

Original Research Article

Evaluation of clinical, radiological and pathological correlation of sino-nasal masses: our experience

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ABSTRACT

Background: Purpose of study was to evaluate clinical, radiological, pathological correlation of sinonasal masses, to correlate age and sex with etiology of sinonasal masses and to evaluate percentage of patient having malignancy.

Methods: This was a hospital based prospective observational study. In this study total numbers of 69 cases of sinonasal mass were selected from those patients who were admitted in department of otorhinolaryngology and head and neck surgery SAMC and PGI Indore MP from June 2019 to August 2021.

Results: Sinonasal masses are more common in 4th to 6th decade, males, farmers and lower socioeconomic status. Most common presented symptom with sinonasal mass was nasal obstruction. Patients shows polypoidal mass in nasal endoscopy, which was most common finding. Most of the patients radiological scan shows the opacity. 26.1% cases were neoplastic and rest non neoplastic. These rules however, may be broken in sinonasal imaging. The relative number of non-neoplastic and neoplastic lesions varies from region to region. A provisional diagnosis was made after clinical assessment and radiological investigation but final diagnosis was made after histopathological examination.

Conclusions: From the above study, it is clear that radiological examination and nasal endoscopy is helpful and important adjunct to overall clinicopathological evaluation of patients but it is not free of fallacies. Hence a thorough radiological, clinicopathological evaluation with pre op endoscopic evaluation and histopathology is necessary for better management of patients presenting with sinonasal masses.

Keywords: Sinonasal mass, Nasal obstruction, Neoplastic, Non neoplastic, Polyp

INTRODUCTION

The nose is the prominent part of the face with substantial aesthetic and functional significance.¹ A provisional diagnosis was made after clinical assessment and radiological investigation but final diagnosis was made after histopathological examination.²

The sinonasal 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.³ Sinonasal masses can develop as a result of a variety of disorders affecting the paranasal sinuses, as well as diseases of the nose and nasopharynx. In otorhinolaryngology, a mass in the nasal cavity is a

common symptom. A mass can be caused by a number of different pathologies. Clinical evaluation, radiological findings, and histopathological reports are used to clinically differentiate the various conditions presenting as sinonasal masses in order to understand their exact nature. Classically benign neoplasm expands and remodel bone and aggressive malignancies destroy and invade adjacent tissue with illdefined margin.¹ There are various differential diagnosis for a sinonasal mass. There could be congenital, inflammatory, allergic, neoplastic (benign or malignant), fungal etiologies. Midline swelling is common in congenital tumours such as dermoid cysts, gliomas, and encephaloceles. Allergic, inflammatory, or fungal polyps are non-neoplastic tumours. Haemangioma, angiofibroma, mucocele, and inverted papilloma are all

benign tumours. Angiofibroma is benign but a biologically aggressive tumor in adolescent males. Haemangioma found anywhere in nasal cavity, but commonly found on the anterior part of nasal septum, where they are called the bleeding polyp of septum.

From the oropharynx or nasopharynx, malignant tumours may originate or expand into the nose and paranasal sinuses. Sinonasal masses can potentially be a sign of certain haematological cancers.

Benign tumors are not uncommon but malignant tumors are rare constituting less than 1% of all malignancy (3% of all head and neck tumor). Primary neurogenic tumour that involves nose and paranasal sinuses comparatively rare. Tumours of schwann cell origin, neurofibroma and neurilemoma occurs in nasal fossa very rarely.

The sinonasal malignancy may be found to be arising from the tissues and structures of the nasal cavity and paranasal sinuses. Even pathologies, which are arising from cranial cavity, may also appear as mass in the nasal cavity or paranasal sinuses. The presentation of sinonasal malignancy depends on the primary site, the direction and extent of spread. The most common initial symptoms are nasal obstruction, epistaxis, proptosis, epiphora, diplopia, loose teeth, facial pain and swelling, buccal or palatal swelling. The most frequent malignant tumour of the sinonasal cavity is squamous cell carcinoma (SCCA).⁴ Males are more likely to experience them.⁵ Sinonasal cavity SCCA is most common in nickel workers.⁶ They manifest as a nasal mass, similar to other nasal cancers, with symptoms of obstruction, discharge, bleeding, and facial enlargement.⁷ Prognostic markers for a large sample of carcinoma patients comprised histological differentiation, tumour site, tumour stage, nodal involvement, and therapy strategy.⁸ Determination of the underlying pathology clinically is not possible clinically. As a result, a nasal endoscopy is recommended. To arrive at a diagnosis, we use both radiological findings and histology together. The final diagnosis of various disorders presenting as sinonasal masses or pathologies is determined by histological investigation of the excised tissue.⁹

METHODS

This was a prospective observational study conducted in department of otorhinolaryngology and head and neck surgery SAMC and PGI Indore MP from June 2019 to august 2021. This study included 69 cases of sinonasal pathology after taking written informed consent from patient. All patients had undergone detailed history and ENT examination followed by nasal endoscopy and radiological imaging studies [CT/MRI].

Inclusion criteria

Includes patients with sinonasal mass diagnosed on ENT examination, nasal endoscopy and radiological study.

Exclusion criteria

Patients with acute bacterial rhinosinusitis, patient not giving consent to participate in study, patients with maxillofacial trauma, uncooperative patients, patients not fit for surgery were excluded.

Patients who enrolled in study underwent systematic sampling with complete ENT history and examination followed by nasal endoscopy and radiological imaging studies. Further patient underwent endoscopic biopsy in GA and further surgical and medical management was planned on the basis of histopathological finding. A detailed history in combination with modern imaging techniques, help to establish a presumed diagnosis.¹⁰

Data were entered in Microsoft and analysed using SPSS software. We calculated mean and standard deviation for linear variable and proportions for categorical variable.

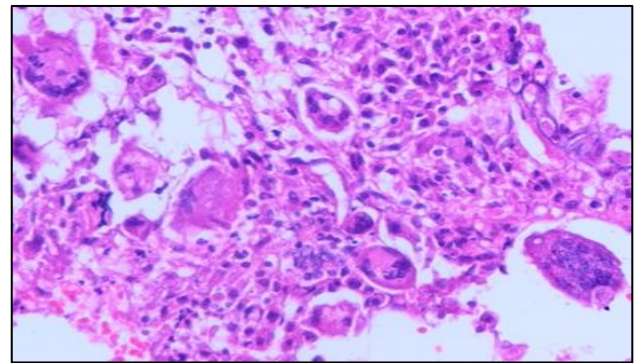


Figure 1: Giant cell granuloma.

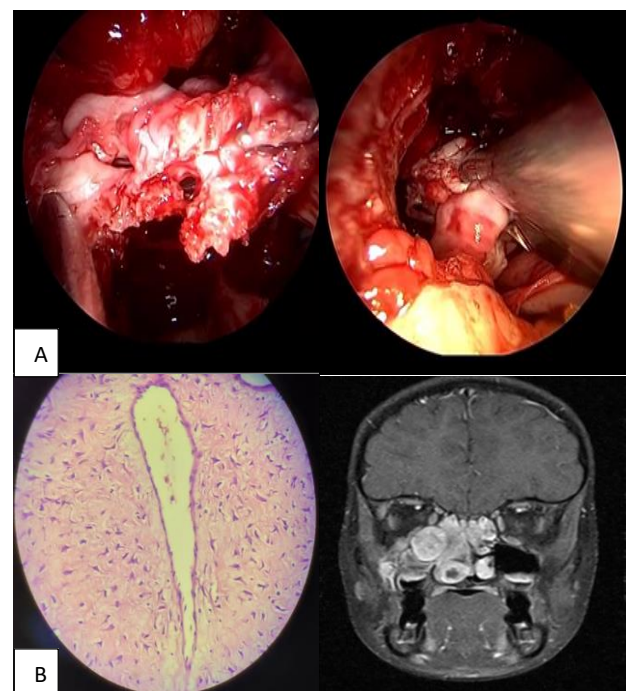


Figure 2 (A and B): Endoscopic images of JNA and HPE and MRI with contrast.

RESULTS

The above tables shows that majority of the maximum patients belongs to 41 to 60 years age group 28 (40.6%), The second most of the patients belongs to 21-to-40-year age group 21 patients (30.4%). That denote the sinonasal masse are more common in 4th to 6th decade. The majority of the cases fond in male sex 49 (71%) That denotes the sinonasal masses are more common in males. The most of the sinonasal masses are presented with the nasal obstruction 65 cases (94.2%), other most common presenting symptoms are headache in 48 cases (69%), facial pain 47 cases (68.1%), facial swelling 37 cases (53.6%), reduced vision 25 cases (36.2%), epistaxis in 16 cases (23.2%). The most of the sinonasal Masses presented in bilateral site of the sinonasal region rather the unilateral. The most of the patients of Masses of the sinonasal region are diabetic and most of the patients diagnosed as nasal polyp and second most common was bleeding polyp.

Table 1: Correlation with age.

Age group (Years)	Frequency	Percentage (%)
1-20	6	8.7
21-40	21	30.4
41-60	28	40.6
61-80	14	20.3

Table 2: Correlation with sex.

Sex	Frequency	Percentage (%)
F	20	29
M	49	71

Table 3: Correlation with clinical variables.

Clinical variables	Category	Frequency, (n=69)	Percentage (%)
Nasal obstruction	A	4	5.8
	P	65	94.2
Cheek/facial swelling	A	32	35.4
	P	37	62
Epistaxis	A	53	76.8
	P	16	23.2
Facial pain	A	22	31.9
	P	47	68.1
Vision	Abn	25	36.2
	N	44	63.8
Proptosis	A	48	69.6
	P	21	30.4
Headache	A	21	30.4
	P	48	69.6
Palate involvement	A	56	81.2
	P	13	18.8
Restricted eye movement	A	49	71
	P	20	29

Table 4: Correlation with side of nasal cavity.

Sino-nasal mass	Frequency	Percentage (%)
Bilateral	29	42
Left nasal mass	20	29
Right nasal mass	20	29

Table 5: Correlation with comorbidities.

Significant past h/o	Frequency	Percentage (%)
No association	33	47.8
DM	26	37.6
DM, HTN	6	8.7
DM, HTN, CKD	4	5.8

Table 6: Correlation with radiological extent.

Radiology	Frequency	Percentage (%)
Bony erosion	38	55
Sinus extension		
Maxillary	54	78
Ethmoid	18	26
Frontal	8	12
Sphenoid	5	7
Infra temporal fossa	3	4
Pterygopalatine fossa	2	2
Intracranial extension	4	5

Table 7: Correlation with post op diagnosis.

Post op	Frequency	Percentage (%)
Adenoid cystic CA	2	2.89
Angiofibroma	4	5.79
Nasal polyp	25	36.2
Bleeding polyp	8	11.59
Central giant cell granuloma	2	2.89
Schwannoma	2	2.89
Dermoid cyst	2	2.89
Fibrous dysplasia	1	1.4
Inverted papilloma	7	10.14
Non-Hodgkins lymphoma	3	4.3
Moderately differentiated SCC	5	7.2
Undifferentiated nasopharyngeal carcinoma	6	8.6
Well differentiated SCC	2	2.89

DISCUSSION

Out of 69 patients the peak age of developing sinonasal masses was between 41 to 60 years consisting of 40% of total cases. According to Deepti et al and Scott Brown the highest incidence of malignancy occurs in 6th to 7th decade of life.^{11,12}

Sino nasal diseases are seen more commonly in males 71% out of which 22% were found to be malignant and 77% non-malignant. There is a statistically significant association between age and malignant character of Sinonasal masses thus etiology of sinonasal Masses shows gender predilection. An inverted papilloma is usually diagnosed following biopsy or excision since the early clinical course and gross appearance are customarily benign.¹³

According to Scott Brown the highest incidence of sinonasal malignancy and JNA found in males.¹²

In this study the majority of the patients were farmers 28% (19 out of 69) followed by laborers 20% (14 out of 69). As per Scott Brown 40% sinonasal masses associated with wood dust 39% showed involvement of bilateral sinonasal region, while involvement of the right and left sinonasal regions were found to be similar=30%. According to Lathi et al unilateral nasal masses were observed in 47.7% patients, while the remaining patients had bilateral nasal Masses.¹⁴

In our study, out of 69, 94% patient with sino nasal Masses had complaint of nasal obstruction out of which 23% patients presented with nasal obstruction had malignancy while 77% were non-malignant. A study on SCC by Sudheer et al showed that, in their study nasal obstruction was present in 68% of the patients.¹⁵ Malignant lesions in the nasal cavity are uncommon, but the related clinical characteristics of the benign and malignant lesions delay the diagnosis.¹⁶

As per our study 62% patients presented with the complaint of cheek swelling. Out of these 28% cases were malignant and 72% patient were non-malignant. According to Lathi et al swelling was seen in 11.6% of the patients.¹⁴

The 47% of the total masses presented within a duration of 1 month of start of symptoms. 8% patients had insidious onset and 32% patient had sudden onset of symptom. In the present study, out of the 69 cases in 34% polypoidal mass, 8.7% bleeding mass, 21% smooth, 12% reddish mass seen on nasal endoscopy.

Sino nasal opacity present in 99 % cases of sinonasal Masses 68 cases out of 69 cases. Orbital extension in 21 cases (31%) and intracranial extension in 20 cases (29%). Of all sinonasal Masses. Sino nasal imaging is computed tomography, which is supplemented by magnetic resonance imaging (MRI), which is superior in evaluating intraorbital and intracranial extensions.¹⁷ According to TORC CA 2021 37% cases involve the orbit and brain.¹⁸

CONCLUSION

A complete histological examination should be performed in all patients of sino nasal masses for an accurate diagnosis and course of therapy, it can be

inferred from the findings of the current study. Major lesions can be missed on clinical or radiographic examination. Radiology seems to be quite helpful in cases involving sino nasal volumes since it gives the endoscopic surgeon a road map and warns them of any probable or likely difficulties. They are a difficult diagnosis for the doctor to treat because of their ambiguous aetiology and propensity to reoccur. While each of these techniques has advantages over the others, histopathological analysis is still the most reliable method for making a diagnosis.

The study would be more conclusive if there might be no limitation by less sample size due to covid scenario and mucormycosis.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Das S, Kirsch CF. Imaging of lumps and bumps in the nose: a review of sinonasal tumours. *Cancer Imaging.* 2005;5(1):167-77.
2. 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(3):259-63.
3. Llorente JL, Lopez F, Suarez C, Hermsen MA. Sinonasal carcinoma: clinical, pathological, genetic and therapeutic advances. *Nature Rev Clin Oncol.* 2014;11(8):460.
4. Grau C, Jakobsen MH, Harbo G. Sino-nasal cancer in Denmark 1982-1991-a nationwide survey. *Acta Oncol.* 2001;40:19-23
5. Hone SW, O'Leary TG, Maguire A, Burns H, Timon CI. Malignant sinonasal tumours: the Dublin Eye and Ear Hospital experience. *Ir J Med Sci.* 1995;164:139-41.
6. Barton RT. Nickel carcinogenesis of the respiratory tract. *J Otol.* 1977;6:412-22.
7. Porceddu S, Martin J, Shanker G. Paranasal sinus tumors: Peter MacCallum Cancer Institute experience. *Head Neck.* 2004;26:322-30.
8. Harbo G, Grau C, Bundgaard T, Overgaard M, Elbrønd O, Sjøgaard H et al. Cancer of the Nasal Cavity and Paranasal Sinuses. *Acta Oncologica.* 1997;36(1):45-50.
9. Chopra H, Dua K, Chopra N, Mittal V. Histopathology of Nasal Masses. *Clin Rhinol.* 2010;3(2):81-5.
10. Maheshwari A, Bansal A. Clinico pathological spectrum of sinonasal masses: a tertiary care hospital experience. *Int J Otorhinolaryngol Head Neck Surg.* 2017;3(4):1015.
11. Deepthi S, Pratibha CB, Balasubramanya AM. Unilateral maxillary swelling. *Int J Otorhinolaryngol Head Neck Surg.* 2019;5(1):120-6.

12. Stern SJ, Goepfert H, Clayman G, Byers R, Ang KK, el-Naggar AK, et al. Squamous cell carcinoma of the maxillary sinus. *Arch Otolaryngol Head Neck Surg.* 1993;119(9):964-9.
13. Mainzer F, Stargardter FL, Connolly ES. Inverting Papilloma of the Nose and Paranasal Sinuses. *Radiology.* 1969;92.
14. Lathi A, Syed MMA, Kalakoti P, Qutub D, Kishve SP. Clinico-pathological profile of sinonasal masses: a study from a tertiary care hospital of India. *Acta Otorhinolaryngol Italica Head and Neck Surg.* 2011;31(6):372-7.
15. Sudheer CP, Singh TD. Squamous cell carcinoma of maxillary sinus. *Int J Otorhinolaryngol Head Neck Surg.* 2018;4(5):1229-32.
16. Fagin JA, Matsuo K, Koeffler HP. High prevalence of mutations of the p53 gene in poorly differentiated human thyroid carcinomas. *J Clin Invest.* 1993;91(1):179-84.
17. Higuera JG, Mullins CB, Duran LR, Sandoval H, Akle N, Figueroa R. Sinonasal Fungal Infections and Complications. *J Clin Imaging Sci.* 2016;6:23.
18. Bist SS, Varshney S, Baunthiyal V, Bhagat S, Kusum A. Clinico-pathological profile of sinonasal masses: an experience in tertiary care hospital of Uttarakhand. *Natl Maxillofac Surg.* 2012;3:180-6.

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