

## Spectrum of of nasal, paranasal sinus and nasopharyngeal mass with radiological correlation at a tertiary care hospital, Gujarat, India

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### Abstract

**Introduction:** The nasal masses are most commonly encountered condition in outpatient department of otorhinolaryngology. A sino nasal mass can have various differential diagnosis. They may be inflammatory, congenital, neoplastic (benign and malignant), traumatic in nature. Classically benign neoplasm expands and remodel bone and aggressive malignancies destroy and invade adjacent tissue with ill-defined margin[1]. Various pathologies ranging from non-neoplastic lesion to malignant tumor may present as simple nasal mass. Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas. **Aim:** This study aims to evaluate the spectrum of nasal, PNS and nasopharyngeal diseases on histopathology and correlate their age, gender, histopathological and radiological findings. **Materials and methods:** This was an observational study carried out at the Department of Pathology, at Gujarat Adani Institute of Medical Sciences, Bhuj from June 2021 to May 2022. Total 80 cases of nasal, paranasal sinus and nasopharyngeal masses were included for histopathological examination. **Results:** We studied 80 cases out of which 57 (71.25%) were male and 23 (28.75%) were females. From 80 cases, 63 (78.75%) cases were non-neoplastic in nature while 17 (21.25%) were neoplastic. Out of 17 neoplastic cases, 4 (5%) are benign tumors and 13 (16.25%) are malignant tumors. Radiological correlation seen in 79 (98.75%) cases out of total 80 (100%) cases. **Conclusions:** It can be concluded from our study that histopathological examination is mandatory for confirmatory diagnosis of any masses present in nasal, paranasal sinus and nasopharynx. Radiological investigation always play important role as it helps pathologist as well as clinician about primary diagnosis of whether benign or malignant.

**Keywords:** Nasal, paranasal sinus and nasopharyngeal mass, neoplastic and non-neoplastic lesion, radiological features.

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### Introduction

The nose is the most prominent part of the face with functional and considerable aesthetic importance. Anatomical position of the nose and its passage have been considered as the direct route to the brain, individual's source of intelligence and spirituality[2]. Presence of any mass in the nose and paranasal sinuses seems to be a simple problem; however, it raises many questions about the differential diagnosis[3]. Paranasal sinuses (PNSs) diseases commonly affect the varied range of population, which range from inflammatory conditions to neoplasms, both benign and malignant[4]. Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas[5]. Having an uncertain aetiology and tendency to recur, they represent a challenging diagnosis for the physician to treat. The causes of nasal masses in children include congenital and developmental disorders such as congenital nasolacrimal duct mucocele, dermoid cyst, cephalocele, and nasal neuroglial heterotopia; inflammatory and infectious processes such as mucocele, polyp, and pyogenic granuloma; benign neoplasms such as infantile hemangioma and juvenile nasopharyngeal angiofibroma; malignant lesions such as rhabdomyosarcoma and nasopharyngeal carcinoma; and masses related to prior trauma such as septal hematoma[6].

Therefore, nasal endoscopy, radiology and histopathology are employed collectively to help us reach the diagnosis. Advanced imaging techniques like computed tomography (CT) and magnetic resonance imaging (MRI) helps us to reach the presumptive diagnosis. CT gives superior bony definitions whereas MRI gives superior soft tissue delineation in the adjacent infratemporal fossa, masticator area, and perineural, intra-orbital, and intracranial distribution measurement[7]. Histopathological evaluation (HPE) remains the gold standard of investigation. It provides the actual diagnosis of variant conditions labelled as sino nasal masses. In all instances, histopathological analysis of the infected tissue should be done through biopsy or surgically excised specimen[8]. The present study was carried out to find out correlation of clinical, radiological and histopathological diagnosis of sinonasal masses.

### Aim

This study aims to evaluate the spectrum of nasal, PNS and nasopharyngeal diseases on histopathology and correlate their age, gender, histopathological and radiological findings.

### Materials and Methods

The present study was conducted in department of Pathology at Gujarat Adani Institute of Medical Sciences, G.K. general Hospital, Bhuj from June, 2021 to May, 2022 to evaluate histopathological features and radiological findings of nasal, paranasal sinus and nasopharyngeal masses. The present prospective observational study was conducted on 80 histopathological samples received with history

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of nasal, PNS and nasopharyngeal masses of any age and gender. The sample were received in formalin filled wide mouthed container with requisition form having detailed clinical history, age, sex, radiological investigation and site of tissue taken by FESS (Functional endoscopic sinus surgery) method by ENT department. The specimens were fixed in 10% buffered formalin. 3 to 5 microns thick sections were made from formalin fixed, paraffin-embedded blocks and stained with H & E and examined under microscope. Diagnosis was confirmed by histopathological evaluation and correlated with the radiological

diagnosis. The data so obtained was compiled, analysed and valid conclusion drawn.

#### Observations and results

Total 80 patients were included in this study. Out of 80 patients, 57 (71.25%) were males and 23 (28.75%) were females with age ranging from 15 years to 80 years (mean age 43.39 years). The most common age group involved was 21 to 40 years (34 cases, 42.5%) followed by 41 to 60 years (24 cases, 30.0%) (Table-1).

**Table 1: Age and gender wise distribution of patients**

Age group	Males (n)	Females (n)	Total
0 to 20 years	6 (7.5%)	3 (3.75%)	9 (11.25%)
21 to 40 years	28 (35%)	6 (7.5%)	34 (42.5%)
to 60 years	17 (21.25%)	7 (8.75%)	24 (30.0%)
>60 years	6 (7.5%)	7 (8.75%)	13 (16.25%)
<b>Total</b>	<b>57 (71.25%)</b>	<b>23 (28.75%)</b>	<b>80 (100%)</b>

On histopathological examination, majority of the cases were diagnosed as fungal infection (32 cases, 40%), followed by nasal polyp (30 cases, 37.5%) Total 5 (6.25%) cases were diagnosed as benign lesions and 13 (16.25%) cases were diagnosed as malignant tumors (Table-2).

**Table 2: Distribution of patients according to histopathological diagnosis**

Histopathological diagnosis	Number of cases	Percentage (%)
<b>Non neoplastic</b>		
Nasal polyp	30	37.5
Fungal infection	32	40
Inflamed dentigerous cyst	1	1.25
<b>Neoplastic</b>		
<b>Benign</b>		
Pyogenic granuloma	2	2.5
Angiofibroma	1	1.25
Ossifying fibroma	1	1.25
<b>Malignant</b>		
Nasopharyngeal carcinoma	3	3.75
BCC	3	3.75
Spindle cell tumor	1	1.25
Round cell tumor	2	2.5
Adenoid cystic carcinoma	1	1.25
High grade/ poorly differentiated malignancy	3	3.75

In our study, nasal polyps were more common (19 cases, 23.75%) in 21 to 40 years of age with male predominance, while fungal infections were common (15 cases, 18.75%) in 41 to 60 years of age with male predominance. In case of neoplastic lesions, benign lesions (3 cases, 3.75%) were more common in age group of 0 to 20 years of age with male predominance. Malignant lesions have bimodal peak in age group of 21 to 40 years and >60 years of age with each having 4 (5%) cases (Table-3).

**Table 3: Age and gender wise distribution of histopathological diagnosis**

Age group	Males (n)	Females (n)	Total
<b>Nasal polyp</b>			
0 to 20 years	2 (2.5%)	2 (2.5%)	4 (5.0%)
21 to 40 years	16 (20%)	3 (3.75%)	9 (23.75%)
41 to 60 years	4 (5.0%)	2 (2.5%)	6 (7.5%)
>60 years	1 (1.25%)	0 (0%)	1 (1.25%)
<b>Total</b>	<b>23 (28.75%)</b>	<b>7 (8.75%)</b>	<b>30 (37.5%)</b>
<b>Fungal infection</b>			
0 to 20 years	0 (0%)	0 (0%)	0 (0%)
21 to 40 years	6 (7.5%)	3 (3.75%)	9 (11.25%)
41 to 60 years	12 (15%)	3 (3.75%)	15 (18.75%)
>60 years	4 (5.0%)	4 (5.0%)	8 (10%)
<b>Total</b>	<b>22 (27.5%)</b>	<b>10 (12.5%)</b>	<b>32 (40%)</b>
<b>Benign lesion</b>			
0 to 20 years	3 (3.75%)	0 (0%)	3 (3.75%)
21 to 40 years	2 (2.5%)	0 (0%)	2 (2.5%)
41 to 60 years	0 (0%)	0 (0%)	0 (0%)
>60 years	0 (0%)	0 (0%)	0 (0%)
<b>Total</b>	<b>5 (6.25%)</b>	<b>0 (0%)</b>	<b>5 (6.25%)</b>
<b>Malignancy</b>			
0 to 20 years	1 (1.25%)	1 (1.25%)	2 (2.5%)
21 to 40 years	4 (5.0%)	0 (0%)	4 (5.0%)

41 to 60 years	1 (1.25%)	2 (2.5%)	3 (3.75%)
>60 years	1 (1.25%)	3 (3.75%)	4 (5.0%)
<b>Total</b>	<b>7 (8.75%)</b>	<b>6(7.5%)</b>	<b>13(16.25%)</b>

In our study all 80 patients underwent radiological investigations. On the basis of radiology, out of 80 patients, 63(78.75%) patients were non-neoplastic, 4 (5.0%) patients were benign and 13 (16.25%) patients were malignant. Out of the 80 patients, in 79 (98.75%) patients radiological diagnosis correlated with the histopathological

diagnosis (table-4).1 (1.25%) case was atypically presented as ?polyp on radiological scan which was diagnosed as mucor mycosis on histopathological examination. The 7 (8.75%) malignant cases diagnosed as nasal mass with malignant aetiology on radiological investigation, were confirmed with histopathological examination.

**Table 4: Comparison of Histopathological and radiological diagnosis**

Radiological diagnosis	Number of cases	Histopathological diagnosis	Number of cases
<b>Non-Neoplastic</b>			
Nasal polyp	31 (38.75%)	Nasal polyp (Fig. 4)	30 (37.5%)
		Mucor mycosis (Fig. 1)	1 (1.25%)
Fungal infection	31 (38.75%)	Fungal infection	31 (38.75%)
Inflamed dentigerous cyst	1 (1.25%)	Inflamed dentigerous cyst	1 (1.25%)
<b>Neoplastic</b>			
<b>Benign</b>			
Pyogenic granuloma	2 (2.5%)	Pyogenic granuloma	2 (2.5%)
Angiofibroma	1 (1.25%)	Angiofibroma	1 (1.25%)
Ossifying fibroma	1 (1.25%)	Ossifying fibroma	1 (1.25%)
<b>Malignant</b>			
Nasopharyngeal carcinoma	3 (3.75%)	Nasopharyngeal carcinoma	3 (3.75%)
BCC	3 (3.75%)	BCC	3 (3.75%)
Nasal mass ?malignancy	7 (8.75%)	Spindle cell tumour	1 (1.25%)
		Round cell tumour (Fig. 2)	2 (2.5%)
		Adenoid cystic carcinoma (Fig. 3)	1 (1.25%)
		Poorly differentiated carcinoma more likely small round cell tumor	1 (1.25%)
		Poorly differentiated carcinoma	1 (1.25%)
		Possibility of high-grade malignancy	1 (1.25%)

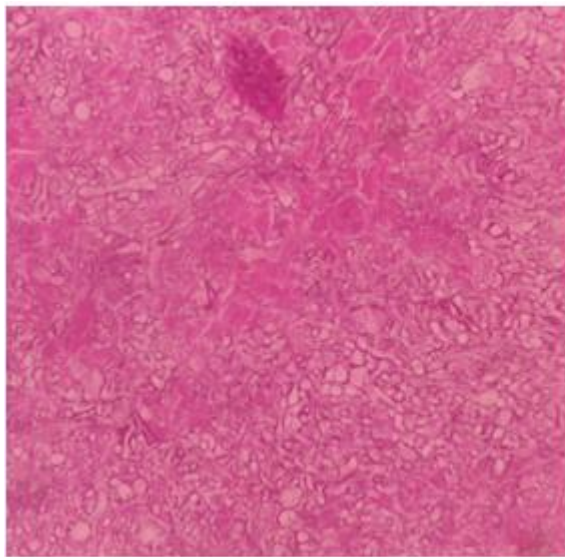


Fig.1: Mucor mycosis (H&E; 40X)

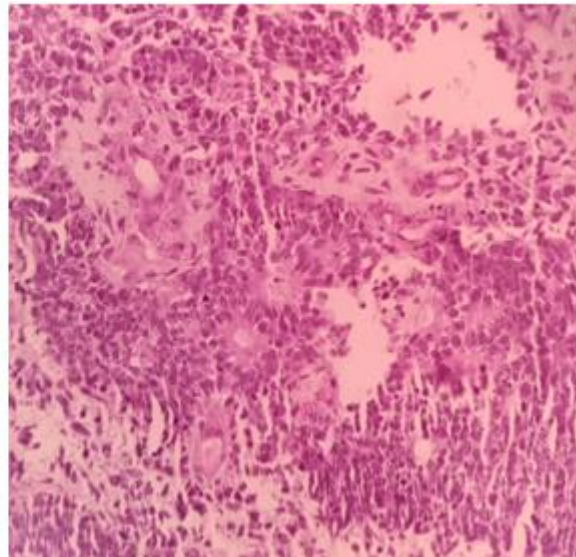


Fig.2: Small blue round cell tumor (H&E; 40X)

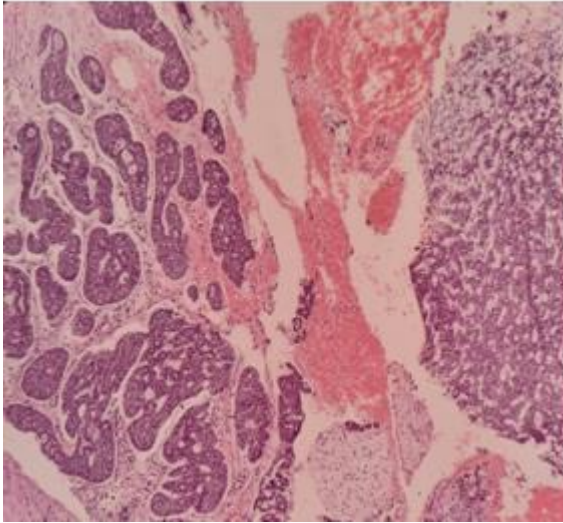


Fig.3: Adenoid cystic carcinoma (H&E;40X)

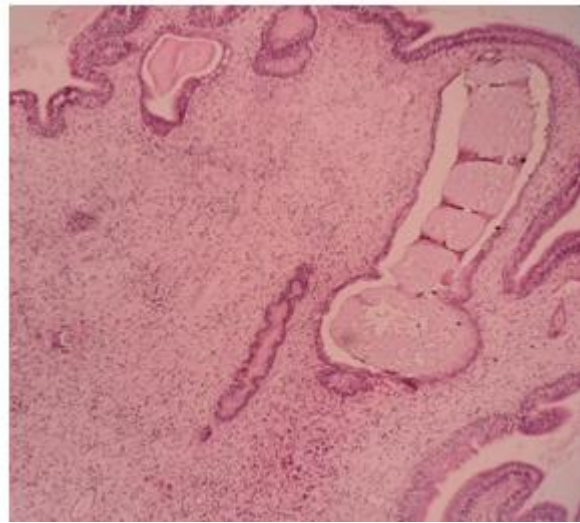


Fig.4: Inflammatory polyp (H&E; 40X)

### Discussion

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity (NC), paranasal sinuses (PNS) and these are very common lesions encountered in clinical practice. The presenting features and symptomatology and advanced imaging technique helps to draw a provisional diagnosis but histopathological examination remains the gold standard to illustrate definitive diagnosis[9].

The present study was conducted among 80 subjects who presented with sino-nasal and nasopharyngeal masses. This study comprised of 71.25% males and 28.75% females (male to female ratio was 2.47:1), hence indicating male dominance. Our results were similar to the study conducted by Bist et al who showed male to female ratio was 1.8:1.0[10]. Males are often exposed to dust, infection and smoking habits, and have more outdoor functioning as compared to females. The male dominance may indicate the genetic predisposition for developing various diseases in males or it could be a reflection of the male dominated society where the male members are exposed to varied environmental stress factors in the process of earning a livelihood for the family, or it could be due to an overall higher male attendance at hospitals[8].

In present study the majority of the cases were in the age group of 21–40 years (42.5%). The demographic distribution of the present was in concordance with the study done by Kanwar, et al[4]. Mean age of presentation in the present study was 43.39. That was in accordance with another Indian study done by S. S. Bist et al[10] which shows mean age of presentation was 39.4 years, whereas the mean age for non-neoplastic, benign, and malignant lesions was 39.1, 27.1, and 51 years, respectively. The study conducted by Khan N et al[11] also revealed similar mean age of presentation which was 22.5 years for non-neoplastic lesions, 26.8 years for benign lesions, and 35.3 years for malignant lesions. It was observed that in most of the studies that mean age was less for non-neoplastic lesions; it was increasing for benign lesions and was highest for malignant lesions[10].

In our study all 80 patients underwent radiological investigation. On the basis of radiology, out of 80 patients, 63 (78.75%) patients were non-neoplastic, 04 (5.0%) patients were benign and 13 (16.25%) patients were malignant. These results are similar with the study done by Vikas Dhillon et al[12].

In our study, 98.75 % of the cases correlated both radiologically and histologically. 1.25% cases diagnosed radiologically as polyp had a different histopathological diagnosis. Similar results were reported by Sahini et al[8]. and Karki et al in their study[13]. Comparisons of radiological and histopathological diagnosis were done among 81 non-neoplastic cases, out of which 90.13% were correlated and among neoplastic cases, 57.89% were correlated.

### Conclusions

It can be concluded from our study that histopathological examination is mandatory for confirmatory diagnosis of any masses present in nasal, paranasal sinus and nasopharynx. Radiological investigation always play important role as it helps pathologist as well as clinician about primary diagnosis of whether benign or malignant.

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