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Original Research Article

TO STUDY THE ROLE OF CORONAL PLANE CT SCANS OF PARANASAL SINUSES IN PLANNING AND PRE-OPERATIVE EVALUATION FOR ENDOSCOPIC SINUS SURGERY

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Abstract

Background & Methods: The aim of the study is to study the role of coronal plane CT scans of paranasal sinuses in planning and pre-operative evaluation for endoscopic sinus surgery. All patients were subjected to thorough ENT examination with special emphasis on anterior and posterior rhinoscopy. On anterior rhinoscopy, condition of nasal mucous membrane, nature of discharge, patency of nasal cavity, deviation of septum, status of middle and inferior turbinate as regards hypertrophy, atrophy, paradoxical curvature and presence or absence of polyps were recorded.

Results: Mucosal abnormality detected on CT scan PNS coronal view, ranged from minimal mucosal thickening to total sinus opacification. The most frequently involved sinus area was the maxillary sinus, followed by anterior ethmoid involvement. Sphenoid sinus was the least commonly involved. The chi-square statistic is 6.0444. The *p*-value is .01094. The result is significant at $p < .05$.

Conclusion: Chronic rhinosinusitis is fairly a common disease condition affecting most commonly the age group between 10-20 years. The chief symptoms of all patients were nasal discharge, nasal obstruction and headache. Combination of CT scan PNS & fiber optic diagnostic nasal endoscopy is excellent for precise evaluation of nasal cavity.

Keywords: coronal plane, sinuses, endoscopic & sinus.
Study Design: Prospective Observational Study.

1. Introduction

Over the years, an increasing appreciation of the complexity of the anatomy and physiology of the nose and paranasal sinuses has evolved. Surgeon's knowledge of lateral nasal wall anatomy, its relation to surrounding vital structures and knowledge of plethora of sinonasal anatomic variations with their surgical implications is the cornerstone for both, the interpretation of CT scan PNS and safe and successful performance of intranasal endoscopic sinus surgery[1].

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In recent years, functional endoscopic sinus surgery (FESS) has gained wide spread acceptance among Otorhinolaryngologists. It removes localized nasal disease that obstructs critical passages and thereby restores normal mucociliary drainage and ventilation[2]. Preoperative planning for FESS requires high resolution computed tomography (CT) to provide detailed maps, which are used for navigation and visualization of the anatomical variants that result in sinus disease. As a result it has become imperative for radiologists and clinicians to improve understanding and communication concerning this area[3].

Experience with CT scan as a measure of diagnostic modality has accumulated rapidly since its clinical introduction in 1973. In comparison with conventional tomography, Computerised Tomography has provided better soft tissue discrimination while simultaneously visualizing the bone. The usefulness of coronal CT scan PNS to evaluate the topographic relations of confines of ethmoidal labyrinth as coronal section CT scan PNS sequentially presents the anatomy along the antero-posterior (AP) axis as encountered by the endoscopists[4]. More importantly coronal section provides information about various anatomic variants and relationship of these structures and sinuses to adjacent vital structures as they are seen from the surgeon's view point thus reducing the chances of developing any complications[5].

2. Material and Methods

Study was conducted at Tertiary Health Care Centre at Central India on 122 patients, Patients with clinical evidence of chronic rhinosinusitis with or without nasal polyposis was evaluated with Nasal endoscopy and CT scan PNS coronal view.

All patients were subjected to thorough ENT examination with special emphasis on anterior and posterior rhinoscopy. On anterior rhinoscopy, condition of nasal mucous membrane, nature of discharge, patency of nasal cavity, deviation of septum, status of middle and inferior turbinate as regards hypertrophy, atrophy, paradoxical curvature and presence or absence of polyps were recorded. On posterior rhinoscopy, the nature of discharge when present in choana and nasopharynx noted, posterior ends of turbinates assessed, presence of mass or polyp with status of nasopharyngeal end of Eustachian tube recorded.

3. Result

TABLE 1: AGE WISE SEX DISTRIBUTION

AGE	TOTAL CASES	%	MALE	%	FEMALE	%
10-20	40	32.79	26	21.31	14	11.48
21-30	26	21.31	14	11.48	12	9.84
31-40	28	22.95	14	11.48	14	11.48
41-50	14	11.48	08	6.56	06	4.92
>50	14	11.48	12	9.84	02	1.64
TOTAL	122	100	74	60.66	48	39.34

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As revealed by the above table ,the various cases in % of the groups are ; group 10-20 (32.79%) ; 22.95% cases in age group 31-40; 21.31% cases in group 21-30 years age.

TABLE 2: CLINICAL SYMPTOMS

SYMPTOMS	NO OF PATIENTS	PERCENTAGE
NASAL DISCHARGE	122	100%
NASAL OBSTRUCTION	112	91.80%
HEADACHE	62	50.82%
SNEEZING	30	24.59%
NASAL MASS	58	47.54%
EPISTAXIS	06	4.92%
EAR (discharge/heaviness)	04	3.28%
POST NASAL DRIP	90	73.77%

The most common symptom was nasal discharge (100%) cases and next were nasal obstruction (91.80%), PND (73.77%) followed by headache (50.82%).

TABLE 3: CT SCAN DETECTION OF SINUS INVOLVEMENT (MUCOSAL CHANGES)

SITE OF INVOLVEMENT	NO. OF PATIENTS	B/L	U/L
Frontal	21	11	10
Anterior ethmoid	49	23	26
Posterior ethmoid	31	20	11
Maxillary	56	21	35
Sphenoid	14	06	08

Mucosal abnormality detected on CT scan PNS coronal view, ranged from minimal mucosal thickening to total sinus opacification. The most frequently involved sinus area was the maxillary sinus, followed by anterior ethmoid involvement. Sphenoid sinus was the least commonly involved. The chi-square statistic is 6.0444. The p-value is .01094. The result is significant at $p < .05$.

4. Discussion

Computerized tomographic imaging of sinonasal region has become the gold standard in the evaluation of patients with chronic rhinosinusitis. Its ability to accurately map out the bony and soft tissue anatomy of the paranasal sinus has proven invaluable to the endoscopic surgeon in the diagnostic workup of the surgical candidate[6].

It depicts the anatomical variations of PNS in a much simpler way and helps the surgeon in preventing untoward complication during surgery[7]. It requires coordination between radiologist and endoscopic surgeon so that all the anatomical variations can be seen

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preoperatively and thus intraoperative complications can be reduced. Endoscopic surgery should be performed in a stepwise manner enabling the journey of endoscopic surgeon safe. Ashok K Gupta et al (2012)[8].

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Endoscopic examination in conjunction with computed tomography (CT) has proven to be ideal combination in recent years and are already accepted as the "Standard of Care" for sinus diseases.

It depicts the anatomical variations of PNS in a much simpler way and helps the surgeon in preventing untoward complication during surgery. It requires coordination between radiologist and endoscopic surgeon so that all the anatomical variations can be seen preoperatively and thus intraoperative complications can be reduced. Endoscopic surgery should be performed in a stepwise manner enabling the journey of endoscopic surgeon safe[9].

5. Conclusion

A detailed analysis of coronal plane CT scan of paranasal sinuses was done and various structures and anatomical variations of lateral nasal wall were evaluated as with special attention towards the ostiomeatal complex region. Coronal CT Scan was found to be a useful preoperative evaluation tool because of the advent of FESS, CT of the paranasal sinuses has gained considerable importance.

Chronic rhinosinusitis is fairly a common disease condition affecting most commonly the age group between 10-20 years. The chief symptoms of all patients were nasal discharge, nasal obstruction and headache. Combination of CT scan PNS & fiber optic diagnostic nasal endoscopy is excellent for precise evaluation of nasal cavity.

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