



Unilateral Sinonasal Masses: Insights from a Retrospective Study

<https://doi.org/10.47210/bjohns.2026.v34i1.283>

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ABSTRACT

Introduction

Unilateral sinonasal masses are a common clinical entity in otolaryngology, often presenting with nonspecific symptoms. Although inflammatory lesions predominate, neoplastic conditions may present similarly, necessitating a high degree of clinical vigilance.

Materials and Methods

A retrospective analysis was conducted on patients presenting with unilateral sinonasal masses at a tertiary care centre between January 2021 and December 2022. Based on histopathological evaluation, cases were stratified into inflammatory and neoplastic groups. Demographic characteristics, clinical presentation, radiological findings, and treatment outcomes were analysed.

Results

The study included 34 patients (mean age: 35 ± 16 years), with a male predominance (64.7%). Inflammatory lesions accounted for 79.4% of cases, with inflammatory polyps being the most prevalent histological subtype (29.4%). Neoplastic lesions comprised 20.6% of cases, including a single instance (2.9%) of poorly differentiated squamous cell carcinoma. The majority underwent endoscopic surgical management, predominantly functional endoscopic sinus surgery. No recurrences were observed during one year of follow-up.

Conclusion

Inflammatory polyps represent the most frequent aetiology of unilateral sinonasal masses. Given the diagnostic overlap with neoplastic lesions, comprehensive evaluation incorporating endoscopy, imaging, and histopathology remains imperative for accurate diagnosis and optimal management.

Keywords

Unilateral Sinonasal Mass; Inflammatory Polyps; Sinonasal Malignancy; Inverted Papilloma

Unilateral nasal obstruction is a frequently encountered complaint in otolaryngological practice, with a broad differential diagnosis ranging from anatomical deviations to space-occupying lesions. Sinonasal masses, defined as abnormal proliferative growths within the nasal cavity or paranasal sinuses, represent approximately 6% of all sinonasal pathologies.¹ Clinical manifestations are often variable,

encompassing mild symptoms such as rhinorrhoea, facial fullness, nasal congestion, and hyposmia, to more overt features including epistaxis, fetid nasal discharge, facial pain or swelling, proptosis, and diplopia.²

The underlying aetiology spans a wide spectrum, from inflammatory conditions such as nasal polyps, mucocoeles, retention cysts, fungal rhinosinusitis, and granulomatous diseases, to benign and malignant neoplasms like inverted papilloma, olfactory neuroblastoma, and squamous cell carcinoma. Distinguishing neoplastic lesions from inflammatory or infectious conditions remains a clinical challenge, particularly when initial presentations mimic those of chronic rhinosinusitis.

Key differentiators between benign and malignant lesions include specific symptomatology, lesion

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morphology, anatomical site, extent of local invasion, and radiological characteristics.³ Nevertheless, definitive diagnosis cannot be reliably established through clinical assessment alone. Therefore, a comprehensive evaluation, comprising diagnostic nasal endoscopy and imaging studies, is indispensable. Crucially, histopathological examination remains the gold standard for diagnosis, guiding both surgical planning and therapeutic strategies.^{1,4,5}

This study aims to evaluate the demographic, clinical, radiological, and histopathological characteristics of unilateral sinonasal masses, with particular emphasis on diagnostic challenges and treatment outcomes.

Materials and Methods

A retrospective descriptive study was conducted at a tertiary care centre, following approval from the Institutional Ethics Committee. Patients diagnosed and treated for unilateral sinonasal masses over a 12-month period were identified from hospital records. Cases with incomplete clinical or diagnostic information were excluded, resulting in a final sample of 34 patients.

Data were collected on demographic profile, presenting complaints, findings from anterior rhinoscopy and diagnostic nasal endoscopy, radiological imaging (CT/MRI), intraoperative details, histopathological diagnosis, and treatment administered. Follow-up telephone interviews were conducted with patients to evaluate their current clinical status and treatment outcomes.

Patients were categorised into three groups based on histopathological diagnosis: non-neoplastic lesions, benign neoplasms, and malignant neoplasms. Statistical analysis was carried out using SPSS software. Fisher's exact test was used to assess the association between gender and histopathological type, while the Mann-Whitney U test was applied to compare age and duration of symptoms between groups. A p-value of <0.05 was considered statistically significant.

Results

A total of 34 patients with unilateral sinonasal masses were included in the study, comprising 22 males (64.7%) and 12 females (35.3%). The mean age at presentation was 35.4 ± 16.2 years (range: 7–67 years). The majority of cases were within the 31–50-year age group ($n = 15$; 44.2%). The mean duration of symptoms before presentation was 35 weeks (range: 1–156 weeks). Neoplastic lesions presented with a shorter symptom duration (mean = 27 weeks) compared to non-neoplastic lesions (mean = 37 weeks), although the difference was not statistically significant ($p=0.089$).

Histopathological analysis identified non-neoplastic lesions in 27 patients (79.4%), benign neoplasms in 6 (17.7%), and malignant pathology in 1 (2.9%). Although non-neoplastic and malignant lesions were more frequently observed in males, and the mean age at presentation ranged between 35 and 36 years across all histopathological categories, neither gender distribution nor age demonstrated statistical significance. (Table 1)

Nasal obstruction was the most prevalent presenting symptom, reported in 24 patients (70.6%), particularly in cases of non-neoplastic and benign pathology. Epistaxis and a visible nasal mass were reported in 3 patients each (8.8%), while facial swelling and rhinorrhoea were the least frequent symptoms, each reported by 2 patients (5.9%). The sole malignant case presented with a visible mass, and on detailed evaluation, also had nasal obstruction and altered nasal resonance. (Table 1)

All patients underwent diagnostic nasal endoscopy. A solitary pale polypoidal mass was the most common endoscopic finding, seen in 11 patients (32.4%). Computed tomography (CT) of the paranasal sinuses was performed in 24 patients (70.6%), confirming unilateral sinonasal pathology in all. One patient (2.9%) demonstrated bony erosion, while features of allergic fungal rhinosinusitis and rhinolith were observed in two patients (5.9%). Ten patients (29.4%) underwent plain radiography of the paranasal sinuses, although findings were diagnostic in only 5 cases (14.7%): unilateral maxillary sinus opacification in 4 (11.8%) and calcified intranasal opacity in 1 (2.9%).

Table 1: Distribution of the study population by pathology, gender and symptoms

	PATHOLOGY			TOTAL	p value
	NON NEOPLASTIC	BENIGN	MALIGNANT		
GENDER					
Male	9	3	0	12 (35.3%)	0.677
Female	18	3	1	22 (64.7%)	
Total	27 (79.4%)	6 (17.7%)	1 (2.9%)	34 (100%)	
SYMPTOMS					
Epistaxis	2	1	0	3 (8.8%)	
Facial Swelling	2	0	0	2 (5.9%)	
Nasal Mass	0	2	1	3 (8.8%)	
Nasal Obstruction	21	3	0	24 (70.6%)	
Rhinorrhoea	2	0	0	2 (5.9%)	
Total	27 (79.4%)	6 (17.7%)	1 (2.9%)	34 (100%)	

Inflammatory nasal polyps constituted the most common histological diagnosis (n = 10; 29.4%), followed by allergic polyps (n = 8; 23.5%). Other non-neoplastic entities included rhinosporidiosis (n = 2; 5.9%) and mucoceles (n = 1; 2.9%). Among benign neoplasms, capillary haemangiomas were most prevalent (n = 3; 8.8%), followed by inverted papillomas (n = 2; 5.9%). A single case of poorly differentiated squamous cell carcinoma was identified (n = 1; 2.9%) (Table 2). There was a good correlation between clinical and histopathological diagnoses (Cohen's $\kappa = 0.089$).

Surgical intervention was performed in 33 patients (97.2%). Functional endoscopic sinus surgery (FESS) was the most common approach (n = 20; 58.8%). Endoscopic excision without sinus surgery was carried out in 7 cases (20.6%), and 6 patients (17.6%) underwent excision with cauterisation. The patient diagnosed with malignancy was referred for chemoradiotherapy. All surgically managed patients had an uneventful postoperative course, with no recurrence or residual disease noted during the 12-month follow-up period.

Table II: Histopathological distribution of Unilateral sinoasal mass

HISTOPATHOLOGIC DISEASE	n = 34
Non-Neoplastic	
Inflammatory Polyp	10 (29.4%)
Allergic Polyp	8 (23.5%)
Rhinolith	3 (8.8%)
Rhinosporidiosis	2 (5.9%)
Extravasation Mucocele	1 (2.9%)
Pyogenic Granuloma	1 (2.9%)
Benign neoplastic	
Capillary Haemangioma	3 (8.8%)
Inverted Papilloma	2 (5.9%)
Haemangioma	1 (2.9%)
Malignant	
Poorly differentiated squamous cell carcinoma	1 (2.9%)

Discussion

Unilateral sinonasal mass lesions continue to pose a diagnostic dilemma due to their heterogeneous etiologies and account for approximately 6% of all sinonasal pathologies.⁴ Establishing an accurate diagnosis necessitates a meticulous clinical history, comprehensive physical examination, diagnostic nasal endoscopy, and radiological imaging. However, histopathological evaluation remains the definitive method for establishing the nature of these lesions.⁵

Chronic rhinosinusitis remains the most frequently encountered pathology associated with sinonasal masses. This condition may arise secondary to bacterial, fungal, or parasitic infections, or it may represent a manifestation of IgE-mediated or non-IgE-mediated hypersensitivity, ultimately leading to the formation of nasal polyps.⁶ Less common etiologies include HPV-related papillomas, premalignant entities such as Schneiderian papillomas, lesions arising from vascular structures, congenital anomalies like meningocele or meningoencephalocele extending into the nasal cavity, and malignant tumours including carcinomas, sarcomas, or, more rarely, metastatic disease.⁷

In the present analysis, the mean age at presentation was 35.4 years, closely aligning with the findings reported by Bakari A et al.⁷ Nasal obstruction was the predominant presenting symptom, corroborating the findings of previous investigations by Humayun et al., Dasgupta et al., and Pradhananga et al.^{8,9,10}

Nasal polyps represented the most frequently identified pathology in this study, consistent with observations reported by Belli et al. and Lee JY et al.^{11,12} Overall, non-neoplastic lesions constituted the majority of unilateral sinonasal masses, in concordance with the findings of Kahveci et al.¹³ This contrasts with the study by Shuaibu et al., who reported a higher incidence of neoplastic lesions, likely attributable to the relatively older age group evaluated in their series.¹⁴ These findings reinforce the imperative of maintaining a high index of clinical suspicion for malignancy, particularly in older individuals presenting with unilateral nasal masses.¹⁴

Among the non-neoplastic entities, inflammatory

polyps were the most prevalent, a trend similarly reported by Kucur et al.¹⁵ Inverted papilloma emerged as the most common benign neoplasm in our series (5.9%), a finding comparable to that of Shuaibu et al.¹⁴ Despite its benign histological classification, inverted papilloma is recognized for its aggressive local behavior, notable recurrence rates, and potential for malignant transformation.¹⁶ Importantly, no recurrence or evidence of malignant change was observed in any of our patients during the follow-up period.

Squamous cell carcinoma was the only malignancy detected, accounting for 2.9% of cases. This observation is in agreement with findings from Nair et al., who also identified squamous cell carcinoma as the most prevalent unilateral sinonasal malignancy, followed by adenocarcinoma and non-Hodgkin lymphoma.¹⁷

Conclusion

Unilateral sinonasal masses, often presenting in the fourth decade, remain diagnostically challenging due to nonspecific clinical features. While inflammatory polyps are most common, the possibility of neoplastic lesions must not be overlooked. A combined approach involving imaging and histopathological confirmation is essential for accurate diagnosis and appropriate management.

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