



Clinicopathological Spectrum of Sino-Nasal Tumors: A Five-Year Retrospective Study from A Tertiary Care Center in Rajasthan

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ABSTRACT

Background: Sinonasal tumors are rare neoplasms characterized by wide histopathological heterogeneity and aggressive clinical behavior. Their deep anatomical location and nonspecific presenting symptoms often lead to delayed diagnosis and advanced disease at presentation.

Objective: To evaluate the clinicopathological spectrum of sinonasal tumors diagnosed at a tertiary care center in Rajasthan over a five-year period.

Materials and Methods: This retrospective study included all sinonasal tumor specimens received in the Department of Pathology from January 2021 to December 2025. Clinical data were retrieved from medical records. Formalin-fixed, paraffin-embedded tissues were processed routinely and stained with hematoxylin and eosin. Non-neoplastic lesions were excluded.

Results: A total of 142 sinonasal tumors were analyzed. Patient age ranged from 12 to 78 years with a mean age of 46.3 years. Male predominance was observed (M:F = 1.8:1). Benign tumors constituted 58.5% (n=83), while malignant tumors comprised 41.5% (n=59). Inverted papilloma was the most common benign tumor (34.9%). Squamous cell carcinoma was the most frequent malignant tumor (45.8%). Nasal obstruction (78%) and epistaxis (52%) were the most common presenting symptoms.

Conclusion: Sinonasal tumors demonstrate diverse histopathological patterns. Early recognition and histopathological evaluation remain the cornerstone for appropriate diagnosis and management.

Keywords: Sinonasal tumors, Inverted papilloma, Squamous cell carcinoma, Histopathology.

INTRODUCTION

Sino-nasal tumors represent a diverse group of neoplasms originating in the nasal cavity and paranasal sinuses, encompassing both benign and malignant entities. Although rare, sino-nasal tumors account for a small but significant subset of head and neck neoplasms, with approximately 3% of head and neck cancers being sino-nasal malignancies¹. They exhibit remarkable histological diversity and the distinction between benign and malignant sino-nasal tumors is clinically crucial, as these two categories display distinct biological behaviors, clinical manifestations, and prognostic implications². Early detection and accurate histopathological classification are essential for effective treatment planning and prognostication. This study aims to study the clinico-pathological profile in a tertiary care center of Rajasthan, India.

MATERIAL AND METHODS

This retrospective descriptive study was conducted during the period from January, 2021 to December, 2025, in collaboration with the Department of Pathology and Otorhinolaryngology, S.K. Medical College, Sikar (Rajasthan) after the approval from Institutional Ethics Committee. All sinonasal tumor cases, histo-pathologically confirmed at pathology

lab were included under the study. Inflammatory and non-neoplastic lesions were excluded from the study. All specimens were processed routinely and examined on hematoxylin and eosin stained sections.

RESULTS

Figure1: Majority of the cases belonged to age group of 41-60 years (39%). It was followed by age group of 21-40 years (26%), age group of >60 years (25%) of age and age group of <20 years (8 %) of age. Male: female ratio was 1.8:1. Cases of Benign neoplastic masses were (58.5%) and malignant neoplastic masses were (41.5%). Symptom wise most common symptom was nasal obstruction in 78% cases. Out of the neoplastic masses, inverted papilloma (40.96%) was found to be the most common benign lesion followed by angiofibroma, hemangioma, osteoma, fibrous dysplasia and schwannoma. Few cases (41.5%) of malignant neoplastic mass were also seen almost half of which were squamous cell carcinoma. Few cases of Adenocarcinoma, sino-nasal undifferentiated carcinoma, lymphoma and malignant melanoma were also recorded.

Table 1: Age – wise distribution of cases

Age (years)	Cases	Percentage (%)
<20	12	8.45%
21–40	38	26.76%
41–60	56	39.44%
>60	36	25.35%
Total	142	100%

Table 2: Gender – wise distribution of cases

Gender	No. of cases	Percentage (%)
Male	91	64.08%
Female	51	35.91%
Total	142	100%
M:F Ratio	1.8:1	

Table 3: Presenting complaints among Sino-nasal mass

Symptom	Percentage (%)
Nasal obstruction	78
Epistaxis	52
Facial pain/swelling	41
Proptosis	18

Table 4: Distribution of malignancy in sinonasal tumors, (n=142).

Distribution	Total cases	Percentage (%)
Benign	83	58.5%
Malignant	59	41.5%
Total	142	100%

Table 5: Distribution of benign neoplastic mass

Benign neoplastic mass	No. of cases (total 83)	Percentage (%)
Inverted papilloma	34	40.96
Angiofibroma	25	30.12
Hemangioma	10	12.04
Osteoma	8	9.63
Fibrous dysplasia	4	4.81
Schwannoma	2	2.41

Table 6: Distribution of malignant neoplastic mass

Neoplastic mass	No. of cases (total 59)	Percentage (%)
Squamous cell carcinoma	27	45.8
Adenocarcinoma	11	18.6
Sinonasal undifferentiated carcinoma	9	15.3
Lymphoma	7	11.9
Malignant melanoma	5	8.4

DISCUSSION

Tumors of the nose and paranasal sinuses have a significant impact on the patient's functional and structural aspects. They affect all age groups and both sexes. Due to its proximity to vital structures, tumors of the nose and paranasal sinuses sometimes lead to very grave prognoses³. These tumors tend to become more prevalent with age, likely due to accumulated exposure to environmental and occupational risk factors⁴. Studies show that sinonasal malignancies, in particular, are more commonly diagnosed in the fifth and sixth decades of life, which could be attributed to prolonged exposure to carcinogenic materials over time^{5,6}.

The sex distribution in this study demonstrates a marked male predominance, with males constituting 64.08 % of the cohort and a male-to-female ratio of 1.8:1. In many regions, lifestyle factors such as smoking, which is more prevalent among men, may also contribute to this disparity in sino-nasal tumor incidence⁷. The study reveals that benign tumors far outnumber malignant ones, with 58.50 % of cases being benign notably, inverted papillomas angiofibroma and haemangiomas⁸. Among the malignant cases, SCC is the most frequent, comprising 45.8 % of malignant tumors. SCC is widely recognized as the most common malignancy of the sino-nasal tract, often associated with risk factors such as smoking, chemical exposure, and certain viral infections⁹.

Advanced presentation is common in sino-nasal malignancies due to the asymptomatic nature of early-stage disease and the anatomical complexity of the sinuses, which can delay diagnosis until significant local spread has occurred¹⁰. The most prevalent clinical symptom reported was nasal obstruction (78%), followed by epistaxis (52%), which are characteristic symptoms of sino-nasal tumors. Nasal obstruction, in particular, is often the first noticeable symptom, as tumor growth in the confined space of the nasal cavity and sinuses can quickly impair airflow¹¹. However, non-specific symptoms such as nasal discharge and headaches can mimic less severe conditions like chronic sinusitis, contributing to delayed diagnosis¹².

Given the diverse clinical presentations and significant diagnostic challenges, sino-nasal tumors require a multidisciplinary approach for effective management. The high proportion of benign tumors suggests that conservative treatment options, including surgical resection for symptomatic relief, may be sufficient for most patients. However, careful histopathological evaluation is essential to differentiate benign lesions from low-grade malignancies, particularly in cases of inverted papillomas or fibrous dysplasia, which have the potential for malignant transformation. For malignant cases, particularly SCC, treatment typically involves a combination of surgical resection, radiotherapy, and sometimes chemotherapy, depending on the tumor's extent and staging¹³.

CONCLUSION

Sinonasal mass having wide spectrum from benign to malignant, affects people of all ages. Early diagnosis, prompt treatment and regular follow-up comprise its management protocol. Besides we should consider identifying the etiological factors necessary to control its prevalence and decrease mortality. However, radiological imaging, histopathological examination and clinical assessment of all should be considered during evaluation of patients with such complaints such as nasal obstruction, epistaxis, hyposmia, diplopia and external maxillofacial deformity. Association between its clinical, histopathological, radiological findings helps in diagnosis, early detection and treatment.

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