

Original Research Article

Clinico-pathological and radiological correlation of sino-nasal masses in a tertiary care center

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ABSTRACT

Background: The nasal masses are most commonly encountered condition in outpatient department of otorhinolaryngology. The purpose of this study was to show the clinical, radiological and histopathological correlation of sino nasal masses.

Methods: This study was conducted on 100 cases with sino nasal masses over a period of 2 years. A provisional diagnosis was made after clinical and radiological investigation which was confirmed with histopathological examination and the findings were correlated.

Results: The number of non-neoplastic lesions were more than neoplastic lesions (75% vs 25%). Incidence was highest in the age group of 31-40 year (21%) with male to female ratio of 1.5:1. In our study among non-neoplastic lesion, inflammatory lesion had highest frequency (75%). We found clinical and histopathological correlation in 94.6% cases (p value 0.04). 93.33% cases correlated radiologically and histopathologically (p value 0.04).

Conclusions: We concluded that for proper evaluation of sino nasal masses, clinical, radiological, histopathological evaluation should be carried out conjointly. Histopathologic evaluation remains the gold standard.

Keywords: Sino nasal mass, Neoplastic, Non-neoplastic, Histopathological, Polyp

INTRODUCTION

The nose is the prominent part of the face with substantial aesthetic and functional significance. The sino nasal cavities occupy a relatively small anatomical space, however it can be the site of origin for one of the most histologically diverse group of tumours.¹ 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.² Various pathologies ranging from non-neoplastic lesion to malignant tumor may present as simple nasal mass. It is not possible to determine clinically what pathology lies underneath. 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.³

Having an uncertain etiology and tendency to recur, they represent a challenging diagnosis for the physician to treat.⁴ Histopathological evaluation (HPE) remains the gold standard of investigation. It provides the actual diagnosis of variant conditions labelled as sino nasal

masses.² In all instances, histopathological analysis of the infected tissue should be done through biopsy or surgically excised specimen.⁵ Hence the present study was conducted with the aim to find out the correlation of the clinical and radiological findings with the histopathology.

METHODS

The present study was conducted in department of ENT in Government Medical College and Rajindra Hospital, Patiala to evaluate clinicopathological features and radiological findings of sino nasal masses. The study protocol was approved by the Institutional Review Board for Ethical Clearance of Government Medical College and Rajindra Hospital and it was performed in accordance with the code of ethics of the World Medical Association according to the declaration of Helsinki of 1975, as revised in 2000.

The present prospective observational study was conducted on 100 patients of any age and sex presenting to otorhinolaryngology outpatient clinics of Government Medical College Patiala with complaints of nasal obstruction, nasal discharge or nasal bleed. Detailed clinical history was taken with reference to age, sex, residence, occupation, family history, past history, any allergic disorder, any addictive habits. Detailed clinical ear, nose and throat examination and general examinations were done. Patient were subjected to diagnostic nasal endoscopy with 0-degree endoscope after nasal packing. Patient found to have masses in nasal cavity (discovered on examination or nasal endoscopy) were subjected to undergo radiological investigation non contrast computed tomography nose and paranasal sinuses coronal and axial views, slice thickness 0.5 mm. On the basis of clinical examination and radiological evaluation, a provisional diagnosis was hypothesized. All patients underwent preoperative paranasal sinus CT Scan in coronal plane and CT images were adapted to Lund Mackay scores. These patients of sino nasal masses (on radiology and endoscopy) were kept for biopsy under general anaesthesia in ENT operation theatre after relevant blood investigations and anaesthesia clearance. biopsy of nasal mass was taken and sent for histopathological examination to pathology Department of Government Medical College Patiala.

Diagnosis was confirmed by histopathological evaluation and correlated with the clinical hypothesis. Histopathological review was performed to assess the presence of mucosal inflammation including cellular epithelial markers. The exact number of eosinophils, neutrophils, lymphocytes, mast cells, plasma cells and macrophages were evaluated as cellular markers. The presence of squamous metaplasia and goblet cells was evaluated as epithelial markers. The epithelial lining was checked for the presence of squamous metaplasia. The results were analysed statistically. The mean and standard deviation of the measurements as per group were used for

statistical analysis (SPSS 22.00 for windows; SPSS Inc, Chicago, USA). Difference between two groups was determined using chi square test and the level of significance was set at $p < 0.05$. Patient without histopathological result, patient with recurrence previously treated for sino nasal masses during this study period and patient not consenting for study were excluded.

RESULTS

This study comprised of 60% males 40% females, hence indicating male dominance (Figure 1). The maximum subjects were in the age group of 31-40 years (21%) followed by 11-20 years (20%) and 21-30 years (19%). The minimum subjects were in the age group of 51-60 years (4%) followed by <10 year (10%) and >60 years (12%) as shown in (Figure 2). Mean age in the present study was 32.67 years. Male to female was 1.5:1. Majority of patients belonged to lower socioeconomic class.

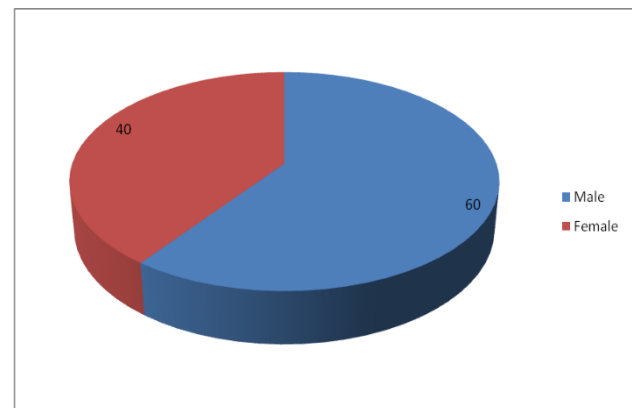


Figure 1: Gender distribution of the study subjects.

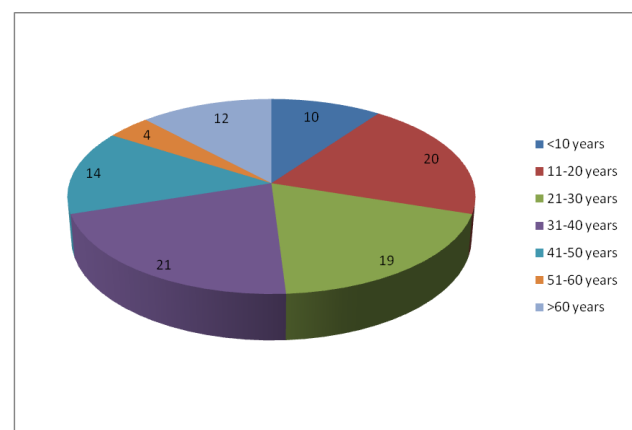


Figure 2: Age distribution of the study subjects.

Maximum number of patients were students (41%) followed by labourer (37%) and farmer (16%). Out of 100 cases, 75 were non-neoplastic lesions. On clinical examination, 21 were antro-choanal polyp, 50 were ethmoidal polyps and 4 cases were of fungal polyposis.

All of them were labelled as inflammatory polyp on histopathological examination (Table 1). In neoplastic lesions, 20 out of 25 were considered benign on clinical suspicion which was positively confirmed on histological examination. Malignant pathology was suspected in 5 cases, out of which only 3 turned out to be squamous cell carcinoma while remaining 2 were labelled as inflammatory (Table 2).

On radiological evaluation out of 75 non-neoplastic cases 20 had AC polyp, 46 cases had ethmoidal polyp, fungal polyposis was suspected in 5 cases and maxillary polyp in 4 cases whereas on histological examination all 75 cases were labelled as inflammatory in origin (Table 3). In neoplastic lesion 20 cases were benign radiologically which includes angiofibroma in 11 cases, 1 case of hemangioma, inverted papilloma in 8 cases which was confirmed on histological examination.

Table 1: Comparison of clinical and histopathological diagnosis (n=75).

Non-neoplastic			
Clinical diagnosis	No. of patients	Histopathological diagnosis	No. of patients
AC polyp	21	Inflammatory Polyp	21
Ethmoidal polyp	50	Inflammatory Polyp	50
Fungal polyposis	4	Inflammatory Polyp	4
Chi-square	5.19		
P value	0.04*		

Table 2: Comparison of clinical and histopathological diagnosis (n=25).

Neoplastic			
Benign			
Clinical diagnosis	No. of patients	Histopathological diagnosis	No. of patients
Angiofibroma	11	Angiofibroma	10
Hemangioma	1	Hemangioma	1
Inverted papilloma	8	Inverted Papilloma	2
		Inflammatory Polyp	9
Malignant			
Squamous cell carcinoma	5	Squamous cell carcinoma	3
Chi-square	2.63		
P value	0.37		

*Statistically significant.

Out of 8 cases of suspected inverted papilloma radiologically only 2 proved histologically whereas rest

were inflammatory in origin. Malignant pathology was suspected in 5 cases out of which 3 turned out to be squamous cell carcinoma (Table 4).

Table 3: Comparison of radiological and histopathological diagnosis (n=75).

Non-neoplastic			
Radiological diagnosis	No. of patients	Histopathological diagnosis	No. of patients
AC polyp	20	Inflammatory polyp	20
Ethmoidal polyp	46	Inflammatory polyp	46
Fungal polyposis	5	Inflammatory polyp	5
Maxillary polyp	4	Inflammatory polyp	4
Chi-square	5.38		
P value	0.04*		

Table 4: Comparison of radiological and histopathological diagnosis (n=25).

Neoplastic			
Benign			
Radiological diagnosis	No. of patients	Histopathological diagnosis	No. of patients
Angiofibroma	11	Angiofibroma	10
Hemangioma	1	Hemangioma	1
Inverted papilloma	8	Inverted papilloma	2
		Inflammatory polyp	9
Malignant			
Squamous cell carcinoma	5	Squamous cell carcinoma	3
Chi-square	2.63		
P value	0.37		

*Statistically significant.

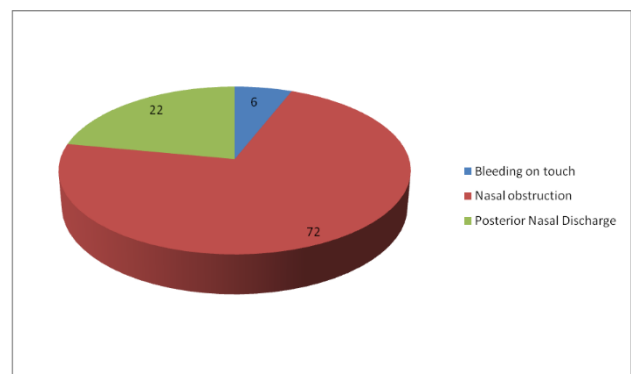


Figure 3: Symptoms among the study subjects.

DISCUSSION

Prolonged irritant exposure like dust inhalation, smoking, nickel, radium, isopropyl alcohol, toxic gases such as the mustard gas constitutes the etiology of the nasal cavity tumors. Throughout life, radiation exposure (diagnostic or therapeutic), immunosuppression or lesions that carry the risk for malignant degeneration such as the inverted papilloma increases the frequency of the malignant lesions.^{6,7} The incidence of cancer of nasal cavity and paranasal sinuses is low in most of the population. Although higher incidence is seen in Japan and certain parts of China and India.^{8,9} Malignant lesions in the nasal cavity are uncommon, but the related clinical characteristics of the benign and malignant lesions delay the diagnosis.¹⁰ A large number of pathological disorders originate from the sino nasal region, both non-neoplastic and neoplastic, and are often observed in day-to-day clinical practice. A detailed history in combination with modern imaging techniques, help to establish a presumed diagnosis.¹⁰ The clinical symptoms and symptomatology and modern MRI technology help to make a preliminary conclusion, but histopathological testing remains the gold standard for definitive diagnosis.

The present study was conducted among 100 subjects who presented with sino nasal masses. This study comprised of 60% males 40% females (male to female ratio was 1.5:1), hence indicating male dominance. Our results were similar to the study conducted by Bist et al who showed male to female ratio was 1.8:1.0.¹¹ The study conducted by Sharma et al also found similar results with male to female ratio of 1.38:1.¹² Another study done by Lathi et al showed similar findings with male to female ratio of 1.5:1.¹³ 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.

In our study, maximum subjects were in the age group of 31-40 years (21%) followed by 11-20 years (20%) and 21-30 years (19%). Mean age of presentation in the present study was 32.67 years. A study done by Sharma et al¹⁴ found similar results which shows 30% of the cases in the age group of 21-30 years. That was in accordance with another Indian study done by S. S. Bist et al¹¹ 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 al¹⁵ 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.¹¹

In our study nasal obstruction was the most common symptom in patients with sino nasal masses (72%) followed by posterior nasal discharge (22%). On diagnostic nasal endoscopy bilateral nasal mass, unilateral mass, deviated nasal septum, turbinate hypertrophy and bleeding on touch was revealed among 31.0%, 28%, 20%, 15% and 6.0% of the subjects respectively. This was similar to the findings reported by Maheshwari et al in which nasal obstruction was the most common presenting problem (71 cases, 88.75%) followed by nasal discharge (58 cases, 72.5%).¹⁰ Another study done by Dhillon et al assessed that 90% of cases presented with complain of nasal obstruction.¹⁶ 60% patient gave history of nasal bleed. The high number of cases with nasal bleed was due to higher number (30%) of cases of angio-fibromas invariably presenting with episodes of minor to significant nasal bleed. Similar findings were reported by Bist et al who revealed that nasal obstruction was found in 87.27% cases followed by nasal discharge (69.09%) and headache (60.90%).¹¹

In the present study, histopathological diagnosis revealed inflammatory polyp in case of non-neoplastic cases while clinical diagnosis reported AC polyp, ethmoidal polyp and fungal polyposis among the study subjects. Histopathological diagnosis found squamous cell carcinoma in 3% of the subjects whereas clinical diagnosis reported the same among 5% of the subjects in the present study. In the present study, 94.67% of the cases correlated both clinically and histopathologically (p value 0.04). 5.33% cases were diagnosed as fungal polyposis with a different histopathological diagnosis. Among 25 neoplastic nasal masses, 56% had correlation between clinically and histopathological diagnosis whereas 44% were not correlated. Similar results were reported by Karki R et al¹⁷ in their study who found that out of 80% patients clinically diagnosed as non-neoplastic masses, 90% cases correlated both clinically and histopathologically (p value 0.008) and 10% of clinically diagnosed fungal polyposis turned to be inflammatory polyp on histopathological examination. Among 20 neoplastic nasal masses, 60% had correlation between clinically and histopathological diagnosis whereas 40% were not correlated. Another study done by Gupta et al showed that clinical-histopathological correlation was 96% which is approximately similar to the study done by Kale et al who found clinical histopathological correlation in 99.7% cases.¹⁸⁻¹⁹ Diamantopoulus et al found clinico-histopathological correlation in 98.9% cases among 2021 patients.²⁰

In the present study, 93.33% of the cases correlated both radiologically and histopathologically (p value 0.04). 6.67% the cases diagnosed fungal polyposis had a different histopathological diagnosis. Among 25 neoplastic nasal masses, 56% had correlation between

radiologically and histopathological diagnosis whereas 44% were not correlated (p value 0.37).

Similar results were reported by 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 (p value 0.008).

CONCLUSION

It can be concluded from the results of present study that major lesions can be missed on clinical or radiological examination and for accurate diagnosis and treatment, a detailed histopathological examination should be carried out in all cases of sino nasal masses. For cases with sino nasal volumes, radiology appears to be invaluable as it provides the endoscopic surgeon with a road map and alerts of any possible or potential complications. All these modalities are complementary to each other but histopathological examination remains the gold standard for diagnosis.

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REFERENCES

1. Llorente JL, Lopez F, Suarez C, Hermsen MA. Sinonasal carcinoma: clinical, pathological, genetic and therapeutic advances. *Nature Rev Clin Oncol*. 2014;11(8):460.
2. Das S, Kirsch CF. Imaging of lumps and bumps in the nose: A review of sino nasal tumours. *Cancer Imaging*. 2005;5:167-77.
3. Thompson LD. Sino nasal carcinomas. *Current Diagnostic Pathology*. 2006;12(1):40-53.
4. Newton JR, See AKW. A review of nasal polyposis. *Therapeutics Clin Risk Management*. 2008;4(2):507-12.
5. Sharma A, Garg LN, Baisakhiya N. Clinico-pathological and radiological assessment of benign nasal masses. *Int J Otorhinolaryngol Head Neck Surg*. 2017;3:1087-94.
6. Carrau RL, Myers EM, Johnson JT. Paranasal sinus carcinoma: diagnosis, treatment and prognosis. *Oncology (Williston Park, NY)*. 1992;6(1):43-50.
7. Spiro JD, Soo KC, Spiro RH. Non-squamous cell malignant neoplasms ODF the nasal cavities and paranasal sinuses. *Head Neck*. 1995;17(2):114-8.
8. Turner JH, Reh DD. Incidence and survival in patients with sino nasal cancer: a historical analysis of population-based data. *Head Neck*. 2012;34(6):877-85.
9. Boffetta P, Boccia S, Vecchia LC. A quick guide to cancer epidemiology; *Epidemiology, Biostatistics and Public Health*. Overview Major Causes Human Cancer. 2014;11(1):77-88.
10. Maheshwari A, Bansal A. Clinico-pathological spectrum of sino nasal masses: a tertiary care hospital experience. *Int J Otorhinolaryngol Head Neck Surg*. 2017;3(4):1015.
11. Bist SS, Varshney S, Baunthiyal V, Bhagat S, Kusum A. Clinico-pathological profile of sino nasal masses: an experience in tertiary care hospital of Uttarakhand. *Natl J Maxillofac Surg*. 2012;3:180-6.
12. Sharma R, Sahni D, Uppal K, Gupta R, Singla G. A clinicopathological study of masses of nasal cavity paranasal sinuses and nasopharynx. *Int J Otorhinolaryngol Head Neck Surg*. 2017;3(2):253.
13. Lathi A, Syed MM, Kalakoti P, Qutub D, Kishve SP. Clinico-pathological profile of sino nasal masses: a study from a tertiary care hospital of India. *ACTA Otorhinolaryngologicaitalica*. 2011;31(6):372.
14. Sharma A, Garg LN, Baisakhiya N. Clinico-pathological and radiological assessment of benign nasal masses. *Int J Otorhinolaryngol Head Neck Surg*. 2017;3:1087-94.
15. Khan N, Zafar U, Afroz N, Ahmad SS, Hasan SA. Masses of nasal cavity, paranasal sinuses and nasopharynx: a clinicopathological study. *Indian J Otolaryngol Head Neck Surg*. 2006;58:259-63.
16. Dhillon V, Dhingra R, Davessar JL, Chaudhary A, Monga S, Kaur M, et al. Correlation of clinical, radiological and histopathological diagnosis among patients with sino nasal masses. *Int J Contemporary Med Res*. 2016;3(6):1612-5.
17. Karki R, Pradhan B, Thapa N, Jha A. Correlation of clinical and radiological with post-operative histopathological diagnosis of nasal masses. *Nepalese J ENT Head Neck Surg*. 2012;3(1):5-6.
18. Gupta R, Moupachi SS, Poorey VK. Sino nasal masses: a retrospective analysis. *Indian J Otolaryngol Head Neck Surg*. 2013;65(1):52-6.
19. Kale SU, Mohite U, Rowlands D, Lee DAB. Clinical and histopathological correlation of nasal polyps; Are there any surprises. *Clin Otolaryngol Allied Sci*. 2001;26:321-3.
20. Diamantopoulos II, Jones NS, Lowe J. All nasal polyps need histological examination: An audit-based appraisal of clinical practice. *J Laryngol Otol*. 2000;114:755-9.

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