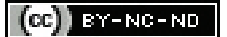


Aetiopathological Spectrum of Unilateral Nasal Mass: A Hospital-based Cross-sectional Study

S PRATHIBHA¹, AJAY KUMAR NEELI², SB AMARNATH³, MAHESH KUMAR REVOORI⁴

ABSTRACT

Introduction: The presence of unilateral symptoms or pathology should be regarded with extreme caution as sinonasal neoplasms in their early stages with subtle symptoms may mimic inflammatory pathology. It is always the otolaryngologist's endeavour to diagnose a neoplastic pathology in the early stage to prevent further complications.

Aim: To study the aetiopathological profile, age, and sex distribution of unilateral nasal masses presented at a tertiary care centre, Telangana, India.

Materials and Methods: The present study was a hospital-based cross-sectional study consisting of 53 patients of all age groups, of both sexes, with unilateral nasal mass presenting to the Ear, Nose and Throat (ENT) Outpatient Department (OPD) at Krishna Institute of Medical Sciences, Secunderabad, Telangana, India from December 2020 to June 2021. A detailed history was recorded and the patient underwent a complete ENT check-up,

and head-neck examination followed by Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and biopsy.

Results: The mean age of the study population was 44 years and there were 47 males and six females. Nose block was the most common presenting symptom in 43 (81.1%). Middle meatus was the common site seen in 12 patients (22.6%). Inflammatory lesions was the most common observed in 24 (45.3%), followed by fungal sinusitis in 6 (11.3%), granulomatous lesions in 2 (3.8%), benign lesions in 15 (28.3%), and malignant lesions in 6 (11.3%).

Conclusion: Unilateral nasal masses were found common in males than females, with a peak incidence in the 5th to 6th decades of life. Histopathologically inflammatory lesions are the most common followed by benign and then malignant lesions. Any unilateral nasal mass should be viewed with a high index of suspicion for malignant lesions and should be subjected to diagnostic nasal endoscopy, imaging, and histopathological examination after surgical excision of the mass.

Keywords: Inflammatory lesions, Malignancy, Nasal obstruction

INTRODUCTION

Patients with nasal masses may present with rhinorrhoea and nasal obstruction. Unilateral persistent nasal obstruction may indicate the presence of an inflammatory or neoplastic lesion [1,2]. It is always the otolaryngologist's endeavour to diagnose a neoplastic pathology in the early stage to prevent further complications. Most of the time, sinonasal neoplasms are present in an advanced stage because they do not cause early symptoms [3,4]. Most of the sinonasal masses have similar presenting features and symptomatology including nasal obstruction, rhinorrhoea, blood-stained nasal discharge, epistaxis, oral symptoms, facial swelling, orbital and ear symptoms [5-7].

Sinonasal masses have been instituted principally in the second to fourth decades of life [8,9], however, malignant tumours have been mostly reported after the fourth decade [10,11]. Nasal polyps were the most common lesions with benign sinonasal masses observed [12,13]. Simple nasal polyps are round, smooth, soft, translucent, yellow, or pale glistening structures attached to the nasal or sinus mucosa by a relatively narrow stalk or pedicle. These are non tender and displaced backward on probing. These features clinically distinguish them from the turbinates, which are sometimes assumed to be nasal polyps by the less experienced [14]. Various studies confirmed the predominance of squamous cell carcinoma in adult sinonasal cancers [15-17].

Clinical diagnosis of these unilateral nasal masses condition is based on the symptoms and clinical examination of the nose but often uses diagnostic tests like nasal endoscopy, imaging studies, and allergy tests. Histopathological examination plays a significant role in the diagnosis to rule out different types of malignancies [18]. The present study mainly focuses on the aetiopathological profile, age, and sex distribution of unilateral nasal masses presented to the tertiary care centre.

MATERIALS AND METHODS

The hospital-based cross-sectional study was conducted at the ENT OPD at Krishna Institute of Medical Sciences, Secunderabad, Telangana, India, from December 2020 to June 2021. The study was conducted after obtaining approval from the Institutional Ethical Committee (IEC). (KIMS/IEC/2020/07-02).

Inclusion criteria: A total of 53 patients of all age groups and both sexes presented with unilateral nasal masses were included in this study.

Exclusion criteria: Patients with bilateral nasal mass, hypertrophied inferior turbinate and concha bullosa were excluded from the study.

Study Procedure

After obtaining consent from the patients, all patients were evaluated thoroughly after a detailed history and complete ENT, head and neck, and systemic examination. Patients underwent nasal endoscopic and radiological examination {Computed tomography-paranasal sinuses (CT-PNS)}, to make an aetiological diagnosis of unilateral nasal mass. Cases with orbital and intracranial complications were further evaluated with {Magnetic Resonance Imaging (MRI)} and other relevant investigations. All cases of unilateral nasal mass were subjected to biopsy and sent for histopathological examination.

STATISTICAL ANALYSIS

Data entry was done using M.S. Excel and was statistically analysed using Statistical Package for Social Sciences (SPSS Version 16.0) for MS Windows. Descriptive statistical analysis was carried out to explore the distribution of several categorical and quantitative variables. Categorical variables were summarised with n (%), while quantitative variables were summarised by mean±Standard Deviation (SD). All results were also presented in tabular form and

were also shown graphically. The difference in the two groups was tested for statistical significance using parametric tests such as t-test, and categorical variables were tested by Chi-square test.

RESULTS

Out of these 53 patients who had unilateral nasal masses, the age range of patients was from 15-75 years with a mean age of 44 years. These masses were more commonly seen in males 47 (88.7%) than in females 6 (11.3), and the symptoms were also seen more on the right side, 35 (66%) than on the left side, 18 (34%). Nose block was the most common presenting symptom seen in 43 (81.1%) [Table/Fig-1].

Middle meatus was the most common site of the location of seen in 12 (22.6%) [Table/Fig-2].

Symptoms	n (%)
Nose block	43 (81.1)
Nasal discharge	3 (5.7)
Epistaxis	14 (26.4)
Eye swelling	1 (1.9)
Headache	6 (11.3)
Ear pain	1 (1.9)
Ear block	1 (1.9)
Swelling of forehead	1 (1.9)
Fever	1 (1.9)
Cheek swelling	1 (1.9)
Watering of eyes	1 (1.9)

[Table/Fig-1]: Symptoms distribution.

Anatomical location	n (%)
Septum	7 (13.2)
Frontal recess	3 (5.6)
Turbinate	6 (11.3)
Sphenoidal recess	1 (1.8)
Nasopharynx	3 (5.6)
Middle meatus	12 (22.6)
Choana	10 (18.8)
Ethmoid	11 (20.7)

[Table/Fig-2]: Location of the lesion distribution.

The most common clinical findings on nasal endoscopy were observed to be polyp 46 (86.8%) [Table/Fig-3]. Based on the histopathological analysis, the most common diagnosis was an inflammatory lesion in 24 (45.3%) [Table/Fig-4]. Among inflammatory lesions, ethmoidal polyps were the most common histopathological diagnosis 14 (26.4%) [Table/Fig-5].

Clinical finding	n (%)
Polyp	46 (86.8)
Smooth mass	5 (9.4)
Proliferative lesion	2 (3.8)
Total	53 (100)

[Table/Fig-3]: Clinical finding on diagnostic nasal endoscopy distribution.

Type of lesion	n (%)
Inflammatory	24 (45.3)
Fungal sinusitis	6 (11.3)
Granulomatous	2 (3.8)
Benign	15 (28.3)
Malignant	6 (11.3)
Total	53 (100)

[Table/Fig-4]: Type of lesion distribution as per histopathology.

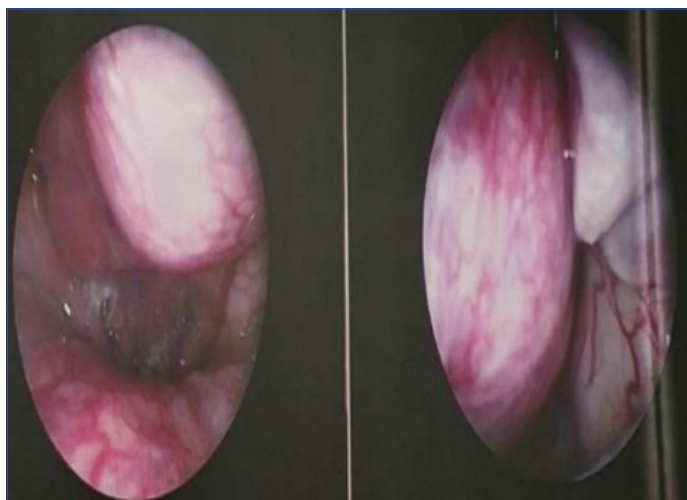
Type of lesion	Histopathological diagnosis	n (%)
Inflammation	Ethmoidal polyposis	14 (26.4)
	Antrochoanal polyp	10 (18.9)
Fungal sinusitis	Fungal sinusitis	6 (11.3)
Granulomatous	Wegener's granulomatosis	1 (1.9)
	Rhinosporidiosis	1 (1.9)
Benign	Haemangioma	5 (9.4)
	Ameloblastoma	1 (1.9)
	Inverted papilloma	5 (9.4)
	Craniopharyngioma	1 (1.9)
	Juvenile nasopharyngeal angiofibroma	2 (3.8)
	Olfactory neuroblastoma	1 (1.9)
Malignant	Squamous dysplasia	1 (1.9)
	Squamous cell carcinoma	4 (7.5)
Total		53 (100)

[Table/Fig-5]: Distribution of final diagnosis of lesions.

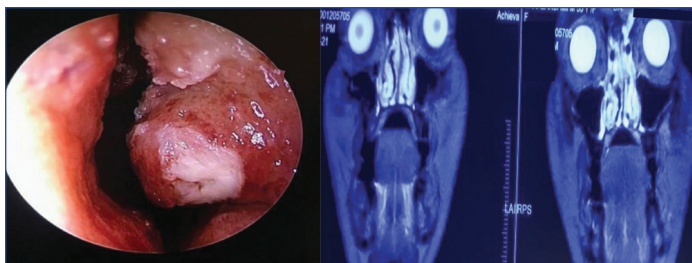
Final diagnosis vs clinical finding: All the inflammatory lesions presented as polyps. Even in malignant lesions, polyps were the most common. Mass was common in all benign lesions including the bleeding tumor like juvenile nasopharyngeal angiofibroma and other lesions like Wegener's granulomatosis, inverted papilloma, and squamous cell carcinoma. Proliferative lesions were found in malignant lesions and locally aggressive benign tumours like ameloblastoma [Table/Fig-6-11].

Final diagnosis	Polyp	Mass	Proliferative lesion	n
Ethmoidal polyposis	14	0	0	14
Haemangioma	4	1	0	5
Ameloblastoma	0	0	1	1
Craniopharyngioma	0	0	1	1
Inverted papilloma	4	1	0	5
Juvenile nasopharyngeal angiofibroma	1	1	0	2
Antrochoanal polyp	10	0	0	10
Squamous dysplasia	1	0	0	1
Rhinosporidiosis	1	0	0	1
Squamous cell carcinoma	3	1	0	4
Olfactory neuroblastoma	1	0	0	1
Adenoid cystic carcinoma	1	0	0	1
Fungal sinusitis	6	0	0	6
Wegener's granulomatosis	0	1	0	1
Total	46	5	2	53

[Table/Fig-6]: Table showing final diagnosis vs clinical finding.



[Table/Fig-7]: Juvenile Nasopharyngeal Angiofibroma (JNA)-Nasal endoscopic picture.

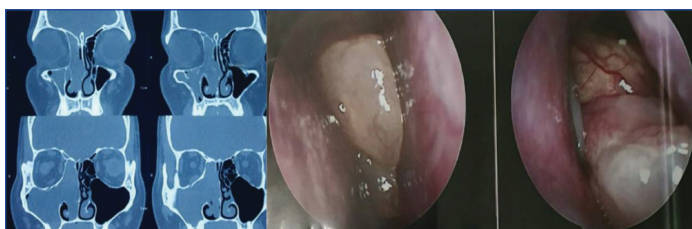


[Table/Fig-8]: Wegener's granulomatosis: Nasal endoscopic picture and MRI-PNS and neck with contrast.

*MRI-PNS: Magnetic resonance imaging (paranasal sinuses)

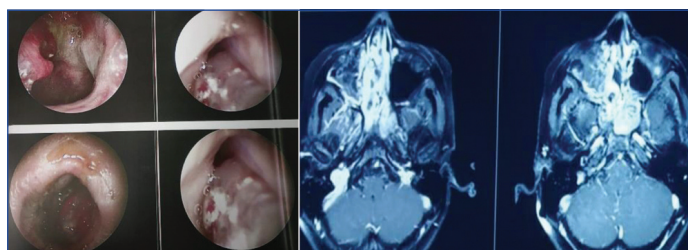


[Table/Fig-10]: Rhinosporidiosis: clinical photograph and CT-PNS picture.



[Table/Fig-9]: Inverted papilloma: CT-PNS and nasal endoscopic picture.

*CT-PNS: Computed tomography-paranasal sinuses



[Table/Fig-11]: Craniopharyngioma-nasal endoscopic picture and MRI-Brain with contrast.

DISCUSSION

Unilateral nasal masses can be broadly classified into non neoplastic and neoplastic lesions. Non neoplastic lesions could be inflammatory or granulomatous. Neoplastic lesions could be benign or malignant. Unilateral nasal masses always need special attention, as they have varied clinical symptoms and presentations. Early diagnosis with a high index of suspicion for malignancy helps prevent grave complications. The present study throws light on age and sex distribution, varied clinical presentations, aetiology, and pathology of unilateral nasal masses in all ranges of age groups.

In the present study, most of the unilateral nasal masses presented with nose block (81.1%). This was probably because any inflammation in the nasal mucosa, irrespective of its cause will lead to nasal obstruction. But, the severity of nasal obstruction may vary from person to person, what one person feels may be of less importance to another patient with the same level of obstruction [5]. Other symptoms

were epistaxis, headache, nasal discharge etc. These were consistent with the study by Nair S et al., stated nasal obstruction as the commonest symptom followed by rhinorrhoea, headache, epistaxis, facial pain, hyposmia, and less frequently orbital symptoms [19].

The middle meatus 12 (22.64%) was the most common site of origin of unilateral nasal mass on endoscopy. In the middle meatus common site was ethmoid. Other sites were choana, septum, turbinate, frontal recess, nasopharynx, and sphenoid. These findings were similar to the study by Sridhar Rao M et al., which reports the most common site of unilateral nasal mass being the middle meatus followed by the lateral wall, roof of the nasal cavity and the nasopharynx [20]. The study by Bakari A et al., conducted illustrates ethmoidal sinus, maxillary sinus, and osteomeatal complex as the commonest site followed by frontal sinus, sphenopalatine foramen, septum, skull base, and middle turbinate [14].

On endoscopy, the most common findings were polyps followed by mass and proliferative lesions. These findings were also consistent with the study by Sridhar Rao M et al., where polypoidal lesions were seen in 70%, fleshy in 18.45%, and ulceroproliferative in 2.92% [Table/Fig-12] [14,18-23].

Reference	Year	Sample size	Age range (years)	Symptoms	Site	Aetiopathogenesis
Present study	2022	53	50-60	Nose block 81.1%	Middle meatus 22.64	Inflammatory 60.4%
				Epistaxis 26.4%	Ethmoid 20.75%	Benign 28.30%
				Headache 11.3%	Turbinate 11.32%	Malignant 11.3%
Nair S et al., [19]	2011	53	Median-42	Nose block 93.2%		Inflammatory 83.1%
				Epistaxis 9.1%		Benign 31.9%
				Facial pain 25%		Malignant 9.29%
Sridhar Rao M et al., [20]	2017	206	21-30	Nose block 96%	Middle meatus 67%	Inflammatory 72.8%
				Rhinorrhoea 52%	Lateral wall 25.4%	Benign 22.8%
						Malignant 4.37%
Gomes P et al., [21]	2020	150		Nose block 88.7%	Maxillary sinus 78%	Inflammatory 64.7%
				Rhinorrhoea 46.4%	Ethmoid 71.3%	Neoplastic 35.3%
				Postnasal drip 44.3	Frontal 34.6%	
Bakari A et al., [14]	2010	76	21-50	Nose block 97.4%		Inflammatory 77.6%
				Rhinorrhoea 94.7%		Malignant 2.6%
				Postnasal discharge 44.3%		
Aljafar H et al., [18]	2020	90		Nose block 38%		Inflammatory 33.36%
				Rhinorrhoea 17%		Benign 26.28%
				Epistaxis 14%		Malignant 18.2%
Shuaibu I et al., [22]	2020	38	50.8	Nose block 38%		Inflammatory 62.1%
				Epistaxis 36.8%		Benign 39.5%
				Facial pain 15.8%		Malignant 18.4%
Belli S [23]	2018	195	42	-	-	Inflammatory 83.1%
						Neoplastic 16.9%

[Table/Fig-12]: Illustrates the comparison of the present study with other studies [14,18-23].

Limitation(s)

The sample size is relatively too small, to make population-based conclusions.

CONCLUSION(S)

Incidence of unilateral nasal mass was more common in the 5th to 6th decades of life and seen more commonly in males than females. Histopathologically inflammatory lesions are the most common, followed by benign and malignant lesions. The clinical presentation of unilateral nasal lesions may be indistinguishable, therefore, thorough evaluation of patients with nasal endoscopy, relevant imaging, and histopathological examination are extremely important for accurate diagnosis and early intervention.

REFERENCES

- [1] Karthikeya P, Mahima VG, Bhavna G. Sinonasal verrucous carcinoma with oral invasion. *Indian J Dent Res.* 2006;1:82-86.
- [2] Kristensen S, Vorre P, Elbrond O, Sogaard H. Nasal schneiderian papillomas. *Clin Otolaryngol.* 1985;10:12534.
- [3] Haerle SK, Gullane PJ, Witterick IJ, Zweifel C, Gentili F. Sinonasal carcinomas. epidemiology, pathology, and management. *Neurosurg Clin N Am [Internet]. Elsevier Inc.* 2013;24(1):39-49.
- [4] Goy J, Hall SF, Feldman-Stewart D, Groome P. Diagnostic delay and disease stage in head and neck cancer: A systematic review. *Laryngoscope.* 2009;119(5):889-98.
- [5] Fasunla J, Ogunkeyede SA. Factors contributing to poor management outcome of sinonasal malignancies in South-west Nigeria. *Ghana Med J [Internet].* 2013;47(1):10-15.
- [6] Rawat DS, Chadha V, Grover M, Ojha T, Verma PC. Clinico-pathological profile and management of sino-nasal masses: A prospective study. *Indian J Otolaryngol Head Neck Surg.* 2013;65(Suppl 2):388-93.
- [7] Chukuezi AB, Nwosu JN. Pattern of nasal and paranasal sinus tumours in Owerri, Nigeria. *Res J Med Sci.* 2010;p:11-14.
- [8] Zafar U, Khan N, Afroz N, Hasan S. Clinicopathological study of non-neoplastic lesions of nasal cavity and paranasal sinuses. *Indian J Pathol Microbiol. Medknow Publications;* 2008;51(1):26.
- [9] Ogunleye A, Fasunla A. Nasal polyps-clinical profile and management in Ibadan, Nigeria. *Niger J Surg Res.* 2006;7(1):164-67.
- [10] Lathi, Syed MM, Kalakoti P, Qutub D, Kishve SP. Clinico-pathological profile of sinonasalmasses: A study from a tertiary care hospital of India. *Acta Otorhinolaryngol Ital.* 2011;31:372-77.
- [11] Humayun AHP, Huq AZ, Ahmed ST, Kamal MS, Kyaw Khin U, Bhattacharjee N, et al. Clinicopathological study of sinonasal masses. *Bangladesh J Otorhinolaryngol.* 2010;16(1):15-22.
- [12] Nepal A, Chettri ST, Joshi JJ, Karki S. Benign sinonasal masses: A clinicopathological and radiological profile. *Kathmandu Univ Med J.* 2013;41(1):04-08.
- [13] Dasgupta A, Ghosh RN, Mukherjee C. Nasal polyps-histopathologic spectrum. *Indian J Otolaryngol Head Neck Surg.* 1997;49(1):32-37.
- [14] Bakari A, Afolabi OA, Adoga AA, Kodya AM, Ahmad BM. Clinico-pathological profile of sinonasal masses: An experience in national ear care center Kaduna, Nigeria. *BMC Res Notes.* 2010;3:186.
- [15] Dubal P, Sanghvi S, Raikundalia M, Kanumuri VV, Svider PF, Baredes S, et al. Sinonasal Malignancies: Site-specific incidence and survival in 12,582 patients. *Neuro Insti N Jersey.* 2013.
- [16] Chu Y, Liu HG, Yu ZK. Patterns and incidence of sinonasal malignancy with orbital invasion. *Chin Med J (Engl).* 2012;125(9):1638-42.
- [17] 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 J Maxillofac Surg.* 2012;3(2):180-86.
- [18] Aljafar H, Alenazi E, Alkhatib A, Alazeh G, Almomen A. The clinicopathological and radiological features of unilateral nasal mass in adults, a tertiary hospital experience. *Int J Otorhinolaryngol Head Neck Surg.* 2020;6(7).
- [19] Nair S, James E, Awasthi S, Nambiar S, Goyal S. A review of the clinicopathological and radiological features of unilateral nasal mass. *Indian J Otolaryngology and Head & Neck Surg.* 2011;65(S2):199-04.
- [20] Sridhar Rao M, Prasad AS, Shaila, G.Baleswari. Clinico-pathological profile of Sinonasal masses in a tertiary care hospital. *Indian J App Res.* 2017;7(1):939-41.
- [21] Gomes P, Gomes A, Salvador P, Lombo C, Caselhos S, Fonseca R. Clinical assessment, diagnosis and management of patients with unilateral sinonasal disease. *Acta Otorrinolaringológica Española.* 2020;71(1):16-25.
- [22] Shuaibu I, Usman, Ajija A. Unilateral sinonasal masses: Review of clinical presentation and outcome in Ahmadu Bello university teaching hospital, Zaria, Nigeria. *Niger Med J.* 2020;61:16-21.
- [23] Belli S, Yildirim M, Eroglu S, Emre FK. Single-sided sinonasal mass: A retrospective study. *North Clin Istanbul.* 2018;5(2):139-43.

PARTICULARS OF CONTRIBUTORS:

1. Senior Resident, Department of Otorhinolaryngology, KIMS Hospital, Minister Road, Secunderabad, Telangana, India.
2. Senior Consultant, Department of Otorhinolaryngology, KIMS Hospital, Minister Road Secunderabad, Telangana, India.
3. Associate Professor, Department of Otorhinolaryngology, SVIMS-Sri Padmavathi Medical College for Women, Tirupati, Andhra Pradesh, India.
4. Senior Consultant, Department of Otorhinolaryngology, KIMS Hospital, Minister Road, Secunderabad, Telangana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ajay Kumar Neeli,
Senior Consultant, Department of Otorhinolaryngology, KIMS Hospital,
Secunderabad-500003, Telangana, India.
E-mail: drajayneeli@gmail.com, doc_amarnath@yahoo.co.in

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Oct 13, 2022
- Manual Googling: Nov 22, 2022
- iThenticate Software: Nov 25, 2022 (19%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Oct 12, 2022**
Date of Peer Review: **Nov 01, 2022**
Date of Acceptance: **Nov 26, 2022**
Date of Publishing: **Dec 01, 2022**