International Journal of Otorhinolaryngology and Head and Neck Surgery
Haque MM et al. Int J Otorhinolaryngol Head Neck Surg. 2025 Jun;11(3):196-200
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937
DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20251496

Original Research Article

Clinicopathological patterns of benign and malignant sino-nasal tumours: insights from a single-center study

Muhammad Mahmudul Haque*, M. Khaled Shahrear, Ashik Ikbal

Department of ENT, Rajshahi Medical College, Rajshahi, Bangladesh

Received: 12 November 2024
Revised: 13 April 2025
Accepted: 17 April 2025

***Correspondence:**
Dr. Muhammad Mahmudul Haque,
E-mail: dranikent@gmail.com

ABSTRACT

Background: Sino-nasal tumors, arising from the nasal cavity and sinuses, can be benign or malignant. Due to nonspecific symptoms and complex anatomy, diagnosis is often delayed. This study explores their prevalence, types, and distribution.
Methods: This cross-sectional observational study was conducted at the ENT and head-neck surgery department, Rajshahi medical college hospital, Rajshahi, from June 2014 to November 2014. A total of 60 patients presenting with sinonasal tumors were selected as study subjects by purposive sampling technique. Data analysis was done by statistical package for social sciences (SPSS) version 20.0. A descriptive method was adopted.
Results: This study on sino-nasal tumors found that 93.33% (56 out of 60) of the cases are benign, while only 6.67% (4 cases) are malignant. The maxillary antrum is the most affected site for malignancies (100%), followed by the nasal cavity (75%) and ethmoidal sinuses (25%). Among the malignant cases, 75% are classified as T4, indicating extensive disease. The most common benign tumors are haemangioma and rhinosporidiosis, each comprising 28.5% of benign cases. Squamous cell carcinoma (SCC) is the predominant malignant type, accounting for 75% of malignant tumors, highlighting the overall prevalence of benign lesions in the sinonasal region.
Conclusions: This study highlights that benign sino-nasal tumors, especially haemangiomas and rhinosporidiosis, are more common, while SCC is the leading malignancy. Malignant cases often present late, mainly affect the maxillary antrum, and cause symptoms like nasal obstruction and facial pain.

Keywords: Clinicopathological patterns, Malignant sino-nasal tumours, Maxillary antrum, Hemangioma

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 malignancies.[1] Their anatomical complexity and proximity to critical structures such as the eyes, skull base, and cranial nerves pose considerable challenges in diagnosis, treatment, and prognosis.[2] The distinction between benign and malignant sino-nasal tumors is clinically crucial, as these two categories display distinct biological behaviors, clinical manifestations, and prognostic implications.[3] Benign sino-nasal tumors, which are more frequently encountered, include entities such as nasal polyps, inverted papillomas, and hemangiomas. While these lesions are generally non-invasive, certain benign tumors, like inverted papillomas, are locally aggressive and have a known malignant transformation potential.[4] For instance, inverted papillomas, despite being benign, have an estimated risk of malignant transformation into SCC in 5-15% of cases.[5] Malignant sino-nasal tumors are less common but considerably more aggressive. The most frequent

malignant histologic types include SCC, adenocarcinoma, and sinonasal undifferentiated carcinoma (SNUC), each with distinct pathological and clinical profiles.[6] Advanced malignancies may also present with symptoms related to local invasion, such as visual disturbances, proptosis, and cranial neuropathies.[7] According to Tran et al., these secondary symptoms often indicate advanced disease and correlate with poorer survival outcomes, especially in high-grade malignancies such as SNUC.[8] Diagnostic evaluation of sino-nasal tumors involves a combination of imaging, histopathology, and endoscopic examination. Imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) provide critical insights into the tumor's extent, its relationship with surrounding structures, and potential signs of malignancy. Molecular pathology is an emerging area of research, particularly in malignant tumors like sinonasal adenocarcinoma and SNUC, where molecular markers provide valuable insights into tumorigenesis, potential treatment targets, and prognostic indicators.[9] In cases of benign tumors with malignant potential, such as inverted papillomas, careful long-term surveillance is recommended to detect early malignant transformation. In contrast, malignant sino-nasal tumors require a multimodal treatment approach involving surgery, radiation, and in some cases, chemotherapy, especially for high-grade lesions or those with extensive local invasion. Studies have shown that complete surgical resection followed by radiation therapy significantly improves outcomes in patients with SCC and adenocarcinoma, although survival remains low for aggressive types like SNUC.[10] This study aimed to analyze clinicopathological patterns of benign and malignant sino-nasal tumors.

METHODS

This cross-sectional observational study was conducted at the ENT and head-neck surgery department, Rajshahi medical college hospital, Rajshahi, from June 2014 to November 2014. All patients with Sino-nasal Tumours attending in indoor department of ENT and head neck surgery of Rajshahi medical college hospital, Rajshahi were considered as the study population. A total of 60 patients were selected as study subjects by purposive sampling technique. Detailed history taking and general examinations and ear, nose and throat examinations were done and recorded in a data collection sheet by the investigator. The diagnosis was based on history taking, thorough examination (both general and systemic), and histopathological examination.

The nature of the study was fully explained to each guardian and written informed consent was obtained before their enrollment in the study. Data analysis was done by SPSS version 20.0. A descriptive method was adopted. After analysis data were presented in tables. Ethical clearance was obtained from the ethics committee of Rajshahi medical college hospital.

Inclusion criteria

Sino-nasal tumors of any age and any sex group and patients who were willing to participate in the study were included.

Exclusion criteria

Sino-nasal mass with histological proof of benign nonneoplastic condition and patients who did not give consent to participate in the study were excluded.

RESULTS

The age distribution table shows that out of 60 patients, the highest percentage of cases falls within the age groups 21-30 years and 51-60 years, each representing 20% of the total. This is followed by the 41-50 years group, comprising 16.67% of patients. The 11-20 and 31-40 years age groups each account for 13.33%, while the 61-70 years group makes up 10%, and the 0-10 years group is the smallest, with 6.67% (Table 1).

Table 1: Age distribution of the patients (n=60).

Age (in years)	N	Percentage (%)
0-10	4	6.67
11-20	8	13.33
21-30	12	20.00
31-40	8	13.33
41-50	10	16.67
51-60	12	20.00
61-70	6	10.00

The sex distribution table reveals that among the 60 patients studied, a significant majority are male, with 46 cases representing 76.67% of the total. Female patients make up the remaining 23.33%, with 14 cases. In this study male to female ratio was 3.3:1 (Table 2).

Table 2: Sex distribution of patients, (n=60).

Sex	N	Percentage (%)
Male	46	76.67
Female	14	23.33

Table 3: Distribution of malignancy in sinonasal tumors, (n=60).

Distribution	N	Percentage (%)
Malignant	04	6.67
Benign	56	93.33

The distribution of malignancy in sinonasal tumors shows that out of 60 cases, the vast majority are benign, with 56 cases accounting for 93.33% of the total. Malignant cases are relatively rare, comprising only 4 cases or 6.67% (Table 3).

Table 4: Topographic distribution of sino-nasal malignancy (n=4).

Site	N	Percentage (%)
Maxillary antrum	04	100.0
Nasal cavity	03	75.0
Ethmoidal sinuses	01	25.0

The maxillary antrum is the most commonly affected site, with all 4 patients (100%) exhibiting malignancies in this area. The nasal cavity is also frequently involved, with 3 patients (75%) having tumors located there. Additionally, 1 patient (25%) has malignancy in the ethmoidal sinuses (Table 4).

Table 5: Distribution of patients according to tumor size, (n=4).

Size	N	Percentage (%)
T_4	03	75.0
T_3	01	25.0

Three patients (75%) are classified as having T4 tumors, which typically represent more extensive disease with local invasion. In contrast, only 1 patient (25%) has a T3 tumor, indicating a lesser degree of local spread (Table 5).

Table 6: Types of benign sino-nasal tumor, (n=56).

Types	N	Percentage (%)
Haemangioma	16	28.5
Angiofibroma	6	11.0
Inverted papilloma	6	11.0
Benign fibrous histiocytoma	3	5.3
Fibrous dysplasia	3	5.3
Dentigerous cyst	6	11.0
Rhinosporiodosis	16	28.5

The most common types are haemangioma and rhinosporidiosis, each observed in 16 patients, representing 28.5% of the cases. Angiofibroma, inverted papilloma, and dentigerous cysts each account for 11% (6 patients each), indicating a notable prevalence of these tumors as well. Additionally, benign fibrous histiocytoma and fibrous dysplasia are reported in 3 patients each, constituting 5.3% of the total (Table 6).

Table 7: Types of neoplastic sino-nasal tumor (n=4).

Types	N	Percentage (%)
SCC	03	75
Adenoid cystic carcinoma	01	25

In this study 3 patients (75%) are diagnosed with this type of cancer, reflecting its status as the most common malignant tumor in this cohort. In contrast, adenoid cystic carcinoma is observed in 1 patient, accounting for 25% of the cases.

DISCUSSION

The age distribution reveals that the highest proportion of cases falls within the adult age brackets of 21-30 and 51-60 years, each accounting for 20% of the total sample. These tumors tend to become more prevalent with age, likely due to accumulated exposure to environmental and occupational risk factors.[11] 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.[12,13] The sex distribution in this study demonstrates a marked male predominance, with males constituting 76.67% of the cohort and a male-to-female ratio of 3.3:1. In many regions, lifestyle factors such as smoking, which is more prevalent among men, may also contribute to this disparity in sino-nasal tumor incidence.[14] The study reveals that benign tumors far outnumber malignant ones, with 93.33% of cases being benign. The predominance of benign tumors aligns with global epidemiological data, where non-malignant sino-nasal tumors, including haemangiomas, rhinosporidiosis, and inverted papillomas, are commonly reported.[15] Notably, haemangiomas and rhinosporidiosis each represent 28.5% of benign cases in this cohort, suggesting that vascular and infectious benign lesions are among the most frequent types. Rhinosporidiosis, in particular, is more prevalent in regions with specific environmental conditions, and its incidence may reflect the geographical and socio-cultural context of the study population.[16] Among the malignant cases, SCC is the most frequent, comprising 75% 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 infections.[17] All cases of malignancy in this study involved the maxillary antrum (100%), with three cases also involving the nasal cavity (75%) and one case extending to the ethmoidal sinuses (25%). The maxillary antrum's vulnerability may be due to its anatomical structure, which allows for the accumulation of carcinogens and pathogens from inhaled air.[18] Tumor staging revealed that most malignant cases were advanced, with 75% classified as T4 tumors, reflecting extensive local invasion. 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 occurred.[19] The most prevalent clinical symptom reported was nasal obstruction (93.33%), followed by loss of smell (70%) and epistaxis (50%), which are characteristic symptoms of sino-nasal tumors.[20] 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 airflow. However, non-specific symptoms such as nasal discharge and headaches can mimic less severe conditions like chronic sinusitis, contributing to delayed diagnosis.[21] 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.[22] For malignant cases, particularly SCC, treatment typically involves a combination of surgical resection, radiotherapy, and sometimes chemotherapy, depending on the tumor's extent and staging. Given the high proportion of T4 tumors observed, advanced-stage malignancies often necessitate complex surgeries that may require reconstruction and carry a risk of significant morbidity.[23]

Limitations

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study on the clinicopathological patterns of benign and malignant sino-nasal tumors underscores the predominance of benign lesions, with haemangiomas and rhinosporidiosis being the most common, while SCC represents the primary malignancy. Malignant tumors frequently presented at advanced stages, often involving the maxillary antrum, and were associated with challenging symptoms such as nasal obstruction and facial pain.

Recommendations

To address the clinicopathological patterns of benign and malignant sino-nasal tumors effectively, we recommend implementing structured screening protocols and awareness programs tailored to high-risk populations. Increased emphasis on early identification of symptoms, along with improved occupational health measures, can help mitigate the progression of these tumors.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Thompson LD, Franchi A. New tumor entities in the 4th edition of the World Health Organization classification of head and neck tumors: Nasal cavity, paranasal sinuses, and skull base. Virchows Arch. 2018;472:315-30.
2. Dulguerov P, Jacobsen MS, Allal AS, Lehmann W, Calcaterra T. Nasal and paranasal sinus carcinoma: are we making progress? A series of 220 patients and a systematic review. Cancer. 2001;92(12):3012-29.
3. Turner JH, Reh DD. Incidence and survival in patients with sinonasal cancer: a historical analysis of population-based data. Head Neck. 2012;34(6):877-85.
4. Barnes L. Pathology and genetics of head and neck tumors. IARC. 2005.
5. Franchi A, Miligi L, Palomba A, Giovannetti L, Santucci M. Sinonasal carcinomas: recent advances in molecular and phenotypic characterization and their clinical implications. Crit Rev Oncol/Hematol. 2011;79(3):265-77.
6. Dutta R, Dubal PM, Svider PF, Liu JK, Baredes S, Eloy JA. Sinonasal malignancies: a population-based analysis of site-specific incidence and survival. The Laryngoscope. 2015;125(11):2491-7.
7. Cantù G, Bimbi G, Miceli R, Mariani L, Colombo S, Riccio S, et al. Lymph node metastases in malignant tumors of the paranasal sinuses: prognostic value and treatment. Arch Otolaryngol Head Neck Surg. 2008;134(2):170-7.
8. Kowalski LP. Classification and prevalence. Future Medicine Ltd. 2013.
9. Llorente JL, López F, Suárez C, Hermsen MA. Sinonasal carcinoma: clinical, pathological, genetic and therapeutic advances. Nature Rev Clin Oncol. 2014;11(8):460-72.
10. Thompson LD, Penner C, Ho NJ, Foss RD, Miettinen M, Wieneke JA, et al. Sinonasal tract and nasopharyngeal adenoid cystic carcinoma: a clinicopathologic and immunophenotypic study of 86 cases. Head Neck Pathol. 2014;8:88-109.
11. Caruntu A, Scheau C, Tampa M, Georgescu SR, Caruntu C, Tanase C. Complex interaction among immune, inflammatory, and carcinogenic mechanisms in the head and neck squamous cell carcinoma. InBest Practice in Health Care Cham: Springer International Publishing.. 2021;11-35.
12. Vedanthan PK, Nelson HS, Agashe SN, Mahesh PA, Katial R. Textbook of Allergy for the Clinician. CRC Press, Taylor and Francis Group. 2014.
13. Miligi L, Buzzoni C, Piro S. Epidemiology of sinonasal cancer in book Pathology of sinonasal tumors and tumor-like lesions. 2020;3-17.
14. Binazzi A, di Marzio D, Mensi C, Consonni D, Miligi L, Piro S, et al. Gender Differences in Sinonasal Cancer Incidence: Data from the Italian Registry. Cancers. 202429;16(11):2053.
15. Rivas-Rodriguez F, Capizzano AA. Imaging of the Sinonasal Cavities. Dental Clin. 2024;68(2):337-55.
16. Swain SK. Human rhinosporidiosis: Still an elusive disease. Int J Otorhinolaryngol Head Neck Surg. 2020;6:1747-52.
17. Elgart K, Faden DL. Sinonasal squamous cell carcinoma: etiology, pathogenesis, and the role of human papillomavirus. Curr Otorhinolaryngol Rep. 2020;8:111-9.

18. Sharma D, Sharma N, Sharma V. Sinonasal cancers: diagnosis and management. London, UK: IntechOpen. 2019.
19. Rutkowska M, Hnitecka S, Dominiak M. Sinonasal malignancies-clinico-pathological characteristics and difficulties in diagnostics. Advances in biomedical research-from cancer prevention to treatment. Edited by: Bialy L, Mlynarczuk-Bialy I. Lubin: Wydawnictwo Naukowe Tygiel. 2020;143-56.
20. Eggesbø HB. Imaging of sinonasal tumours. Cancer Imaging. 2012;12:136.
21. Li Z, Wang X, Jiang H, Qu X, Wang C, Chen X, et al. Chronic invasive fungal rhinosinusitis vs sinonasal squamous cell carcinoma: the differentiating value of MRI. European Radiol. 2020;30:4466-74.
22. Harris A, Andl T. Precancerous lesions of the head and neck region and their stromal aberrations: piecemeal data. Cancers. 2023;15(8):2192.
23. Bussu F, Tagliaferri L, Corbisiero MF, Lotto C, Pellini R, Guarino P, et al. Management of nasal vestibule carcinomas: recommendations by the Oncological Committee of the Italian Society of Otorhinolaryngology-Head and Neck Surgery. Acta Otorhinolaryngologica Italica. 2024;44(1):13.

Cite this article as: Haque MM, Shahrear MK, Ikbal A. Clinicopathological patterns of benign and malignant sino-nasal tumours: insights from a single-center study. Int J Otorhinolaryngol Head Neck Surg 2025;11:196-200.