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Original research article

ETHMOIDAL POLYP: RADIOLOGICAL EVALUATION AT A TERTIARY CARE HOSPITAL

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Abstract

The introduction of Spiral CT and Multidetector CT capable of multiplanar reconstructions has improved the diagnostic aspects of PNS by providing excellent details of anatomy, anatomic variants and pathology (inflammatory and neoplastic conditions) of PNS serving as pre-operative "ROAD MAP" called SSCT (Screening sinus CT) to the modern sinus surgeon to treat patients more effectively and reducing complications associated with Functional Endoscopic Sinus Surgery (FESS). History was taken from each patient followed by clinical examination. Basic investigations like routine blood examination and routine urine examination were done whenever required. Diagnosis was confirmed by characteristic imaging features of masses or post-operative histopathological reports. Follow up of the patients was done by taking details of treatment and procedures done on the patients. In this study, plain radiographic findings were sinus opacification (100%), bilateral nasal haziness (58.06%) and unilateral nasal haziness (41.93%).On MRI, obliteration of nasal cavity (100%), extension of mass (93.55%), mass effect (90.32%) and enlargement of ethmoid infundibulum (90.32%) were seen. In present study, CT and MRI were able to correctly diagnose ethmoidal polyp.

Keywords: Ethmoidal polyp, FESS, PNS

Introduction

Etiology of ethmoidal polyp is very complex and not well understood. They may arise in inflammatory conditions of nasal mucosa (rhinosinusitis), disorders of ciliary motility or abnormal composition of nasal mucus (cystic fibrosis) [1].

Nasal mucosa particularly in the region of middle meatus and turbinate becomes edematous due to collection of extracellular fluid causing polypoidal change.

They always arise from the lateral wall of nose usually from the middle meatus. Common sites are uncinate process, bulla ethmoidalis, ostium of ethmoid sinus, medial surface and edge of middle turbinate.

On CT, extensive mucosal polyps are noted occupying and obliterating the nasal cavity and the paranasal sinuses. Associated local bone remodelling or erosion is noted [2].

In last two decades, CT scan has replaced plain radiography as the imaging modality of

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choice in the assessment of paranasal sinus pathologies with its unique ability to image both bones and soft tissues reliably and more accurately defining the cause and extent of both inflammatory and neoplastic diseases of the PNS. CT and MRI have provided more precise differential diagnosis and greater detail about the anatomic extent of the diseases of PNS [3].

The introduction of Spiral CT and Multidetector CT capable of multiplanar reconstructions has improved the diagnostic aspects of PNS by providing excellent details of anatomy, anatomic variants and pathology (inflammatory and neoplastic conditions) of PNS serving as pre-operative "ROAD MAP" called SSCT (Screening sinus CT) to the modern sinus surgeon to treat patients more effectively and reducing complications associated with Functional Endoscopic Sinus Surgery (FESS).

Hence, it is now mandatory and a medico legal requirement to evaluate PNS and nose before FESS. CT excels over MRI at evaluating fine bone details, assessment of fibro osseous lesions of PNS and sino facial trauma [4].

Excellent knowledge of sinus anatomy and its variation has become mandatory for radiologic interpretation and reporting. Familiarization with the radiologic landmarks and cross-sectional anatomy, along with clinical correlation, can further improve the reader's ability to interpret sinus CT findings [5].

Although bone is not directly imaged on MR imaging, invasion of bone marrow and gross bone erosion can be easily identified. MR contrast-enhanced studies may also help in differentiating between entrapped secretions and a solid mass, as there is peripheral enhancement of uniformly thick, inflamed mucosa around secretions, whereas there usually is enhancement of a tumor nodule either centrally or along the margin of a neoplasm [6].

Methodology

It was a prospective study to assess paranasal sinus masses by X-Ray, Computed Tomography and Magnetic Resonance Imaging.

Sample size: One hundred and two (102) subjects.

Source of Data

The main source of data for this study were the patients referred from the Departments of ENT, General Medicine, Dental and Ophthalmology with upper respiratory tract symptomatology where imaging revealed paranasal sinus masses.

Informed consent was obtained from the subjects before the commencement of the investigations.

Inclusion Criteria

Patients of all age groups presenting with suspected paranasal sinus masses where imaging reveals paranasal sinus masses will be included in this study.

Exclusion Criteria

1. Previous evidence of sinonasal surgery.
2. All cases of trauma.

Clinical assessment

In all cases thorough history taking and physical examination were done based on the proforma attached.

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Methods

History was taken from each patient followed by clinical examination. Basic investigations like routine blood examination and routine urine examination were done whenever required.

Diagnosis was confirmed by characteristic imaging features of masses or post-operative histopathological reports. Follow up of the patients was done by taking details of treatment and procedures done on the patients.

Results

Table 1: Age distribution of Ethmoidal polyp

Age group (years)	No of cases	Percentage
2-11	2	6.45%
12-21	1	3.23%
22-31	7	22.58%
32-41	9	29.03%
42-51	8	25.81%
52-61	4	12.90%
Grand Total	31	100%

In present study of 102 paranasal sinus masses, ethmoidal polyp was seen in 30.4% (31/102) of the total cases. The incidence of ethmoidal polyp was common in 32 - 41 years age group with 29.03% (9/31) of the total cases falling in this age group.

Table 2: Gender distribution of Ethmoidal polyp

Sex	No of cases	Percentage
Females	10	32.26%
Males	21	67.74%
Grand Total	31	100%

Ethmoidal polyp was much more common in males (67.74%) than females (32.26%).

Table 3: Age wise gender distribution of Ethmoidal polyp

Age group	No of cases		Grand total
	Females	Males	
2-11	0	2	2
12-21	1	0	1
22-31	3	4	7
32-41	1	8	9
42-51	4	4	8
52-61	1	3	4
Grand Total	10	21	31

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This study shows that majority (25.8%) of the cases of ethmoidal polyp is seen in males of 32 - 41 years age group and women of 42 - 51 years age group (12.90%).

Table 4: Clinical presentation in Ethmoidal polyp

Clinical presentation	No of cases	Percentage of total
Nasal discharge	31	100%
Nasal obstruction	31	100%
Swelling in nasal cavity	31	100%
Headache	19	61.29%

The most common clinical presentation in ethmoidal polyp was nasal obstruction (100%), nasal discharge (100%) and nasal mass (100%) followed by headache (61.29%).

Table 5: Plain radiography findings in Ethmoidal polyp

Plain radiography features	No of cases	Percentage of total
Sinus opacification	31	100%
Bilateral nasal haziness	18	58.06%
Unilateral nasal haziness	13	41.93%

In this study, plain radiographic findings were sinus opacification (100%), bilateral nasal haziness (58.06%) and unilateral nasal haziness (41.93%).

Table 6: CT findings in Ethmoidal polyp

CT findings	No of cases	Percentage
Obliteration of nasal cavity	31	100%
Enlargement of ethmoid infundibulum	28	90.32%
Local bone remodelling	20	64.52%
Extension and mass effect	29	93.55%

On Computed tomography, obliteration of nasal cavity (100%), extension and mass effect (93.55%), enlargement of ethmoid infundibulum (90.32%) and local bone remodelling (64.52%) were seen.

Table 7: MRI findings in Ethmoidal polyp

MRI findings	No of cases	Percentage
Obliteration of nasal cavity	31	100%
Enlargement of ethmoid infundibulum	28	90.32%
Extension and mass effect	29	93.55%

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On MRI, obliteration of nasal cavity (100%), extension of mass (93.55%), mass effect (90.32%) and enlargement of ethmoid infundibulum (90.32%) were seen.
In present study, CT and MRI were able to correctly diagnose ethmoidal polyp.

Discussion

In the present study, the age range of patients was between 6 to 61 years with a mean age of 38.06 years. Maximum number of patients (9 out of 31) were in the age group of 32 – 41 years. Study by Jiang XD *et al*. (2011) [7] showed mean age of 42 years. Study by Jahromi AM and Pour AS (2012) [8] showed mean age of 39.5 years. Study by Munoz AT *et al*. (2008) [9] showed mean age of 46.05 years. All the above mentioned studies are correlating with the present study with respect to age.
In the present study, there were 21 males and 10 females. In the study by Jahromi AM and Pour AS (2012) [8], there were 179 males and 118 females out of 297 patients. In the study by Larsen K and Tos M (2002) [10], there were 174 males and 78 females out of 252 patients. All the above mentioned studies showed male preponderance, thus correlating with the present study.
The main presenting symptoms in this study were swelling in nasal cavity, nasal discharge and nasal obstruction which were seen in all cases (100%) followed by headache corresponding to 61.29% of cases (19 out of 31 cases). In the study by Jahromi AM and Pour AS (2012) [8], nasal obstruction was found in 81.1% of cases (241 out of 297 cases). In the study by Munoz AT *et al*. (2008) [9], nasal obstruction was the most common presenting symptom corresponding to 88% of cases (145 out of 165 patients). All the above mentioned studies are correlating with the present study with respect to pattern of clinical presentation.
Plain radiographic findings in the present study were sinus opacification (100%), bilateral nasal haziness in 58.06% of cases (18 out of 31 cases) and unilateral nasal haziness in 41.93% of cases (13 out of 32 cases). In the study by Schramm VL *et al*. (1980) [11], bilateral sinus opacification were noted in all cases of ethmoidal polyps (22 patients). Ethmoidal polyps were seen as opacification within the nasal fossa on plain radiography as mentioned in the textbook by Peter M. Som and Hugh D Curtin [12].
CT findings in the present study were obliteration of nasal cavity in all cases (100%), enlargement of ethmoid infundibulum in 90.32% of cases (28 out of 31 cases) and local bone remodelling in 64.52% of cases (20 out of 31 cases). In the study by Drutman J *et al*. (1994) [13], enlargement of ethmoid infundibulum was seen in 89% of cases (31 out of 35 cases) and local bone remodelling in 63% of cases (22 out of 35 cases). CT features in the above mentioned study are correlating with those in the present study.
MRI findings in present study were obliteration of nasal cavity, enlargement of ethmoid infundibulum and extension into adjacent structures. Study by Som PM *et al*. (1989) [14] showed extension of ethmoidal polyp into adjacent structures in all cases (14 patients). MRI features in the above mentioned study are correlating with those in the present study.

Conclusion

Thus CT had higher sensitivity (100%) to diagnose bony erosion or thinning. MRI had higher sensitivity (100%) to define the extent of disease whereas X-Rays were less sensitive (83.87%) than CT or MRI to diagnose ethmoidal polyp.

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