



CT EVALUATION OF PARANASAL SINUS PATHOLOGIES

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ABSTRACT

There are millions of patients suffering from para nasal sinuses pathology, which ranges from minor inflammatory/Infective conditions to complicated malignant carcinoma. The clinical examination and the conventional imaging have proved to be inadequate tool in the differentiation and characterization of the these condition not only due to the complexity of the pathology but also due to the anatomical abnormalities complicating the situation. The present study was done to evaluate the effectiveness of CT imaging in different sinus pathologies. A total of 50 patients were included in the study with strong clinical suspicion of sinus pathology. The CT accuracy for inflammatory lesions in the study was found to be 86%, for benign lesions it was 90% and for malignant lesions 90%. CT appeared to be a modality of choice for differentiating and characterizing the paranasal sinuses pathologies thus providing a road map for proper management.

KEYWORDS

paranasal, sinonasal, sinusitis

Introduction:

Pathological lesions of the paranasal sinuses include a wide spectrum of conditions ranging from inflammation to neoplasms both benign and malignant. Preliminary investigations by standard sinus radiographs are sub-optimal in displaying regional morphology of osteomeatal area, Ethmoid & Sphenoid sinuses and anatomical variants. Further there is overlapping between these structures making diagnosis insufficient as a guide to endoscopic sinus surgery & modified PNS surgeries.

The advent of CT has revolutionized the imaging of the PNS due to its multiplanar imaging capability and its ability in utilizing differential contrast enhancement characteristics of lesions. CT scan has proved to be an excellent imaging tool as it can accurately diagnose & differentiate between benign & malignant lesions, can describe the masses in terms of their origin, nature, extension, & involvement.

Today CT has become the imaging modality of choice in PNS pathology not only for diagnostic purpose but also to create a intra-operative road map for management.

The present study was conducted to establish the role of CT in evaluation and differentiation of PNS pathologies and its correlation with clinical findings.

Materials & Method:

The study was done in the Department of Radiodiagnosis, MGM Medical College and Department of ENT, Modern Institute of Medical Sciences, Indore, Madhya Pradesh.

A total of 50 patients with clinical suspicion of PNS pathology underwent CT evaluation of PNS from January 2015 to December 2015. Patients with history of trauma were excluded.

Equipments & Techniques:

CT examination was performed on fourth generation Siemens Somatom 64 Multi slice CT scanner. The imaging was done in coronal, axial & sagittal planes.

Study Protocol:

1. A detailed history of the patient including signs and symptoms, detailed physical examination, biochemical investigations and radiological investigations which included PNS x -ray were recorded and tabulated.
2. A written consent was taken

3. Iodinated IV contrast agent is given if required.
4. The patient was then placed on the gantry table in prone position.
5. The coronal scan is taken from posterior margin of sphenoid sinus to anterior margin of frontal sinus and rest of the planes are reconstructed from it.

Result and Observation:

The majority of the cases were of age group 16-30 which were 36% cases followed by 30% in age group 31-45 yrs.

The most common symptoms were Nasal obstruction (50%), followed by Nasal discharge (49%).

28 patients was clinically diagnosed as having sinonasal inflammatory disease, 12 were diagnosed having polyp, 7 patients having malignant sinonasal mass, other disease include angiofibroma was diagnosed in 2 cases.

Most common anatomical variations seen was Deviated nasal septum (48%) more commonly on right sided, followed by agger nasi in 48% of cases.

On CT maxillary sinuses was seen to be most commonly involved in the study (82 % cases), followed by the ethmoid sinuses (anterior group 77% cases, post group 40 %case). The most common radiological pattern of sinus involvement is unclassified type seen in 33% of cases, followed by ostiomeatal pattern in 26% cases.



Image 1: Sinonasal Polyp



Image 2: Esthesioneuroblastoma

Table 2: Classification Of Cases On The Basis Of Pathologies

Pathology	No. Of Cases
Sinusitis	16
Polyp	12
Mucocele	4
Fungal	3
Granulomatous	2
Angiofibroma	2
Papilloma	1
Osteoma	1
Fibrous Dysplasia	1
Carcinoma	7
Esthesioneuroblastoma	1
Total	50

Discussion:

The majority of the cases in our study were of the age group 16 - 30 years (38%) followed by 31-45 years (30%). The findings are in concordance with the study done by Rashmi Kandukuri et al¹.

In our study, 52% of the cases were male while 48% were female with marginal preponderance for male.

Patients presented with overlapping symptoms in most cases, of which the most common presenting complain was nasal obstruction(50%) followed by nasal discharge(48%), which is consistent with the study conducted by Verma et al².

The most common anatomical variation was DNS followed by Agger nasi. The findings are consistent with the study done by Katya et al³.

The most common PNS pathology was sinusitis, it is classified as bacterial, viral, fungal, acute, or chronic sinusitis and based on region involved sinonasal or purely nasal or sinusal. In our study the most common pattern of involvement was sinonasal (52%) with maxillary sinus being the most common sinus involved (82%) followed by posterior ethmoidal (76%), which is consistent with the study done by Vijay Prabhu et al⁴.

On the basis of mucosal thickening most common pattern noted is circumferential (8%) follow

ed by irregular (2%).This finding is supported by Carmeli et al⁵.

Fungal sinusitis is a chronic form of inflammation which shows complete opacification of sinus, bony erosion, and calcification with involved sinus showing higher attenuation than bacterial sinusitis. In our study 3 patients had fungal sinusitis, of which nasal involvement was seen in 16% and bony erosion and calcification seen in 30% and 50% respectively. On follow up 3 patients were diagnosed as malignant mass. Therefore diagnostic accuracy of CT for fungal sinusitis in our study was 50%. It is similar to study done by Han DH et al⁶.

In our study 12 cases were diagnosed as antrochoanal polyp in which sinonasal involvement was seen in 10 cases. On follow up 2 cases were diagnosed as rhinosinusitis. So the diagnostic accuracy for polyp in our study was 90% which is consistent with the study done by Gupta et al⁷.

Granulomatous disease is characterized by mucosal thickening, bony sclerosis and calcification. In our study 2 cases were diagnosed as granulomatous disease. 1 was sinonasal and 1 was purely nasal. The diagnostic accuracy in our study is 100% which is in concordance with study done by Bakshi j et al⁸.

Two cases were diagnosed having angiofibroma all of which showed involvement of the pterygopalatine fossa, bony erosion was seen in one case. The diagnostic accuracy in our study is 100%

and is consistent with the study of Gomaa MA et al⁹.

Ill defined mass lesion with soft tissue involvement, bony erosion was seen in 7 cases patients categorized as carcinoma. 2 cases showed intracranial extension. On follow up 1 case was diagnosed as lymphoma. So the diagnostic accuracy for carcinoma in our study was 90%. The observation is similar to study done by Martyn Lenz et al¹⁰.

Conclusion:

The present study was undertaken to determine the role of CT in evaluation of PNS pathology and its potential role in differentiating benign from malignant lesion. 50 patients with complains of PNS pathology were imaged.

The study showed high accuracy, sensitivity and specificity in differentiation and characterization of inflammatory, benign and malignant lesions of PNS. The CT accuracy for inflammatory lesions in the study was 86%, for benign lesions it was 90% and for malignant lesions 90%.

Thus Computed Tomography has high accuracy, sensitivity and specificity for detection, characterization and differentiation of inflammatory, benign and malignant lesions of PNS.

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