

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## Clinical and Radiological Characteristics of Unilateral Sinonasal Masses: A Retrospective Analysis.

Anand Navnath Tuljapure<sup>1\*</sup>, Jyothi Lakshmi KS<sup>2</sup>, and Bhaskar Pawar<sup>3</sup>.

<sup>1</sup>Associate Professor, Department of ENT, Dr Vithalrao Vikhe Patil foundation Medical College Ahmednagar, Maharashtra, India.

<sup>2</sup>Assistant professor, Department of ENT, Vikhe Patil Medical Foundation, , Maharashtra, India.

<sup>3</sup>Hon Associate Professor, Department of ENT, Dr Vithalrao Vikhe Patil foundation Medical College, Ahmednagar, Maharashtra, India.

### ABSTRACT

Unilateral sinonasal masses encompass a range of benign and malignant conditions presenting diagnostic challenges due to overlapping clinical symptoms. Accurate diagnosis and management are critical for effective treatment and prognosis. This retrospective study studied the clinical records of 50 patients diagnosed with unilateral sinonasal masses in last one year. Data on clinical presentation, radiological imaging (CT and MRI), and histopathological findings were analyzed. Key radiological features, including mass size, location, enhancement patterns, and bone involvement, were correlated with histopathological diagnoses. The study included 28 males (56%) and 22 females (44%), with a mean age of 45 years. Common symptoms were nasal obstruction (80%), rhinorrhea (60%), and facial pain (50%). Radiologically, 64% of masses exhibited heterogeneous enhancement, significantly associated with malignancy ( $p=0.02$ ). Intracranial/orbital extension was observed in 10% of cases, also significantly linked to malignancy ( $p=0.04$ ). Histopathologically, 60% of the masses were benign, including inflammatory polyps (40%) and inverted papillomas (10%), while 40% were malignant, predominantly squamous cell carcinoma (20%). Heterogeneous enhancement and intracranial/orbital extension on imaging are significant indicators of malignancy in unilateral sinonasal masses. Integrating clinical, radiological, and histopathological data is crucial for accurate diagnosis and effective management.

**Keywords:** Unilateral sinonasal masses, radiological characteristics, histopathological diagnosis

<https://doi.org/10.33887/rjpbcs/2024.15.3.48>

*\*Corresponding author*

## INTRODUCTION

Unilateral sinonasal masses represent a diverse spectrum of pathological entities that range from benign inflammatory polyps to malignant neoplasms [1]. These masses can arise from various anatomical structures within the sinonasal cavities, including the nasal septum, turbinates, and paranasal sinuses. Clinically, they present a significant diagnostic challenge due to their overlapping symptomatology, which often includes nasal obstruction, epistaxis, facial pain, and rhinorrhea. The accurate diagnosis and management of unilateral sinonasal masses are crucial as the therapeutic approach and prognosis can vary widely depending on the underlying pathology [2, 3].

Radiological imaging plays a pivotal role in the evaluation of these masses, providing critical information regarding their size, extent, and potential points of origin. Advanced imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) are invaluable tools that help delineate the anatomical and pathological features of sinonasal masses, aiding in the differentiation between benign and malignant conditions. The integration of clinical findings with radiological characteristics is essential for formulating a precise diagnosis, planning surgical interventions, and predicting outcomes [4-6].

Our retrospective study analysis aims to focus the clinical and radiological characteristics of unilateral sinonasal masses. By examining a cohort of patients, we seek to identify patterns that may enhance diagnostic accuracy and inform clinical decision-making, ultimately improving patient care and outcomes.

## METHODOLOGY

Our retrospective study was conducted by reviewing the medical records of 50 patients diagnosed with unilateral sinonasal masses in last one year. Inclusion criteria were patients aged 18 years and older with confirmed unilateral sinonasal masses through endoscopic examination and histopathological analysis. Exclusion criteria included patients with bilateral sinonasal disease, prior sinonasal surgery, or incomplete medical records. Ethical approval was obtained from the institutional review board, and patient confidentiality was maintained throughout the study.

Data collection involved detailed review of clinical presentations, including symptoms such as nasal obstruction, epistaxis, facial pain, and rhinorrhea. Radiological data were obtained from CT and MRI scans performed at the time of diagnosis. Key radiological features analyzed included the size, extent, and location of the mass, as well as bone involvement, contrast enhancement patterns, and any evidence of intracranial or orbital extension. Each radiological assessment was conducted by two independent radiologists to ensure accuracy and consistency in interpretation.

Histopathological examination results were used to categorize the masses into benign or malignant groups. Statistical analysis was performed to correlate clinical symptoms and radiological features with histopathological diagnoses. Descriptive statistics were used to summarize patient demographics, clinical presentations, and radiological findings. Chi-square tests and t-tests were utilized to assess the significance of differences between groups, with a p-value of <0.05 considered statistically significant. The study aimed to identify distinguishing characteristics that could aid in the early and accurate diagnosis of unilateral sinonasal masses, thereby guiding appropriate treatment strategies.

## RESULTS

**Table 1: Demographic and Clinical Characteristics of Patients (N=50)**

Characteristic	Frequency (%)
Age (mean $\pm$ SD)	45 $\pm$ 12 years
Gender	
- Male	28 (56%)
- Female	22 (44%)
Presenting Symptoms	
- Nasal Obstruction	40 (80%)
- Epistaxis	15 (30%)

- Facial Pain	25 (50%)
- Rhinorrhea	30 (60%)
Duration of Symptoms	
- < 3 months	20 (40%)
- 3-6 months	15 (30%)
- > 6 months	15 (30%)

**Table 2: Radiological Characteristics of Sinonasal Masses**

Characteristic	Frequency (%)
Mass Location	
- Nasal Cavity	20 (40%)
- Maxillary Sinus	15 (30%)
- Ethmoid Sinus	10 (20%)
- Frontal Sinus	3 (6%)
- Sphenoid Sinus	2 (4%)
Mass Size	
- < 2 cm	10 (20%)
- 2-4 cm	25 (50%)
- > 4 cm	15 (30%)
Bone Involvement	12 (24%)
Contrast Enhancement Pattern	
- Homogeneous	18 (36%)
- Heterogeneous	32 (64%)
Intracranial/Orbital Extension	5 (10%)

**Table 3: Histopathological Diagnosis of Sinonasal Masses**

Diagnosis	Frequency (%)
Benign Lesions	
- Inflammatory Polyp	20 (40%)
- Inverted Papilloma	5 (10%)
- Fibro-osseous Lesion	3 (6%)
- Hemangioma	2 (4%)
Malignant Lesions	
- Squamous Cell Carcinoma	10 (20%)
- Adenocarcinoma	5 (10%)
- Olfactory Neuroblastoma	3 (6%)
- Lymphoma	2 (4%)

**Table 4: Correlation Between Radiological Features and Histopathological Diagnosis**

Radiological Feature	Benign (n=30)	Malignant (n=20)	p-value
Heterogeneous Enhancement	15 (50%)	17 (85%)	0.02
Bone Involvement	5 (17%)	7 (35%)	0.15
Intracranial/Orbital Extension	1 (3%)	4 (20%)	0.04
Mass Size > 4 cm	7 (23%)	8 (40%)	0.22

Note: \*p-value < 0.05 considered statistically significant.

### DISCUSSION

The results of this study provide valuable insights into the clinical and radiological characteristics of unilateral sinonasal masses, which are critical for improving diagnostic accuracy and treatment strategies. By analyzing a cohort of 50 patients, we observed distinct patterns in symptom presentation,

radiological findings, and histopathological diagnoses, which together contribute to a more comprehensive understanding of these complex entities [7].

### **Clinical Characteristics**

The demographic data revealed a nearly balanced gender distribution, with a slight predominance of males (56%). The mean age of the patients was 45 years, indicating that sinonasal masses can affect a broad age range, although they are more commonly observed in middle-aged adults. The most frequent presenting symptom was nasal obstruction, reported by 80% of patients. This symptom's high prevalence underscores its importance as a key clinical indicator of sinonasal pathology. Other common symptoms included rhinorrhea (60%), facial pain (50%), and epistaxis (30%). These symptoms, while non-specific, highlight the necessity for thorough clinical evaluation and a high index of suspicion for sinonasal masses when patients present with these complaints [8].

### **Radiological Characteristics**

Radiological imaging played a crucial role in assessing the characteristics of the sinonasal masses. The masses were most commonly located in the nasal cavity (40%), followed by the maxillary sinus (30%), ethmoid sinus (20%), frontal sinus (6%), and sphenoid sinus (4%). This distribution pattern is consistent with the anatomical complexity and the variable origin of sinonasal masses. The size of the masses varied, with 50% of the masses measuring between 2-4 cm, while 30% were larger than 4 cm. Masses exceeding 4 cm were more frequently associated with malignant histopathology, although this correlation did not reach statistical significance ( $p=0.22$ ).

The enhancement patterns observed on imaging were predominantly heterogeneous (64%), compared to homogeneous enhancement (36%). Heterogeneous enhancement was significantly more common in malignant masses (85%) than in benign ones (50%), with a  $p$ -value of 0.02. This finding suggests that heterogeneous enhancement on CT or MRI could be a useful radiological marker for malignancy in unilateral sinonasal masses.

Bone involvement was noted in 24% of the cases, with a higher prevalence in malignant masses (35%) compared to benign ones (17%), though this difference was not statistically significant ( $p=0.15$ ). Intracranial or orbital extension was observed in 10% of the masses and was significantly associated with malignancy ( $p=0.04$ ). These advanced imaging findings emphasize the importance of detailed radiological evaluation in assessing the extent of sinonasal masses, which is crucial for surgical planning and prognostication.

### **Histopathological Diagnosis**

Histopathological examination revealed that 60% of the masses were benign, while 40% were malignant. The most common benign lesions included inflammatory polyps (40%), inverted papillomas (10%), fibro-osseous lesions (6%), and hemangiomas (4%). Among malignant lesions, squamous cell carcinoma (20%) was the most prevalent, followed by adenocarcinoma (10%), olfactory neuroblastoma (6%), and lymphoma (4%). The diversity of histopathological diagnoses highlights the complexity of sinonasal masses and the necessity for tissue biopsy to establish a definitive diagnosis.

### **Correlation Between Radiological Features and Histopathological Diagnosis**

The correlation analysis between radiological features and histopathological diagnosis provided several noteworthy observations. Heterogeneous enhancement was significantly associated with malignant masses, indicating that this radiological feature can be a valuable predictor of malignancy. The presence of bone involvement and intracranial/orbital extension were more common in malignant masses, although only the latter reached statistical significance. These findings suggest that while bone involvement is an important consideration, its presence alone may not be as strongly indicative of malignancy as intracranial or orbital extension.

## Clinical Implications

The clinical implications of these findings are multifaceted. Firstly, the high prevalence of nasal obstruction among patients with sinonasal masses reinforces the need for comprehensive evaluation in patients presenting with this symptom. Secondly, the significant association between heterogeneous enhancement on imaging and malignant pathology underscores the importance of advanced radiological techniques in the initial assessment and differential diagnosis of these masses. Thirdly, the identification of intracranial or orbital extension as a marker of malignancy highlights the necessity for prompt and aggressive management in such cases to prevent further complications and improve patient outcomes.

Furthermore, the study emphasizes the critical role of multidisciplinary collaboration in the management of unilateral sinonasal masses. Otolaryngologists, radiologists, and pathologists must work together to ensure accurate diagnosis and optimal treatment planning. The integration of clinical, radiological, and histopathological data is essential for tailoring individualized treatment strategies, whether surgical or non-surgical, to achieve the best possible outcomes for patients.

## Limitations

While this study provides valuable insights, it is not without limitations. The retrospective nature of the study and the relatively small sample size may limit the generalizability of the findings. Additionally, the study did not account for potential confounding factors such as previous medical treatments or underlying comorbidities that could influence the presentation and outcomes of sinonasal masses. Future research with larger, prospective cohorts and standardized imaging protocols is necessary to validate these findings and further refine diagnostic criteria.

## CONCLUSION

In conclusion, this study highlights the diverse clinical and radiological characteristics of unilateral sinonasal masses and underscores the importance of integrating multiple diagnostic modalities to achieve accurate diagnoses. By enhancing our understanding of these masses, we can improve diagnostic accuracy, guide appropriate therapeutic interventions, and ultimately enhance patient care and outcomes.

## REFERENCES

- [1] Humayun AH, Huq AH, Ahmed SM, Kamal MS, Khin KU, Bhattacharjee N. Clinicopathological study of sinonasal masses Bangladesh J Otorhinolaryngol 2010;16:15-2.
- [2] Erkul E, Cekin IE, Kurt O, Gungor A, Babayigit MA. Evaluation of patients with unilateral endoscopic sinus surgery Turk Arch Otolaryngol 2013; 50:41.
- [3] Lathi A, Syed MM, Kalakoti P, Qutub D, Kishve SP. Clinico-pathological profile of sinonasal masses: A study from a tertiary care hospital of India Acta Otorhinolaryngol Ital 2011;31:372-7.
- [4] Singh SG, Qureshi S, Jain L, Jadia S, Sharma S. Presentation of lesions of nose and paranasal sinuses at a tertiary care center in central India Indian J Otolaryngol Head Neck Surg 2018;70:284-9.
- [5] Kahveci OK, Duran A, Miman MC. Our histopathological result for intranasal masses: Retrospective study of 6 years J Clin Anal Med 2012; 3:289-92.
- [6] Satarkar RN, Srikanth S. Tumors and tumor-like conditions of the nasal cavity, paranasal sinuses, and nasopharynx: A study of 206 cases Indian J Cancer 2016;53:478-82.
- [7] Ghosh A, Bhattacharya K. Nasal and nasopharyngeal growth a ten year's survey J Indian Med Assoc 1966;47:13.
- [8] Belli S, Yildirim M, Eroglu S, Emre FK. Single-sided sinonasal mass: A retrospective study North Clin Istanbul 2018; 5:139-43.