measurements of the Carotid canal (Ext. Aperture) in human adult skulls. **Methods:** Study was carried out in 200 cranium (unknown sex) of Indian population. Disparities in Shapes of Carotid canal (Ext. Aperture) were noted & Digital vernier callipers is used to appreciate Antero posterior & mediolateral diameters of both sides from which Areas were procured & evaluated statistically. **Results:** Round shape of Carotid canal (Ext. Aperture) was observed in 54%, oval shape in 28% & almond in 18% of the crania. Dimensions for the right side (APD, TD & Mean) were 6.8 ± 1.27 mm, 5.94 ± 0.91 mm, 31.89 ± 8.37 mm and the left side was 6.77 ± 1.39 mm, 6 ± 0.91 mm, 32.16 ± 8.33 mm respectively. **Conclusion:** Awareness of carotid canal measurements could assist neurosurgeons in surgical operations, the clinicians in radiographic scrutiny, & also for the clinical anatomists and the forensic experts in their routine practice.

Key words: Cranium, Carotid canal External Aperture, Morphology & Morphometry

A Comparative Study on Variation of Facial Indices in People of Hilly and Terai Areas of Uttarakhand region.

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ABSTRACT

Background: Human face is a specific criterion in personal identification and is a great reflection of uniqueness of each individual. Facial anthropometric indices are medico legally much important but very less research work has been done on hilly and terai people of Uttarakhand region that is why this project is planned. Participants with facial deformities or previous history of facial trauma or surgery will be excluded from this study. **Methods:** This study will be carried in the Department of Anatomy, SGRRIM & HS Dehradun. One hundred persons aged between 21 and 35 years will be analyzed because in this range of age categories the bones are completely grown and stabilized, approximately 5 groups of races in hilly and terai region of people occurs. Methodology: Vernier caliper will be used for different facial indices, measured to the nearest unit in millimeters (mm). **Results:** Measurements and data observed well. Final data output is statistically significant and this observations can be used as reference for future studies in North Indian adult population. **Conclusions:** Facial anthropometric indices are of much importance in plastic surgeries, forensic medicine and anthropometric studies. Hence physical anthropometry provides the techniques to assess and to describe morphological variations that exist among different human population.

Keywords: Facial indices, Anthropometry, Craniometric indices,

Relationship between Quadriceps Angle (Q Angle) with Body Parameters in Sedentaries and Sportsperson

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ABSTRACT

Background: Quadriceps femoris angle of knee is an acute angle reflecting the placement of quadriceps musculature relative to the bony structures; pelvis, thigh bone and shin bone below it in the frontal plane. It reflects pathomechanics and biomechanics of the patellofemoral joint. The purpose of this study was to observe the relationship between Quadriceps angle (Q angle) with body parameters in sedentaries and sportsperson. **Methods:** This study composed of a total of 130 individuals which was divided in two categories; Sedentaries and Sportsperson. Each category consisted

of 65 individuals (35 males and 30 females). Q angle (goniometric method) and body parameters: height (stadiometer), weight (digital weighing machine), BMI and condylar distance (manual caliper) of each participants were calculated. Comparison of body parameters was done by independent t-test. The association between the parameters was investigated by means of Pearson's correlation coefficient. **Results:** There was statistically significant variation ($p < 0.05$) in quadriceps angle between sedentary and sportsperson, sedentary male and sportsperson male and sedentary female and sportsperson female. Both sportsperson males and females had lower value of Q angle than their sedentary counterpart. Females had higher Q angle than males ($p < 0.05$). In this study, negative correlation was found between Q angle and Condylar distance ($p < 0.05$) in both sedentary and sportsperson. **Conclusion:** Females on both categories, sedentary and sportsperson had higher Q angle in comparison to males making them more susceptible to disorders of patellofemoral joint. Hence, Encouragement and awareness is needed to not only carry out periodic screening of susceptible population but also its usage in clinical practice and prognosis of affected individual after treatment.

Keyword: Knee joint, Q angle, Goniometer, Sedentary, Sportsperson.

Morphometry of Articular Surfaces of Upper End of Ulna on the Basis of Digital Image Analysis & Fractal Geometry in North-West Indian Population

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ABSTRACT

Background: The commonest site for fracture in ulna is its upper end including its olecranon process and coronoid process. Imperfect replacement of a dislocated or fractured bone result in complication like instability, stiffness of joint and functional deformity. The aim of this study is to determine the morphometry of the upper end of ulna and its articular surfaces by fractal geometry and digital image analysis. **Methods:** This study was conducted on 91 (Right-49, Left-42) dry ossified ulna bone in which Length of ulna (L)-Digital Vernier caliper, Weight of ulna (W)-Electronic weight balance, volume of upper end of ulna (V)-Alginate cast material, surface area of the sigmoid notches (SA)-Digimizer image analysis software, was measured. Longitudinal dimensional parameters were also studied including; the straight distance between the highest point (tip) of the olecranon and that of the coronoid process (OCD) and the mid-olecranon thickness in medio-lateral (T1) and anteroposterior orientation (T2) which was measured using Digital Vernier caliper. The comparison of parameters between upper end of right and left ulna was done by paired t-test. The p-value < 0.05 was considered statistically significant. SPSS version 23 was used for analysis of data. **Results:** There was statistically significant variation ($p < 0.05$) in relation to the T1, length, weight, Volume, SA2, SA3, SA4, SA5 between right and left ulna. There were no statistically significant variations in relation to OCD, T2 and SA1 between right and left ulna. The average value of T1, T2, length, weight, volume, SA1, SA2, SA3, SA4, and SA5 in right ulna was higher than that of left ulna whereas OCD of left ulna was higher than that of its counterpart. **Conclusion:** The findings of this study will be useful for the engineers and medical professionals for designing the implants which will be used in conditions like fracture and dislocation.

Keywords: Morphometry, Articular surface, Ulna, Digimizer image analysis software, Digital Vernier caliper

Morphometric and Morphological Study of Scaphoid Bone

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ABSTRACT

Background: The scaphoid is one of the most significant carpal bones that take part in wrist joint and is located in the proximal row

of carpal bone. Scaphoid fractures are the most common. The median nerve may be injured as a result of the scaphoid fracture, resulting in carpal tunnel syndrome. **Methods:** The morphological and morphometric differences of 22 dry adult human scaphoid bones were studied. With a vernier calliper, morphometric parameters such as length, width (proximal, waist, distal), length and width of sulci, primary and secondary tubercle height were measured. The circumferences of waist and tubercle were measured by placing a thread around them and measuring its length. **Results:** Thirteen of the 22 bones studied were right, whereas nine were left. The tubercles of scaphoids were mostly pyramidal, but few were conical in shape. The majority of the bones had main dorsal sulci, while others had two and Y-shaped dorsal sulci. The mean length of scaphoid bone of left side was 24.62 mm (SD 2.142) and right side was 25.33 mm (SD 2.000). The Mean width of proximal, distal and base of the scaphoids of left side were 14.54 mm (SD 2.066), 14.15 mm (SD 2.340), 10.08 mm (SD 1.656) and the mean width of right side were 14.00 mm (SD 1.732), 14.33 mm (SD 1.581), 10.22 mm (SD 1.394). **Conclusions:** The information gained from this study will benefit hand surgeons and radiologists. The data obtained from this study will also benefit morphologists and clinical anatomists.

Key words: Scaphoid, Morphometry, Morphology, Tubercle, Waist

A Study of Morphometric Analysis of the Distal End of Ulna

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ABSTRACT

Background: The distal end of ulna consists of head, styloid process and fovea. The head of ulna has pole and seat. The distal end of ulna is of great anatomical and physiological significance for normal hand functioning. Detailed anatomical knowledge of the distal end of ulna has a significant role in understanding and treating painful conditions of distal radio-ulnar joint and post-injury stability. **Methods:** This observational study was carried out on 60 dried ulna bones in the Department of Anatomy, PGIMS, Rohtak, Haryana. The parameters studied were length of styloid process, maximum height of seat, maximum width of pole, maximum width of fovea. Measurements were taken with the help of vernier calipers of 0.01 mm accuracy. Results analysed by SPSS software version 21.0. **Results:** The mean values of all the parameters were observed higher in left-sided ulna in comparison to right-sided ulna except the height of seat of ulna which was found higher in right-sided ulna. There was statistically significant difference observed in height of seat and maximum width of fovea. **Conclusion:** The knowledge of these parameters of lower end of ulna is valuable for reconstruction of distal radio-ulnar joint with prosthesis. The present morphometric data would considerably improve the results of prosthetic surgeries. **Keywords:** Anatomical, Fovea, Seat, Significant, Ulna

Estimation of Stature Based on Hand Breadth among Students of Uttar Pradesh

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ABSTRACT

Background: Stature is one of the most useful anthropometric parameters which can be used to determine the identity of an individual. Stature and measurements of various body parts have become useful in forensic medicine and medico-legal cases to identify bodies that may have been destroyed in mass disasters like plane crashes, blasts and accidents etc. The aim of this study was to determine anthropometric values for stature and hand breadth in Uttar Pradesh population and to estimate height from hand breadth with the help of a regression equation formula. **Methods:** The present study was conducted on a sample of 400 students of Integral University (200 males and 200 females). Hand breadth (right and left) was measured and height was also recorded. **Results:** In this study a significant and positive correlation was found between stature, right and left-hand breadth in males and females.

Conclusion: In the present study, we concluded that the mean stature of males was higher than females and using regression equation accurate stature can be calculated from hand breadth.

Keywords: Stature, Hand breadth.

Measurement Of Leg Length Discrepancy by Different Anthropometric Approaches in North Indian Population

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ABSTRACT

Background: Leg length discrepancy is a typical condition that involves the inequality of the length of lower extremities. LLD occurs by the mechanical joint loading of the lower limbs and lumbar joints and the abnormal & immoderate mechanical joint loading may cause the musculoskeletal disorder like osteoarthritis. The most common consequences of the LLD are kinematic imbalance, scoliosis, degenerative joint inflammation (arthritis) and may also alter the posture and walking pattern. Present study was conducted to observe baseline values of Leg Length Discrepancy in north Indian population. **Methods:** The study has been done on 200 normal adult subjects. Height, weight, and BMI were measured and calculated. The leg length was measured by three different clinical method using tape in the supine position. We measured the leg length from ASIS to the medial malleolus, ASIS to the lateral malleolus, and Umbilicus to the medial malleolus. We also calculated the predictor index that help to identify subjects more prone for low back pain in future. Association between the parameters was investigated by means of chi square test. The p value less than 0.05 were considered statistically significant. **Results:** Out of 200 subjects, mild and moderate LLD was observed in 78 and 4 subjects respectively while 118 subjects had no LLD. $PI \geq 1.75$ was found in 4 subjects. There was statistically significant ($p < 0.05$) association between LLD and Predictor Index while no association was observed between BMI and LLD. **Conclusion:** Observation of mild to moderate LLD in 41% subjects and statistically significant association between LLD and PI illustrates the significance of measuring LLD. Thus, periodic screening in young individuals for leg length discrepancy is the need of hour which could allow for more effective & preventive strategies for future structural damage to musculoskeletal system.

Key words: Leg length discrepancy, Malleolus, ASIS

Morphometric Study of Scapular Index in South Indian Population

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ABSTRACT

Background: Scapula is a flat, triangular bone forming very important shoulder joint and with the evolution it has undergone modifications especially in its shape. It can be best studied with the help of Scapular index - which denotes the relationship of breadth of the scapula to the length of the scapular bone. To determine the morphometric dimensions and scapular index in South Indian population and to compare it with various ethnic groups. **Methods:** The present retrospective observational study utilised a total of 98 scapulae of both right and left sides from South Indian population available over a period of one year in the Department of Anatomy of tertiary care center. The relationship of scapular length with its breadth was expressed as the scapular index. The obtained values are analyzed using SPSS Software. Mean, ratio, percentage and standard deviations were applied and results were analyzed. **Results:** The breadth of the scapula ranged from 83 to 112 mm and the mean value was 96.71 ± 6.98 mm. The length of scapula ranges from 104.5 to 165 mm and the mean value was 136 ± 13.52 mm as standard deviation respectively. The scapular index was ranging from 55.62 to 87.08 and the mean value was 71.46 ± 5.64 . The infraspinal index, ranged from 68.42 to 121.33 and the mean value was 94.14 ± 10.98 . **Conclusion:** The morphometric data of the present study can be used in comparative anatomy between the

different races, but also between the subpopulations of our country also. The data of the present study can be useful for manufacturing various prosthetic products, for procedures such as prosthetic positioning of scapula and also in various surgical maneuvers like screw fixations, replacements of the shoulder joint in our subset of population for various medical field such as Orthopaedics.

Keywords: Scapular region, Morphology, Infraspinal Index, Shoulder.

A Morphometric Study on Articulating Facets of Talus in North Indian Population

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ABSTRACT

Background: The superior, medial and lateral articular surfaces of body of talus take part in formation of Ankle joint. The knowledge of morphometry of these articular surfaces will aid in designing ankle implants and will be helpful in ankle replacements. **Methods:** The present study was done on 60 dry adult human tali (24 left and 26 right) obtained from Department of Anatomy, SGT Medical College, Budhera. The measurements on the articular facets on the superior, medial and lateral surfaces of body of talus were taken with Digital vernier caliper and the results were compared with the previous studies. **Results:** Mean values of Medial, Central and Lateral length on Trochlear surface were: 30.18 ± 3.37 mm, 29.97 ± 2.11 mm and 29.60 ± 1.91 mm on left side and 29.87 ± 2.93 mm, 29.87 ± 3.14 mm and 29.32 ± 2.98 mm on right side. Mean values of Anterior, Central and Posterior width on Trochlear surface were: 28.16 ± 2.76 mm, 26.77 ± 1.94 mm and 22.98 ± 2.46 mm on left side and 27.01 ± 2.79 mm, 26.2 ± 2.76 mm and 22.92 ± 2.33 mm on right side. For Lateral articular surface, average central height and width was 24.08 ± 1.99 mm and 25.05 ± 4.3 mm on left side and 23.25 ± 3.72 mm and 24.84 ± 4.08 mm on right side. For Medial articular surface, mean Central height and width was 12.08 ± 1.58 mm and 26.43 ± 2.75 mm on left side and 12.81 ± 3.66 mm and 27.21 ± 2.56 mm on right side. **Conclusions:** The values of parameters of present study differ from other studies due to environmental and genetic variations. These measurements help orthopedic surgeons in foot reconstruction and talus implants.

Keywords: Talus, Trochlear surface, Triangular facet, Comma shaped facet

The Morphometrical Study of Pinna (Ear) Nepalese Population

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ABSTRACT

Background: The ear (external Pinna) is an important and under-recognized defining feature of the face whose shape and size conveys information about age and sex. People having abnormal set of ears through congenital malformations or loss of the auricle through trauma usually feels depressed and uncomfortable. Preauricular appendage and pits are skin tags depression found on anterior to ear and associated with malformation. Any auricular defect in form of inappropriate size, abnormal elongation of the auricular lobe, or missing part is corrected by surgery. To determine the normal anthropometric measurement of external ear in male and female Nepalese population. **Methods:** This study was conducted on 400 Nepalese populations. Out of sample 400, 200 were male and 200. All parameters were measured by using digital vernier caliper. **Results:** The result of our study found that right ear length were found 59.33 ± 4.2 and 57.53 ± 4.23 in male and female respectively with significance 0.001. Right ear with 31.22 ± 3.35 and 29.16 ± 2.9 with 0.001 significance among male and female respectively. Right lobule length 17.93 ± 3.4 and 19.79 ± 6.72 with 0.001 significance among male and female respectively and right lobule width 20.03 ± 2.63 and 18.84 ± 3.28 with significance 0.001 among male and female respectively. Similarly Left ear lengths were found 59.33 ± 3.98 and 56.59 ± 7.02 in male and female respectively with

significance 0.001. Left ear with 30.83 ± 3 and 29.92 ± 3.95 with 0.001 significance among male and female respectively. Left lobule length 17.54 ± 2.9 and 20.65 ± 10.78 with 0.001 significance among male and female respectively and left lobule width 20.05 ± 2.94 and 19 ± 3.36 with significance 0.01 among male and female respectively. The most common type of lobule shape were quadrangular with 43.8% and least type of lobule were round with 20.3% Nepalese population. **Conclusion:** These measurements are assets to be helpful for forensic expert in individual identity, for cosmetic surgeries, correction of congenital anomalies of auricle, for designing hearing aids and prepare prosthesis.

Key words: Anthropometric, Ear, Malformation, Congenital etc.

Study on Correlation of Facial Parameters with Stature in Indian Population

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ABSTRACT

Background: Establishment of the identity of an individual plays an important role in identifying the deceased in forensic examinations. Among the primary parameters of identification like race, sex, age and stature, determination of stature is one of the foremost criteria in establishing the identity of an individual. Human face is a biological masterpiece of form and functions. Facial features differ among different races and ethnic groups. Correlation between facial parameters and stature can be useful in forensic anthropology; identifying nasofacial dysmorphology, maxillofacial and facial reconstruction surgeries. To correlate various facial parameters with stature & to derive regression equations to estimate stature from facial height and facial width. **Methods:** The study was done on 500 individuals of age between 18-25 years. Stature, facial height and facial width were measured by using a standard spreading caliper and facial index calculated. The data were subjected for statistical analysis by using regression analysis & correlation coefficient. **Results:** The results showed that there was a statistical significant difference in facial indices between male & female students with mean of 116.1 & 120.9 respectively. There was statistically significant correlation between stature with facial height ($r = 0.098$) & facial breadth ($r = 0.160$). Linear regression equation for estimation of stature from facial height and facial width were derived. **Conclusion:** This study can be beneficial in forensic applications, clinical diagnosis & facial reconstruction surgeries

Keywords: Stature, facial height, facial width, facial index, Forensic anthropology

A Craniometric Study among Indian Students

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ABSTRACT

Background: Physical Anthropometry is one of the tools to evaluate and measure the human body dimensions. Craniometry is an important branch of anthropometry through which cranial dimensions can be measured. Cephalic index (CI) is very useful anthropologically to find out racial and sexual differences. It is also known as a cranial index or Index of 2 breadth. Cephalic index is the ratio of the maximum breadth of the head to the maximum length of the head. On the basis of the cephalic index, head shapes are grouped into dolichocephalic, brachycephalic, mesocephalic, and hyperbrachycephalic. It is one of the important parameters for identification and also to differentiate between different human races. **Methods:** A cross-sectional study was conducted among students in Sri Siddhartha Medical College, Tumkur. A total of 501 subjects (236 males and 265 females) cranial parameters were recorded. Cephalic indices of all the subjects were analyzed based on Martin & Saller method. The Head Length (Greatest anteroposterior diameter) was measured with the help of spreading calliper, from Glabella to Inion. The Head-breadth was measured as the maximum transverse diameter between two fixed points. All the measurements were taken with the subject sitting in chair, in relaxed

condition and head in anatomical position. **Results:** Dolichocephalic head type was predominant in both males (55.5%) and females (52.1%). The comparison was statistically significant. Head length measurements revealed medium classification (49.6% in males and 40% in females). Head breadth measurements were predominantly very narrow: 49.6% in males and 40.8% in females. **Conclusion:** This study might serve as the basis of comparison for future studies on the cephalic index using Martin & Saller classification. It carries significance in fields of forensic medicine, anthropology and in genetics.

Keywords: Cephalic index; Head length; Head breadth; Anthropometry

Explicit vs. Virtual

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ABSTRACT

Background: "Obey the laws, and wear the gauze, protect your jaws, from septic paws." In 1918, when the world was struck by the Influenza pandemic, this popular jingle made its way through millions of houses and subtly advertised the dire need of preventive measures in a pandemic that affected the world at such large scale. This past year, we have already learnt how dangerous impatience can be from the state of our country's healthcare and the crisis, after we blatantly ignored the possibility of the second wave of the pandemic. **Methods:** This survey was conducted amongst undergraduate college students with the aim of establishing a consensus regarding the prevalent preference between virtual education and explicit teaching. The survey was conducted using Google Forms and was circulated amongst 50 undergraduate students of different colleges across the country. The survey consisted of 10 questions that were structured to establish the preference between online virtual teaching and offline explicit during this time of the pandemic. **Results:** The results of the survey were as follows: (a) Out of 50 students, 88% agreed that at this time, virtual classes are the safer and better approach for education as well as safety. (b) When asked about their willingness to give university exams on the campus, 78% of the students agreed that exams should be held using virtual platforms while 11% remained neutral on the matter. (c) On the question about being vaccinated yet or not, 82% students revealed that they aren't vaccinated yet on account of vaccine shortage in India, while 5% have been vaccinated once and the rest revealed disapproval to getting vaccinated at all. (d) About 46 students out of the 50 agreed that universities should open at full capacity after most of the faculty and students get vaccinated. **Conclusion:** On the basis of the survey, it can be concluded that the general consensus regarding the method of education is that at this time students prefer virtual teaching on the account of their safety. It can also be established that explicit teaching is dangerous and can result in uncontrolled spread of the virus very easily. Thus, at this time to ensure the safety of the students and faculties, virtual teaching is the better and safer way of teaching

Keywords: Gauze, pandemic, influenza, paws, consensus

A Comparative study on the Morphology, Morphometry and the Histological features of the Aortic valves of Human with Pig, Calf & Sheep Aortic valves

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ABSTRACT

Background: The Aortic valve is one of the four valves of the heart controlling the blood flow. It is present at the outflowing part of the left ventricle. The availability of the Aortic valve for the transplantation is very less and thus this has increased the interest to study on easily available sources for the suitable and durable valve xenografts. Present study was carried out to compare the morphological, morphometric and histological characteristics of Human Aortic valves with the Pig, Calf & Sheep Aortic valves so that it may be useful in diagnostic & surgical treatment and selection of most favourable heterograft donor species. **Methods:** 5 Healthy

Human hearts of unknown sex and age were obtained by the department of Anatomy of Bowring and Lady Curzon Medical College & Research Institute, Bangalore and 5 Hearts of pig, calf & sheep each were collected from a nearby abattoir and fixed in 10% formaldehyde solution. The aorta with the intact valves was dissected and studied for the circumference of the valve, number and height of the cusps. The thickness and the components of the valves were studied under the light microscope. The values were statistically compared and analysed for the results. **Results:** All the hearts assessed were having 3 aortic cusps. In relation to the height and size of the cusps, the left coronary cusp was larger in Humans and also in the pig, sheep and calf. The mean diameter of the annulus in human is 26.4mm. The mean diameter of the annulus in pig is 26.6mm, calf is 33.7 and sheep is 25.8mm. **Conclusion:** The calf non coronary leaflet base is continuous with the cartilaginous structure which may gradually ossify. Sheep leaflets are very thin. Human and pig leaflets were almost of the same size and same thickness and is completely made of fibrous tissue. The features studied in this would suggest that the pig valves are most optimal for the heterografts compared to calf and sheep.

Keywords: Aortic valves, Cusps, Xenograft, Transplantation, Morphology, Morphometry.

A Comparative study on the Morphology, Morphometry and the Histological features of the Chordae Tendineae of the Tricuspid Valve of Human with Pig, Calf & Sheep

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ABSTRACT

Background: Valvular heart disease is the most common cause of congestive cardiac failure & the disease is progressive & irreversible. Dysfunction of the papillary muscles and their chordae tendineae leads to the incompetence of the valvular apparatus. Clear knowledge of morphology & histology of valves is very important for surgical and diagnostic purpose. The present study was carried out to compare the morphological, morphometric and histological characteristics of Human Tricuspid Valve with Pig, Calf & Sheep so that it can be useful in affordable and durable xeno transplant. **Methods:** 5 Healthy Human hearts of unknown sex and age were obtained by the Department of Anatomy of Bowring & Lady Curzon Medical College & Research Institute, Bangalore and 5 hearts of pig, calf & sheep each were collected from the nearby abattoir and fixed in 10% formaldehyde solution. The hearts with intact tricuspid valves were dissected and their morphometry was studied. Number of the papillary muscles with their position was noted. The values were statistically compared and analysed for the results. For histological comparison, cross section of junction of papillary muscle and chordae tendineae were studied under light microscope. **Results:** The number and position of papillary muscles were similar in all the species but the number of bellies of each papillary muscle varied. The length & thickness of papillary muscles were found to be highest in cow and least in pig. Number and length of Chordae Tendineae as well as the histological features were almost similar in Human and Pig heart. **Conclusion:** We observed that the heart differed in each species which could relate to the embryological development. Although the difference exists, the morphological and histological studies reveal similarity between pigs and human's tricuspid valve and chordae tendineae which increases the scope of study for xenotransplantation. The features studied in this would suggest that the pig valves are optimal for the heterografts than the calf's and sheep's.

Keywords: Tricuspid valves, Xenotransplant, Chordae Tendineae, Papillary Muscles, Morphology, Morphometry, and Histology.

Diverse Anatomical Configuration of Posterior Intercostal Veins in Relation to Thoracic Sympathetic Chain: A Case Series

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ABSTRACT

Background: The clinical conundrum of vascular injuries during thoracic interventions may be attributed to the diverse anatomy of the intercostal veins and the sympathetic trunk, which continues to remain an unrecognized area of clinical application. The purpose of this case series is to describe different presentation features of posterior ICV in relation to the thoracic sympathetic chain in cadavers to highlight potential sites of injury during surgeries and to explore its possible therapeutic relevance. To our knowledge, only few reports of ICV variants exist, with no mention of anomalous ICV branching or cadaveric studies. **Methods:** Study design: Case Series • The thoracic sympathetic chain and posterior ICV were dissected bilaterally in 3 formalin-preserved cadavers • The posterior ICV, thoracic sympathetic chain, azygous and hemiazygous veins were painted for easy identification. **Results:** Anterior crossing of veins in relation to sympathetic chain was observed in all 3 cadavers, with two on the right and one in the left hemithorax. Case 1: 2nd and 3rd posterior ICV form common trunk which crosses sympathetic chain in right second ICS. Case 2: 4th and 5th ICV form common trunk before draining into azygous vein, with 5th ICV crossing sympathetic chain in right fifth ICS. Case 3: 3rd and 4th veins form a common trunk which de-branches into the same veins, with 3rd ICV crossing sympathetic chain in left third ICS. **Conclusion:** Considering the high risk of significant bleeding, surgeons must be cognizant of potential variations in the configuration of veins in second and third ICS when performing cardiovascular, neurological and orthopedic interventions to prevent complications like hemothorax. Such anatomical diversities might help optimize novel approaches to interventions like central venous access by serving as alternate sites of entry, among other clinical applications.

Keywords: Intercostal vein; Sympathetic chain; Hemothorax; Anatomical variation