

Correlation in Chronic Rhino sinusitis on the basis of Endoscopic and Radiology

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Abstract

Background: There are four pairs of paranasal sinuses. These are frontal, sphenoidal, ethmoidal, and maxillary sinuses. Infection of these sinuses is one of the most common causes of patient's visit to the otorhinolaryngologist. **Method:** Thirty patients each of chronic rhino-sinusitis group were included in this case. Those with recurrence of symptoms of chronic rhinosinusitis after surgical management (revision cases) were included in this study. **Results:** In the present study 30 cases of rhino sinusitis were included. From the 15 patient 60% were male and 40% were female. Symptoms which Commonly present in the patients in this study were nasal obstruction (93.4%) & nasal discharge (53.4%). Sneezing (40%) and headache (33.4%). **Conclusion:** The study conclude that nasal endoscopy was more specific in detecting osteomeatal anatomic variants whereas CT scan is more sensitive for parameters

Keywords: Rhino sinusitis, Endoscopic, Radiology, Paranasal sinuses.

INTRODUCTION

There are four pairs of paranasal sinuses. These are frontal, sphenoidal, ethmoidal, and maxillary sinuses. Infection of these sinuses is one of the most common causes of patient's visit to the otorhinolaryngologist. Out of the five cases, one case presented to the out patient department (OPD) is related to sinuse disease. These chronically infected sinuses are managed through surgical clearance with maintenance of their ventilation and drainage as treatment of choice.^[1] Different diagnostic modalities help in exact diagnosis and safe intervention to achieve this goal. CT and nasal endoscopy are commonly used diagnostic modalities. In recent years, improved radiographic evaluation, methods for intranasal visualization and understanding of etiological factors of chronic rhinosinusitis helped to perform effectively and safely. For the assessment of patients undergoing functional endoscopic sinus surgery (FESS) Computerized Tomography (CT) provides essential preoperative information.^[2] The aim of CT of sinuses is to delineate the extent of the disease. It also defines any anatomical variants and relationship of the sinuses with the surrounding vital structures. Anterior rhinoscopy has limitations in revealing informations about middle meatal cleft, infundibular opening and maxillary sinus. On the other hand endoscopic techniques provides detailed and complete visualization of sinus with minimal distress to the patient. It has been possible to visualize even the areas of the cribriform and orbital wall which are at risk during the surgery and may lead to the complications of cerebrospinal fluid rhinorrhoea and orbital complications. Thus endoscopy and CT have revolutionalized the understanding and management of chronic sinusitis in recent times. Recently combination of diagnostic

endoscopy and CT in the coronal plane has become the basis of the evaluation of the PNS disease. This 2 is the basis of the new concept of FESS. This preoperative evaluation is very much crucial if the patient is of paediatric age 3 group or has undergone a conventional surgery earlier.^[3] The present study has evaluated and compared the endoscopic and CT findings of patients with chronic rhinosinusitis.

METHODS

Study Population:

Thirty patients each of chronic rhino-sinusitis group were included in this case .

Study Area:

This study was carried out in the Departments of Radiology in a tertiary care centre.

Study duration:

Duration of this study was of one year.

Sampling technique & Data collection:

All patients were subjected to a CT-PNS with 3-5 mm coronal and axial cuts using a 16 slice multislice CT-scan machine and findings recorded. Selection of patients for FESS was done on the following criteria: Chronic rhinosinusitis not responding to conservative line of management, Patients with gross polyposis or polypoidal mucosa blocking the osteomeatal unit and any anatomical variant causing blocking the osteomeatal complex and hence responsible for the patient's complaints. Patients underwent FESS (Messerklinger technique and its modifications thereof) either under GA or LA depending on the patient factors like pain threshold and anxiety; personal preference, 5,6 extent of surgery and other systemic factors like hypertension. Post operatively patients were called for follow up on 7 day and then weekly for at least 1 month.^[4,5]

Inclusion Criteria:

Those with recurrence of symptoms of chronic rhinosinusitis after surgical management (revision cases) were also included.

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Exclusion Criteria:

Patients with history of chronic headache without any apparent sinus pathology on conventional radiology wherein non-sinus causes like ophthalmological, neurological, dental or migraine were ruled out. Exclusion criteria included patients with acute rhinosinusitis, sinus neoplasia and those not willing to undergo CT-PNS or FESS.

Data Analysis:

Data were analyzed by using Percentage.

RESULTS

In the present study 30 cases of rhino sinusitis were included. From the 15 patient 60% were male and 40% were female. Symptoms which commonly present in the patients in this study were nasal obstruction (93.4%) & nasal discharge (53.4%). Sneezing (40%) and headache (33.4%).

Table 1: Patients with chronic rhino sinusitis

Condition	Number of patients	Percentage
Patients with chronic rhino sinusitis	30	66.7%
Patients without chronic rhino sinusitis	15	33.3%
Total	45	100%

Table 2: Gender wise distribution

Gender	Number of patients	Percentage
Male	18	60%
Female	12	40%
Total	30	100%

Table 3: commonly presenting symptoms

Symptoms	No. of patients	Percentage
Nasal obstruction	14	93.4%
Nasal Discharge	8	53.4%
Sneezing	6	40%
Headache	5	33.4%

Table 4: Sensitivity of CT-PNS to identify disease

Area of disease	Endoscopy		CT-PNS		Intra-operative endoscopy findings	
	No. of slide	Percent age	No. of slide	Percent age	No. of slide	Percent age
Frontal recess	1	1.6%	4	6.4%	4	6.4%
Sphenoethmoid recess	2	3.2%	10	16.3%	8	13.3%
Osteomeatal complex	35	58%	35	58%	33	55%
Maxillary	--	--	40	67%	38	63.33%

Table 5: Sensitivity of CT PNS v/s nasal endoscopy to identify anatomic variants

ANATOMICAL VARIANTS	OUR STUDY (N=30)		
	Pre-op. findings	Intra-op. Findings	CT
Deviated nasal septum	17(57%)	15	15(50%)
Septal spur impinging on middle meatus &/or contact area between MT and septum	4(13%)	04	4(13%)
Middle turbinate (hypertrophied/polypoidal)	1(3.3%)	03	1(3.3%)
Concha bullosa (unilateral/bilateral)	7(23%)	05	5(17%)
Paradoxical middle turbinate	3(10%)	03	1(3.3%)
Abnormal uncinate process	5(17%)	05	1(3.3%)
Accessory ostia	2(7%)	02	0
Haller cells	0	01	1 (3.3%)
Suprabullar cell	0	02	2(6.66%)
Agger nasi	1(3.3%)	03	3(10%)

DISCUSSION

The present study has attempted to standardize an organized method for complete nasal endoscopic and CT evaluation to find out the causal factor for the patient's complaints. As the study evaluated and analyzed, the most common symptoms were nasal obstruction (93.4%); nasal discharge (53.4%); Sneezing (40%) and headache (33.4%). Most of the cases presented before developed symptoms pertaining to the ear. endoscopic examination revealed that 35 sides (58%) had polypoidal change in the osteomeatal complex while CT-PNS revealed 40 sides (67%). Half of the above cases (20 sides- 34%) had anatomical variations of either middle turbinate or uncinate process and/or with a contact area with a localized spur or deflection of the nasal septum. Polypoidal change in the osteomeatal complex in these cases was a secondary pathology. In the remaining half of the cases only edema of the osteomeatal complex mucosa was found.^[5] cases (17%) had bilateral diffuse sinonasal polyposis. Hence CT-PNS was found to be more sensitive than nasal endoscopy. Sometimes fallacies do exist in interpretation of CT PNS. Occasionally grossly hyperplastic mucosa may appear on CT as a mildly enhancing polypoidal mass.^[2] Cases in the present study were misdiagnosed on CT with a polypoidal mass in the maxillary sinus with secondary infection and debris. In one case Maxillary sinus endoscopy revealed only hyperplastic mucosa with secondary infection and with extrafungal fungal debris. MRI may be helpful in such cases.^[6] Signal intensity depends on the degree of hydration. Hyperplastic mucosa has low signal intensity on T1 weighted images and high signal intensity on T2 weighted images. Sinonasal polyps have mixed signal intensity on T1 and T2 weighted images. It depends on the water content of polyp, mucosal hypertrophy and sinonasal secretions. In revision cases CT cannot readily differentiate

between fibrosis and hyperplastic disease aside from other signs evident on CT such as overall pattern of disease and presence of sclerosis of bony walls.^[7] Freidman and Katsantonis revealed the-role of CT in 34 patients previously operated with chronic sinusitis. They found the sensitivity of CT as 100% in identifying the pathology but the specificity as 88%. It is due to inability of readily differentiating between fibrosis and hyperplastic mucosal disease. They also established that the ethmoid was the most common site of recurrence. Kaluskar et al in their study of correlation of the CT and intraoperative endoscopic findings, showed that though the maxillary sinuses correlated well yet in the ethmoids the mucosal disease was found to be far more spread than detected on CT scan.^[8] In the present study, 60 sides were operated by using the Messerklinger technique and removed all hyperplastic mucosa identified on CT. In all cases middle turbinate was preserved. Anterior ethmoids were opened in 35 cases (58%) and posterior ethmoids were opened in 11 cases (18%). Intact bulla technique of infundibulotomy was possible in only 5 cases (8%) wherein there was only limited infundibular type of disease pattern on CT. Sphenoid sinus surgery was done in only those patients who have significant disease in sphenoid area on CT (3 cases-5%). However in presence of minimal disease, only the ostium was widened preserving the sphenoid sinus mucosa (1 case). If significant stenosis was identified on CT, frontal recess surgery was done (4 cases- 7%). In a study by Gady Har et al 6 Mitomycin-C has been used as a topical antineoplastic antibiotic for prevention of frontal recess stenosis.^[9]

In 1987 W.E.Bolger et al, studied coronal plane CT scan of 202 patients, noted the incidence of bony anatomic variants as follows. Paradoxical curvature of the middle turbinate was found in 26.1% of patients, Haller's cells in 45.1%, pneumatization of uncinat process in 2.5% and lamellar cell of the middle turbinate was seen in 46.2% of the cases. In 31.2% pneumatization was noted in the bulbous part of the turbinate and 'true' concha bullosa in 15.7% of the patients.^[10] The agger nasi cell was present in 98.5% of patients, crista galli pneumatization in 83.7%, and bulla galli in 5.4% and deviated 13 nasal septum in 18.8%. on the other hand NS Jones et al showed some contradictory findings that, bony anatomical variations appear not to influence the prevalence of rhinosinusitis. Intrinsic mucosal disease is probably of much more importance than the bony anatomy. He compared 100 CT scans from patients with rhinosinusitis with 100 CT scans from patients with intraorbital disease. The results showed no significant bony anatomical differences between the rhinosinusitis group and the control group and there remained no difference when 17% of the control group, who were incidentally found to have mucosal changes, were excluded from the control data. None of the anatomical bony variations compared between the two groups showed any significant difference, including any associated with narrowing of the ostiomeatal complex (P = 0.41). The incidence of various anatomical variants interfering with the physiology of the osteomeatal unit in the present study was as follows [Table 5]. In a study by Nayak et,^[13] al evaluated the efficacy of endoscopic assisted septoturbinoptasty. This study was conducted at the Kasturba Hospital Manipal between 1993 & 1999. It comprised 480 cases with a follow-up of 3 months to 6.6 years. The result revealed that nasal endoscopy was more sensitive in detecting osteomeatal anatomic variants.

The limitations of the present study were small sample size, lack of long term follow-up and lack of objective assessment of outcome based on olfactory testing.^[11-12]

CONCLUSION

The study conclude that nasal endoscopy was more specific in detecting osteomeatal anatomic variants whereas CT scan is more sensitive for parameters

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