

From Sushrut to Campbell Orthopaedics then and Today

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Abstract

Healing is a matter of time. But it is sometime also a matter of opportunity. (Hippocrates)

The ancient Indian Medical Science can be traced back to vedic period. The Vedas are considered to be the first record of the ancient knowledge and civilization in the world. The “Sushrut Samhita” is a sanskrit text that covers areas of both surgery and medicine. This compendium is also considered to be one of the main foundation of Ayurveda.

Ayurveda later developed as a separate system of medical knowledge and has been given the status of “Upveda”. The fifth veda in the next stage of its growth. The maximum description of medical science is included in the “Atharveda”. The penultimate source of Ayurveda.

“Sushrut Samhita” is said to be the most comprehensive text written on surgical practice. Modern surgery is also said to be developed from the basics provided by Sushrut. The fact that sushrut made the beginning of every aspect of surgery. documented the techniques covering all minute details of “Shalya Tantra” in an era which lacked scientific advancement and technical help with almost no facilities available, makes us bow down our head with respect and reverence to this great saint, teacher of Ayurved and doctor.

Keywords: Sushrut, Sushrut Samhita, Shalya Tantra, Dislocation and Fracture.

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Introduction

“त्रिकालावाधितो नित्यं यद् भावि यच्च तिष्ठति,१
तज्ज्ञानमनिष्ठाषित्वं ऋषिर्भित्तव दर्सिभः।।”

तत्वदर्शी ऋषियो ने कहा है कि ज्ञान तीनो कालो में नष्ट नहीं होता है। जो तत्व आज है वह पूर्व में था और आगे भी रहेगा। वह ज्ञान अविनाशी है।१२२

The Sushrut Samhita (Literally means Sushrut Compendium) is an ancient sanskrit text on medicine and surgery and is one of the most important such treaties on the subject to survive from ancient world.^[1,2] The compendium of Sushrut is one of the foundation text of Ayurveda (Indian traditional medicine) along with the Charak Samhita.

The Sushrut Samhita is of great importance because it includes historically unique chapters describing surgical training, instruments & procedures.^[3,4]

Rao in 1985 suggested that the original layer to the Sushrut Samhita was composed in first millennium BCE by elder Sushrut consisting of 5 books 120 chapters, which was redacted & expanded with “Uttar Tantra”, as the last layer of text in first millennium CE bringing the text size to 6 books & 184 chapters.^[5]

Walton et. All. In 1994 traced the origin of text to the first Millennium BCE.^[6]

Tipton et. All. in 2008 historic perspective review states that uncertainty remains on dating the text, how many authors contributed to it and when.

Estimates range from 1000 BCE, 800-600 BCE, 1-100 CE and 500 CE.^[7] Partial resolution of these uncertainties, states Tipton has come from comparison of Sushrut Samhita Text with several Vedic Hymes particularly the Atharaveda such the hyme on creation of man in its 10th book.^[8]

The chapter of Atrey Samhita describe the human Skeleton.9 Better dating of ancient text that mention name of Sushrut, and critical studies on ancient Bower manuscript by Hoernle.^[10] These information traced the first Sushrut Samhita likely to be composed in first millennium BCE.^[11]

Knowledge is like building blocks & the way it stands today is on foundation of such old efforts. We will try to find out what was said about Orthopaedics practices by such old but enlightend minds and what is said today about such practices in modern Orthopaedics. So the quest of knowledge continues from Sushrut & Charak to Cambell.

“There are in fact two things, science & opinion; the former begets knowledge & the later ignorance”
(Hippocrates)

Subjects and Methods

“यथा खरचन्दन भारवाही भारस्तवेत्ता न तु चन्दनस्थ ।
एवं ही पास्त्राणी बहून्यधीत्य चार्थेषु भुवः खरवाद्दन्ति ।।३

जिस प्रकार गधा केवल चन्दन का बोझ उठाने वाला होता है। वह चन्दन की सुगन्ध को नहीं जानता इसी प्रकार जो शिष्य बहुत से पास्त्रों को केवल पढ़ लेते हैं, अर्थ को नहीं समझते वह केवल बोझ को उठाने वाले ही होते हैं।

(सुश्रुत संहिता)

Sushrut (Devnagri, lqJqr an adjective meaning “renowned”) is the name in the text of the author who presented the teaching of his Guru Devdasa.^[12] He said in ancient text such as the Buddhist Jatak to have been a physician who taught in a school of Kashi (Varanasi) in parallel another medical school in Taxshila (on Jhelum River) sometime between 1200 BC to 600 BC.^[13-16] One of the earlier known mentions of the name Sushrut is in the Bower manuscript (4th or 5th century) where Sushrut is listed as one of the 10 sages residing in Himalayas.^[17]

Rao in 1985 suggested that the author of the Original “layer” was elder Sushrut (Vridha Sushrut) the text, states Rao, was reduced centuries later by “another Sushrut” then by Nagarjun & there after “Uttar Tantra” was added to it.^[5] It is generally accepted by Scholars that there were several ancient authors called Sushrut who contributed to this text.^[18]

Ancient qualification of a Nurse-

“That person alone is fit to nurse or to attend the bedside of a patient who is cool head and pleasant in his demeanor, does not speak ill of anybody, strong & attentive to the requirements of sick and strictly & indefatigably follows the instruction of the physician”

(Sushrut Samhita Book 1, Chapter 34, Translator: Bhishagratna)

Do we not still search these requirements in our paramedical staff which was described in our literature centuries back? Our knowledge of the contents of the Sushrut Samhita is based on additions of the text that were published during nineteenth & the early twentieth century. Sushrut Samhita in its exact form is divided into 186 Chapters & contains description of 1120 illness, 700 Medicinal plants, 64 preparation from mineral sources & 57 preparations based on animal sources.^[19]

Sushrut, states Tipton, asserts that a physician should invest efforts to prevent disease as much as curative remedial procedures.^[20] The text says an important means for prevention of disease is physical exercise & hygienic procedures.^[20] Sushrut also says that excessive strenuous exercises can be injurious & make one more susceptible to disease, cautioning against such excesses.^[10] Regular moderate exercise, suggest Sushrut, improves resistance to disease and physical decay.^[20]

“सुख संज्ञक आरोग्यं विकारो दुःखमेव चः” (सुश्रुत संहिता)

संसार में भत्ते, पैसा, मकान, नौकर, आदि को सुख एवं दरिद्रता, षोक, चिन्ता का दुःख कहे पर आर्युवेद में तो आरोग्य को सुख एवं रोग को ही दुःख कहा है।

The text has been called a Hindu text by many Scholars.^[21-23]

The text discusses surgery with the same terminology found in more ancient Hindu Text.^[24,25] mentioned Hindu Gods such as Brahma, Rudra, Indra & others in its chapters.^[26,27] refers to the scripture of Hinduism namely the Vedas.^[28,29]

The Sushrut Samhita & Charak Samhita have religious ideas throughout, states Estiven Engler who then concludes “Vedic element are too central to be discounted as marginal”.^[30]

These ideas include treating cows as sacred, extensive use of terms & some metaphors that are pervasive in the Hindu Scriptures- the Vedas & inclusion of Karma, self (Atma) & Brahma (Metaphysical reality) along the line of those found in ancient Hindu text. However, adds Engler, the text also includes another layer of ideas where empirical rational ideas flourish in competition or cooperation with religious ideas.

Sushrut is reverentially held in Hindu tradition to be a decedent of Dhanvantri, the mythical god of Medicine.^[31] or as one who received the knowledge from a discourse from Dhanvantri in Varanasi.^[12]

“तत्र साध्या अपि व्याहस्यः प्रायेषैणा दुष्चिकित्स्यतमा भवन्ति
तथया श्रोत्रिप तृपति स्त्री बाल भीरु राजसेवक कितव
दुर्बल वैद्य विदम्ब व्याधि गोपक दरिद्रम कपण क्रोध नाना-
मनात्भवतामनाथानं च एवं निरुपमं चिकित्सा कुर्वन्
धर्मार्थकामयषसि प्राप्नोति ।”

(सुश्रुत संहिता)

निम्न व्यक्तियों में साध्यरोग भी प्रायः (सर्वत्र नदी) अतिकाष्ट साध्य होते हैं। यथा श्रोत्रिप (नित्य वेदाध्यायी) स्नान पाठ करने की वजह से, राजा (स्वतंत्र प्रवृत्ति से), स्त्री सुकुमा, रता लज्जावष, बालक, वृद्ध, भीरु (कोमल डरपोक होने से), राजसेवक (राजा के अधीन होने से) कितव (जुआरी – कोमल प्रवृत्ति) दुर्बल, वैद्य का तिरस्कार करने वाला, व्याधि को छुपाने वाला, दरिद्र कपटि, क्रोधी, अपत्यम सेवी, अनाथ अजितेन्द्रिय इन पुरुषों का साध्य रोग भी कष्ट साध्य होता है।

All of us having some experience in treating such class of patients have found that it is quite difficult to produce good results in these patients inspite of them be cured of illness.

We will now do comparative analysis of what is said about dislocations and fractures in Sushrut Samhita & what we follow today.

A joint is dislocated when its articular surfaces are completely displaced, one from the other so that all contact is lost.



“अथातो भनानां निदानं व्याख्यास्थाम
यथोवाच भगवान् धन्वन्तरि ।
पतनपीडम प्रहाराक्षेपण व्यालमृग दषण
विषेपरनेक विद्यभस्थला”

(सुश्रुत संहिता)

भगवान् धन्वन्तरि भग्ननिदान की व्याख्या करते हुए कहते हैं कि गिरने से, दबाने से, चोट लगने से, आक्षेपण (झटकने से), सिंह मृग के दातों का नख से एवं बलवान से लड़ाई में (कुप्ती) चोट विषेप लगने के कारण बहुत प्रकार से अस्थि भंग होता है ।

तंत्र मद्धः जातमलेख विद्यमनु सभिमाणं द्विविधं वोयय में वोययते संधिमुक्तं, काण्डभग्नं च । तत्र पड्विधं संधिमुक्तं द्वादषविधं काण्डभग्नं भवति ।

सम्पूर्ण प्रकार के भग्नो का तत्रत् रूप में अनुसंधान करने से दो प्रकार के भग्नो में ही अन्तर्भाव हो जाता संधिमुक्त ;कपेसवंबंजपवदद्ध एवं काण्डभग्न ;तिबजनतमद्ध

“तत्र संधिमुक्तं- उत्पिष्टं, विश्रिष्टं, विवन्तिम्
अविक्षिप्तं तिर्यकक्षिप्तमिति षड्विद्यम्”

इनमें संधिमुक्त भग्न 6 प्रकार का है ।

1. उत्पिष्टं (चूर्णित)
2. विप्लिष्टं (पृथक हुआ)
3. विवन्तिम् (वार्म पार्श्व में घुमा हुआ)
4. अविक्षिप्त (ऊपर या नीचे)
5. अतिक्षिप्त (इसमें मॉस का विदारण भी हो सकता है)
6. त्रिर्यकक्षिप्त (टेढा होकर थोडा से हिला हुआ)

(सुश्रुत संहिता)

Today we classified dislocation on their etiology where it can be because of

1. Traumatic dislocation because of trauma
2. Pathological dislocation because of disease

Hip dislocation is either anterior or posterior (Avikshipta). Dislocation cannot occur without damage to the protective ligament or joint capsule (Atishipt). Usually the Capsule & one or more of the reinforcing ligament are torn permitting the articular end of the bone to escape through the rent. Subluxation is when a joint, its articular surfaces are only partially displaced & retain some contact between them. (Triyakshipt). If we see about dislocation of shoulder joint then all the six classes described by Sushrut can be seen.

Fracture dislocation upper end of humerus four parts is basically (चूर्णित) as description says dislocation of head with fracture of neck humerus greater & lesser tuberosity in hindi meaning “चूरा हो गया ” it was very astutely described by Sushrut & we get all conditions in displacement of Shoulder joint the head separated from glenoid cavity of Scapula (Vishlistam)."

“पृथक हुआ” dislocated into chest wall (विवन्तिम्) “वार्म पार्श्व में घुमा हुआ”

Thus the list described by Sushrut are covering joint dislocation as whole & its specific condition making it very comprehensive & encompassing all joints of body along with soft tissue disruption and fracture of bone along with it

“तत्र प्रसारण कृत्रज्ञनविवर्तना षवितरु ग्ररुजात्वं
स्पर्थासहत्वं चेति सामान्यं सन्धिमुक्त लक्षण मुक्तं।”

लक्षण- प्रसार में (फैलाने में), आकुंचन (सिकोडना) विवर्तन (विपरीत घुमाने में), आक्षेपण (जोर से चलना) में अषवित, तीव्र वेदना स्पर्श की असहिष्णुता ये सन्धिमुक्त (dislocation) के लक्षण है ।

“ वैषेष्कि तूष्किष्टिे संधवमयतः षोफो वेदनाप्रादुर्भाव के,
विषेपतक्ष नाना प्रकार वेदना रात्रो प्रादुर्भावन्ति विल्किष्टेवलय
षोफो वेदना सातत्यं संधितिक्रिया च तिवर्तिते क सन्धि
पाश्र्पगमं नामिषमागडता वेदना च अविक्षिप्ते सन्धि विषेप लक्षण
स्त्रीन्सज्ञत्वं च अतिक्षिप्ते द्वयोः सन्ध्या स्थलोट तिकात्ता
वेदना चः तिर्यकक्षिप्ते त्वेकास्थि पार्श्वगमन मत्यर्थ वेदना चेति”

विषेप लक्षण -

उत्पिष्ट सन्धिमुक्त में -सन्धि के दोनो पार्श्व में वेदना का होना और विषेपतः नाना प्रकार की वेदनाये रात्रि में उत्पन्न होती है ।

विप्लिष्ट सन्धिमुक्त में- थोडी सूजन निरन्तर वेदना, संधि मे अक्रियता (ना चलना) आ जाती है ।

विवर्तित सन्धिमुक्त में - संधि से एक पार्श्व हटकर दूसरे स्थान में जाने से अंग में विषमता एवं वेदना होती है ।

अविक्षिप्त सन्धिमुक्त मे - संधि का पृथक होना एवं तीव्र वेदना होती है ।

अतिक्षिप्त सन्धिमुक्त में -संधि वाली दोनो अस्थियों परस्पर दूर हो जाती है एवं तीव्र वेदना होती है ।

त्रिर्यक सन्धिमुक्त में - एक अस्थि पार्श्व में दूर हट जाती है एवं तीव्र वेदना होती है ।

Dislocation are only real emergency & require immediate closed reduction with intravenous analgesia & sedation or with general anaesthesia. Excessive force should not be used in closed reduction because of soft tissue or bone sometimes becomes interposed between the articular surfaces making closed reduction impossible.

Symptoms & signs for dislocation are

1. Pain - dislocations are very painful
2. Deformity - in most dislocation the limb attains a classic attitude like
 - Shoulder Dislocation – anterior – abduction
 - Elbow dislocation – posterior – flexion
 - Hip - posterior – flexion adduction & internal rotation³²
3. Swelling - it is obvious in dislocation of superficial joint, but may not be seen in a joint located deep.
4. Loss of movement - because of severe pain muscle spasm and loss of articulation
5. Shortening of Limb - occurs in most dislocation except in anterior dislocation of the hip lengthening occurs.
6. Telescopy – in this test it is possible to produce & abnormal to and fro moment in a dislocated joint.

Damage to articular cartilage, joint capsule, ligaments & vascularity of bone is also evaluated. These complications usually are caused by the immense forces that caused dislocation. Sometimes neurovascular structure are injured & should be looked for & entry into patients chart should be made before reduction.

Skeleton system injuries are as old as the evaluation of human beings. The accidental injuries are unavoidable incidents from the day of origin of mankind. Till modern days treating such traumatic conditions of Bone or articular cartilage is known as (BHAGNACHIKITSA) in Sushrut Samhita as there were no diagnostic aid available to them. The concept mention by Sushrut are based on vast clinical experience & observation

“ काण्डभग्न ऊर्ध्व वन्यासः - कर्कटकम, अष्वकर्ण, चूर्णित, पिच्चित्तम, अस्थिच्छलितं, काण्डभग्न मज्जानुगतं, अतिपातितं, कर्क, छिन्न, पाटितं, स्फुटितनिति द्वादषम”
काण्डभग्नं या अस्थि का टूटना 12 प्रकार होता है ।

1. कर्कटक – karkatak – depressed fracture
2. अष्वकर्ण – ashvakarna – complete/fracture
3. चूर्णता – Churnita – comminuted fracture
4. पिच्चिता – pichichita – compressed fracture
5. अस्थिचलिता – asthichalita – periosteum avulsion fracture
6. काण्डभग्न – kandbhagn – complete compound fracture
7. मज्जानुगत- majjanugat - impacted fracture
8. अतिपातिता – atipatita – compound fracture bones out
9. वक्र – vakra – green stick fracture
10. चिन्ना . Chinna – incomplete fracture
11. पातिता – patita – Comminuted fracture
12. स्फुटित – sfutit – fissured fracture

Sushrut also classified all skeletal injuries into two types

1. Swarna Bhagna - Open or Compound fracture
2. Avarna Bhagna - Closed or Simple fracture

The fact is understood by seeing the above classification that Sushrut with his clinical experience without the help of radiograph was able to described all types of fracture & even after more than 2000 years these hold good & there is no change in it.^[33]

“ष्वयथुनावुल्यं स्पन्दनविवतेन स्पर्श सहिष्णुत्व भवयीक्षमाने षब्दःश्मस्तागद्धता विविध वेदना प्रार्दुभावः सर्वास्व वस्यायु न षर्मलाम इति समासेन काण्डभग्नं लक्षण मुक्तं”

सामान्य लक्षण सूजन की अधिकता,स्पन्दन और विवर्तन स्पर्श का असहिष्णुता (हाथ न लगा सकना), दबाने या रगड़ने पर षब्दोत्पत्ति (crepitation) , अंग का गिरा रहना, नाना प्रकार की वेदनायें, किसी भी अवस्था में ष्पान्ति का लाभ न होना ।

“विषेषस्तु संभूतभूयतोऽ स्थिमध्ये भग्नं ग्रन्थि रिवोन्नतं कर्कटं अष्वकर्णं वद्ध दगतं ष्वकर्णकं स्पथ्यमानं षब्दवच्चूर्णितं भवगच्छेत पिच्चियतं पृथकतागतं भ्यषोकं, पार्श्वयारस्थि दीनोदगतं अस्थवदोग्दं सिमामध्यमनु प्रविष्म ।।३”

३ मज्जानुमन्हयतिति मज्जानुगतम असिी निःषेषतछनमनिमाति आगुम्न तिभुक्ता अस्थि वक्रम अन्य तरपा ष्वानिषिष्टं छिन्नं परितमणुबहुतिदारितं वेदनावाध्य षूकपूर्णभिवाध्यात् विद्वलं विस्फुटितम स्फुटितमिति ।।३”

काण्डभग्न (Fracture) के विषेष लक्षण –

1. कर्कटक - अस्थि मध्य में से टूट जाने पर ऊर्ध्व और अधः (fragment) दोनो प्रान्तो में कार्य में अषक्त बन जाती ह। और केकडे के सामान ऊपर उठी रहती
2. अष्वकर्ण में - घोडे के कान के सामान उपर उठी रहती है ।
3. चूर्णित भग्न में - अस्थि स्पर्श करने से चर पर षब्द करती है।
4. पिच्चितभग्न में – अस्थि फैल जाती है एवं सूजन थोडी होती है।
5. अस्थिचलिता में – अस्थि पार्श्व में कुछ ऊपर उठ जाती है एवं अस्थि का छन्ना सा बन जाता है।
6. काण्डभग्न में - अस्थि पकड़ कर हिलाई जा सकती है या हिलते हुए देखी जा सकती है।
7. मज्जानुगत में - अस्थि का कोई भाग अस्थि के अंदर घुस कर मज्जा को बाहर कर देता है ।
8. अतिपातिता में - अस्थि सम्पूर्ण रूप से छिन्न भिन्न हो जाती है ।
9. वक्रभग्न में - अस्थि मुड़ जाती है परन्तु अलग नही होती है।
10. छिन्न भग्न में - एक पार्थ में लगी रहती है एवं एक पार्श्व में छिन्न हो जाती है ।

11. पातिता में - फटने से बहुत छोटे छोटे टुकडे हो जाते है
12. स्फुटित षूक में - पूर्ण के समान वेदना युक्त, सूजी हुई विषेष रूप से विदलित – कणों में टूटी हुई अस्थि स्फुटित होती है ।

To summarize in the case of fracture the clinical features will be –

1. Marked swelling
2. Tenderness
3. Crepitations
4. Loss of limb function
5. Different type of pain
6. Inability to find comfort in any position

This indicates the perfection that Sushrut achieved in those days without ultra-modern amenities. One more point to note here is in his clinical features Sushrut has mentioned different types of pains where it indicates that Sushrut has gone further deep into the subject. He was aware that after trauma there will be vitiation of three humor of the body & probably he want to explain a different body constituent person will exhibit different type of pain.

“तेषु चूर्णितछिन्नतिपातिता मज्जानुगति कृच्छुसाध्यानि कृष्वुद्धनालमं क्षतक्षीण कुष्टिष्वासिनां सन्ध्युदगतं चेति ।।”
इसमें –स्फुटित, चूर्णित, छिन्ना, अतिपातिता, मज्जानुगत कष्ट साध्य है। कृष, बुद्ध और बालक में तथा उरः क्षत रोग, क्षीण, कुष्ट एवं ष्वास रोगी में सन्धिभग्न कष्ट साध्य है।

“भिन्न कपालं कण्ड्या तु सधिमुक्तम तथा च्युतम जघनं प्रतिपिष्टं च वर्जयेन्त चिकित्सकः ।।”
कपाल (खोपड़ी) अस्थियों के भग्न हो जाने पर कटिसंधि के मुक्त अथवा च्युत होने पर, जघनस्थान में उत्पिष्ट भग्न होने पर असाध्य समझना चाहियें।

Not only Sushrut describe in details the description of fracture but also warn that at certain places & in certain situations prognosis of disease will be bad. He said fracture of skull involving brain or a vertebral fracture involving spinal cord are difficult to treat.

Again old, child & previously diseased person will have difficult time in getting healed.

“Declare the past diagnosed the present & fortell the future” (Hippocrates)

Discussion

First known surgery performed on human body was mentioned in Rigveda (Composed around 23720 BC) where a prosthetic leg was attached to a queen's leg so that she could walk normal & even participate in war. In spite of the absence of anaesthesia complex operations were performed. The practice of surgery has been recorded in India around 800 BC. This need not come as surprise because Surgery (Shashtra Karma- Hindi) is one of the eight branches of Ayurved the ancient Indian system of Medicine. Sushrut in Sushrut samhita describe in detail anatomy with the aid of dead body. Sushrut has described surgery under eight heads.

1. Chedyā छेद्य – (excision)
2. Lekhya लेख्य - (scraping)
3. Vedhya वेद्य – (puncturing)

4. Esya ऐष्य - (exploration)
5. Ahrya अहार्य - (extraction)
6. Sravana श्रवना - (Evacuation)
7. Sivya सीव्य - (suturing)
8. Bhedya भेद्य - (Incision)

Sushrut has pointed out that the hemorrhage can be arrested by apposition of the cut edges with stiches, application of styptic decoctions, by cauterisation with chemicals or heat. The progress of surgery & its developments is closely associated with the great wars of the past is well known.

The verana or injury says Sushrut, involves breakdown of body component & may have one or more following seats of occurrence, viz. Skin, flesh, sinews, bones, joints, internal organs of chest & abdomen & vital structures. It is in Sushrut words, the sixth stage of countinous process which starts with Sotha (inflammation), Sushrut says in the first stage the ulcer is unclean & hence called a Dusta – Varana. By proper management it becomes a clean wound a Suddha Varna. There is an attempt at healing and is called Ruhyamana Varna & when the Ulcer is completely healed it is a Ruddha Varna.

Sushrut has advocated use of wine with incense of Canaabis for anaesthesia. The eight types of surgical procedures-

1. Excision (छेदना) – is a procedure where by a part or whole of the limb is cut of from the patient.
2. Incision (भेदना) – is made to achieve effective drainage or exposure of underline structures to take the contents out from the patient.
3. Scraping (लेख्या)- Scraping or scooping is carried out to remove a growth of flash of an ulcer or tartar of teeth.
4. Puncturing (वेदया) – the vein or hydrocele or asatic fluid in the abdominal cavity are drained with a special instrument.
5. Exploration (ऐस्या) – the sinuses & cavities with forgeion bodies are probed or explored for them. Establishing their size, site, number, shape, position etc.
6. Evacuation (श्रवना)- Bloodletting is to be carried out in skin disease, localized swelling abscess etc.
7. Suturing (सेव्या)- in case of accidental injuries & in intentional incision the lips wound are opposed & united by stitching.
8. Incision (भेदया) - intentional cutting to explore underneath structures

To obtain proficiency and accuring skill & speed in this type of surgical manipulations Sushrut has devised various experimental models & modules for trying each procedure. For example, incision & excision are to be practiced on vegetables & leather bags filled with mud of different densities.

Scraping is practiced on hairy skin of animals, puncturing veins of dead animals & lotus stock.

On subject of trauma Sushrut classified bone & their reaction to injuries. Varieties of dislocation of joints (सन्धिमुक्त) & fracture of bones (काण्डभग्न) are given systematically. He classify & gives details of six types of dislocation & twelve varieties of fracture. He gives principles of fracture treatment: - traction, manipulation, opposition, & stabilization. Sushrut has described entire

Orthopaedics surgery including some major of rehabilitation in his work.

As war was major cause of injury the name “षल्यतन्त्र” for this branch of medical learning derived from “षल्य” the arrow of the enemy which in fights use to be loosed in the body of the soldiers. He emphasized that removal of forgein bodies is fraught with certain complications if the seat of the षल्य be a मर्म (Vital Organ).

The definition of an ideal surgeon according to Sushrut is “a person who possesses courage and presence of mind, a hand free from perspiration, tremor less grip of sharp & good instruments & who carries his operation to the success & advantage of his patient who has entrusted his life to surgeon. The surgeon should respect this absolute surrender & treat his patient as his own son”.

Sushrut has given the base of surgery & opened doors to develop the field. The Ayurvedic literature are preserved in the Sanskrit language & originally in form of manuscript written brich bark, palm leaves or paper. This literature should be explored which may further nourish the field of surgery & other branches of Medical sciences.

“Life is short, art long, opportunity fleeting, experience treacherous, judgment difficult”.

Conclusion

After viewing literature we reached on conclusion that what Sushrut has said many many years ago still hold good. A basic stand point that one can postulate after study is that Sushrut’s work is not an elementary work on its chosen topic. The style of writing its cogency as well as compactness, the treatment of subject & the extensiveness of topic covered are all like those of major crafts man and not of an elementary plodder or a stray worker. He has succeeded in surviving till now so long because he succinctly in cooperated much that was found useful & worth commenting upon.^[34]

His work infect is neat soming up, a compilation of great body of tested & settled knowledge on chosen field & rather specialized for an expert & practicing professional circh. It is not a general text by any means that proposes to cover the subject from a basic higher level gradually & logically.

Much like our present day manual and scientific treaties “Sushrut Samhita” contains a glossary “Tantra Yukti” name Adhyaya (Chapter) to explain technical terms used in the book there are thirty two of these Adhikaranas, yoga, Vikalp, Nirnaya...etc. this chapter is one more example of total professionalism exercise by the author.

No Single surgeon in the history of science has to his credit such masterly contribution in the term of basic classification, thoroughness of management of disease & perfect understanding of Ideas to be achieved. So our scientists and their literature was lost in time and they did not get the credit they deserve.

“As to disease make a habit of two things – to help or at least, to do no harm”.

(Hippocrates)

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