Int. J Med. Pharm. Res. (P-ISSN: 2958-3675 | E-ISSN: 2958-3683)
Available on: https://ijmpr.in/

International Journal
of Medical and
Pharmaceutical Research

ORIGINAL ARTICLE **OPEN ACCESS**

A STUDY TO EVALUATE INCIDENCE OF ANATOMICAL VARIATIONS IN NOSE AND PARANASAL SINUS REGION BY COMPUTED TOMOGRAPHY

Sk Neeha Zaheena*,Sriramaneni Venkateswar Rao[2]

[1]Final year Post graduate resident, Department of Radio-diagnosis, ASRAM Medical College, Eluru, A.P, India.
[2] Professor & Head, Department of Radio-diagnosis, ASRAM Medical College, Eluru, A.P,India.

OPEN ACCESS

Corresponding Author
Sk Neeha Zaheena
Final year Post graduate resident, Department of Radio-diagnosis, ASRAM Medical College, Eluru, A.P, India.

Received: 10-03-2024
Accepted: 22-06-2024
Available online: 28-06-2024

©Copyright: IJMPR Journal

ABSTRACT

AIMS AND OBJECTIVES:TO study the frequency of occurrence of anatomical variations in nose and paranasal sinus region among patients after medical management with persisting symptoms of chronic rhinosinusitis.To know the demographic distribution of anatomical variations of nose and paranasal sinus region.

MATERIALS AND METHODS:In this study ,CT scan of paranasal sinus will be carried out on 100 patients clinically diagnosed of chronic rhinosinusitis.Duration of this study is for 2years .Plain CT paranasal sinuses perfomed on GE revolution ACT machine (50 slice). RESULTS:Deviated nasal septum was the most common variation in 62% followed by sphenoid sinus septations in 49%.Other variations found were middle concha bullosa in 43% patients.Paradoxical middle turbinate in 14%,horizontal uncinate process in 43%,over pneumatised ethmoidal bulla in 35%,frontal sinus septations in 31%,superior concha bullosa in 20%,prominent agger nasi cells in 26%,haller cells in 11%,onodi cells in 6%,maxillary sinus septae in 12% and pneumatisation of uncinate process in 5% patients.

CONCLUSION:The presence of anatomical variants does not indicate a predisposition to sinus pathology but these variations may predispose patients to increase risk of intraoperative complications.The radiologist must pay close attention to anatomical variants in the postoperative evaluation and provide a road map to surgeon and help avoid possible complications and improve success of management strategies.

Key Words: *Paranasal sinuses, deviated nasal septum, concha bullosa, onodi cell, agger nasi cell.*

INTRODUCTION:-

Paranasal sinuses (PNS) are a group of air filled spaces developed as an invagination of the nasal mucosa into the lateral nasal wall, frontal, ethmoid, maxilla and sphenoid bones [1] . Variations in the pneumatisation of the paranasal sinuses may disturb sinus ventilation and hence can be the etiological factor for sinusitis and spread of infection to adjacent structures such as orbit, cranium and thus it becomes necessary for the otorhinolaryngologist to be aware of these variations. Chronic rhino sinusitis (CRS) is one of the most common chronic diseases and affects nearly 50 million individuals every year worldwide.During the past two decades, the concept of sinusitis and its management has undergone tremendous changes. Computerized Tomography (CT) has become the standard diagnostic tool in evaluation of paranasal sinuses. The Acquisition of an excellent definition of the sinus anatomy for a pre-operative endoscopic evaluation can be done by means of CT, which is the gold standard in the study of such structures[5]. CT scan evaluation of the patients, who have to eventually undergo Functional Endoscopic Sinus Surgery (FESS), is extremely useful in confirming the clinical diagnosis of chronic rhinosinusitis as well as understanding the anatomical variations that may predispose to rhinosinusitis and nearby vital structures, so that iatrogenic damage can be avoided[5]. One of the aims of CT of the sinuses is to define any anatomical variants and relationship of the sinuses with the surrounding important structures. CT. Data from Preoperative CT scans would provide information regarding the anatomical variations in the paranasal sinuses. The success of functional endoscopic surgery depends on adequate knowledge of the complicated anatomy of the paranasal sinuses, which is variable. The anatomical knowledge on these structures is critical for endoscopic surgeons to avoid therapeutic failures and iatrogenic complications. Straying beyond the surgical field may lead to serious iatrogenic complications such as CSF leak, meningitis and/or blindness. So a detailed knowledge of possible anatomical variations is essential to reduce the surgical complication rates during FESS, helps explain recurrence of disease and allows one to change the operative technique.

MATERIALS AND METHODS :-

An analytical cross-sectional study was performed in the department of Radiodiagnosis and imaging, ASRAM Medical college, Eluru in co-ordination with departments of ENT, during the period of May 2022 to May 2024. All the patients who were sent to the radiology department by ENT outpatient department having been diagnosed as chronic rhinosinusitis depending upon the criteria given by AAO-HNS, Task force 1997, not responding to medical treatment with full course of antibiotics, analgesics and decongestants for three months duration and who were willing to undergo CT scanning of paranasal sinuses.

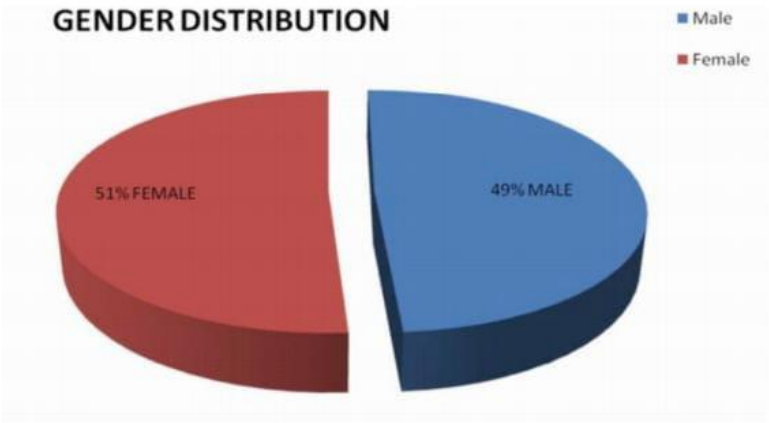
After approval of the Institutional Ethics committee HUNDRED patients who were clinically diagnosed consecutive cases of chronic rhinosinusitis and underwent CT scan were selected for the study and were subjected to detailed history taking and examination and CT scan findings were assessed after excluding patients who fall under exclusion criteria.

Written informed consent was taken from the subjects. Anatomical findings in nose and paranasal sinus region was assessed simultaneously.

IMAGING TECHNIQUE AND PROCEDURE:-

Prior to subjecting the patients for radiographic examinations, age, sex and detailed clinical history was attained with complete physical examination.Direct axial sections were taken with coronal and parasagittal reconstructions. Plain CT paranasal sinuses perfomed on GE revolution ACT machine (50 slice).The CT examination is performed with the patient in supine position in axial plane with 1 mm interval contiguous cuts along the skull base with a activion 16 Slice CT Scan Machine and images are reconstructed 2 mm in the coronal plane perpendicular to the hard palate which is taken as the reference axis. Coronal sections provide good information required for disease clearance56 and are preferred as they have an advantage over axial CT scans in that it shows progressively deeper structures as encountered by the surgeon during surgery.

Results and Discussion

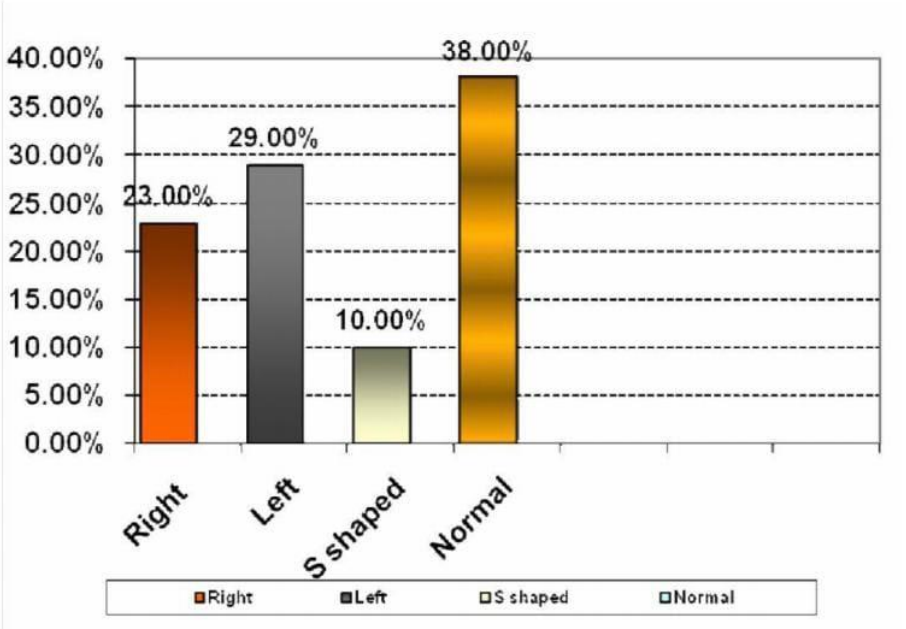


GENDER DISTRIBUTION

GENDER	FEMALE	MALE
100	51	49

Frequency of occurrence of deviated nasal septum

	Frequency	Percent	Chi square	P value
Normal	38	38%	16.560	0.001
Left	29	29%		
Right	23	23%		
S shaped	10	10%		
Total	100	100%		



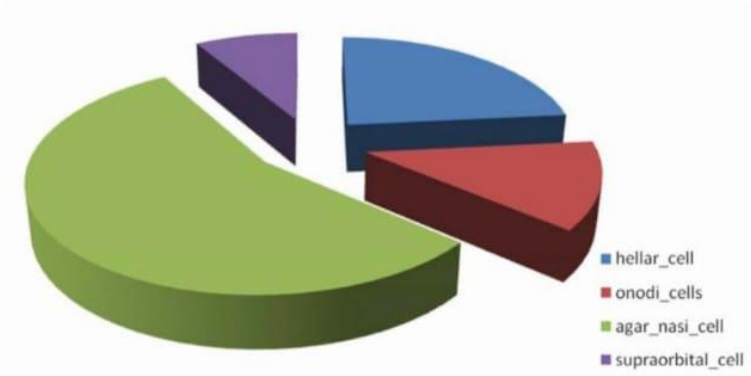
OCCURRENCE OFDIFFERENT SPECIAL CELLS

HALLAR CELL	Frequency	Percent	Chi square	P-value
Absent	89	89	64	0.000
Present	11	11		
Total	100	100		

ONODI CELL	Frequency	Percent	Chi square	P value
Absent	94	94	77.44	0.000
Present	6	6		
Total	100	100		

AGAR NASI CELL	Frequency	Percent	Chi square	P value
Absent	74	74	83.06	0.000
Present	26	26		
Total	100	100		

SUPRAORBITAL CELL	Frequency	Percent	Chi square	P value
Absent	96	96	84.64	0.000
Present	4	4		
Total	100	100		

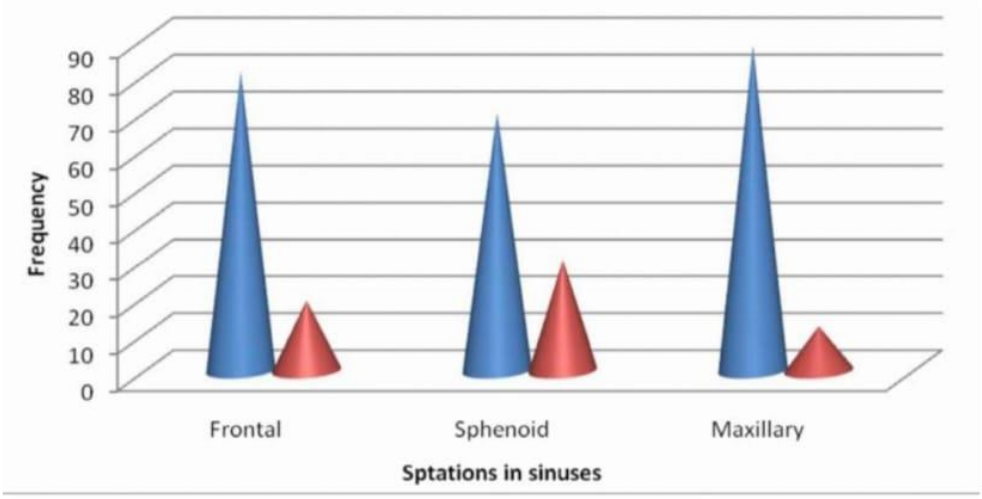


SEPTATIONS IN DIFFERENT SINUSES

Frontal sinus septations	Frequency	Percent	Chi square	P value
Absent	81	81	38.4	0.000
Present	19	19		
Total	100	100		

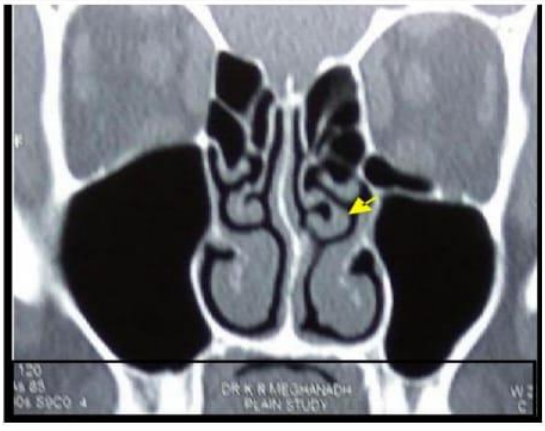
Maxillary sinus septations	Frequency	Percent	Chi square	P value
Absent	88	88	37.6	0.000
Present	12	12		
Total	100	100		

Sphenoid sinus septations	Frequency	Percent	Chi square	P value
Absent	70	70	16.0	0.000
Present	30	30		
Total	100	100		

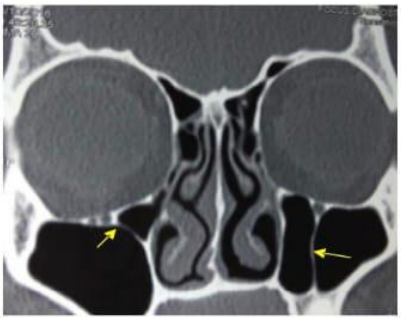


Case 1 bilateral concha bullosa

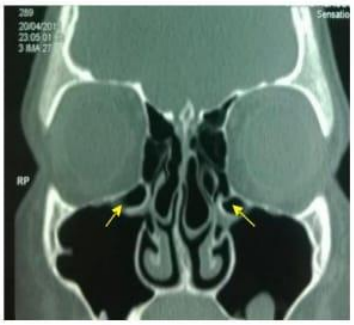
Case.2DNS TO RIGHT



Case 3 Paradoxical MT



Case 4 MAXILLARY SEPTATION



Case 5 : BILATERAL ONODI CELL

CT Images

Case 6: AGAR NASI CELL

DISCUSSION:-

Deviated nasal septum was the most common variation in 62% followed by sphenoid sinus septations in 49%. Other variations found were middle concha bullosa in 43% of patients. Paradoxical middle turbinate in 14%, horizontal uncinate process in 43%, over pneumatised ethmoidal bulla in 35%, frontal sinus septations in 31%, superior concha bullosa in 20%, prominent agger nasi cells in 26%, Haller cells in11%, Modi cells in 6%, maxillary sinus septae in 12% and pneumatisation of uncinate process in 5% patients.

CONCLUSION:-

The presence of anatomical variants does not indicate a predisposition to sinus pathology but these variations may predispose patients to increased risk of intraoperative complications. The radiologist must pay close attention to anatomical variants in the postoperative evaluation to provide a road map to the surgeon to help avoid possible complications and improve the success of management.

REFERENCES:-

1. Kennedy DW, Bolger WE, Zinreich SJ. Diseases of the sinuses: diagnosis and management. PMPH-USA; 2001.
2. Kennedy DW, Zinreich SJ. The functional endoscopic approach to inflammatory sinus disease: current perspectives and technique modifications. American Journal of Rhinology. 1988 Jul 1; 2(3):89-96.
3. Mosher HP. LXXII. Symposium on the Ethmoid the Surgical Anatomy of the Ethmoidal Labyrinth. Annals of Otology, Rhinology & Laryngology. 1929 Dec 1; 38(4):869-901.
4. Sheetal D, Devan PP, Manjunath P, Martin P, Satish Kumar K, Sreekantha ST, Manjunatha GB. CT PNS–Do We ReallyRequire Before FESS? J Clin Diagn Res. 2011; 5(2):179-81.
5. Zojaji R, Mirzadeh M, Naghibi S. Comparative evaluation of preoperative CT scan and intraoperative endoscopic sinus surgery findings in patients with chronic rhinosinusitis.2008; 5(2) 77-82
6. CT Images 24 Schaefer SD. Endoscopic sinus surgery: posterior approach. Operative Techniques in Otolaryngology-Head and Neck Surgery. 1990 Jun 30; 1(2):104-7.
7. Bolger WE, Parsons DS, Butzin CA. Paranasal sinus bony anatomic variations and mucosal abnormalities: CT analysis for endoscopic sinus surgery. The Laryngoscope. 1991 Jan 1;101(1):56-64.
8. Mavrodi A, Paraskevas G. Evolution of the paranasal sinuses' anatomy through the ages. Anatomy & cell biology. 2013 Dec 1;46(4):235-8.
9. Gazi A. Dictionary of the Greek language. Athens: Mati. 1839. Haanaes HR, Pedersen KN. Treatment of oroantral communication. International journal of oral surgery. 1974 Jan 1;3(3):124-32.