Journal of Pathology of Nepal (2023) Vol. **13**, 1987 - 1992

Journal of
PATHOLOGY
of Nepal
www.acpnepal.com

Original Article

Clinicopathological study of sinonasal lesions-5 years study in a rural hospital

Savita Dongapure[1], Anand Anatharao Shankar[1], Raja Parthiban SR[2]

[1]*Department of Pathology, MVJ Medical College & Research Hospital, Bengaluru, India*
[2]*Department of Pathology, Navodaya Medical College Raichur, India*

Keywords:

Histopathology;
Neoplastic lesions;
Non-neoplastic;
Sinonasal mass;

ABSTRACT

Background: Sinonasal lesions of both non-neoplastic and neoplastic variants are frequently observed by clinicians in the nasal cavity and paranasal sinuses. Sinonasal lesions are important due to divergence in their behavior and prognosis. Hence, a careful histological workup remains the mainstay of a final definitive diagnosis and timely intervention.

Materials and Methods: A prospective analysis was done on 151 patients of Sinonasal masses who presented to the Department of Otorhinolaryngology, MVJ Medical College and Hospital, from 2014 to 2019.Their biodata, clinical profile, and histopathological diagnosis were analyzed.

Results: Non-neoplastic lesions (135 cases, 89.4%) were more frequent than neoplastic lesions (16 cases, 10.59%), and showed male predominance with an M: F ratio of 1.7:1. Nasal polyp (119 cases, 88%) was the most common lesion. Nasal obstruction (89 cases 89.45%) was the most common presenting feature. Among the neoplastic lesions, lobular capillary hemangioma was the most common benign lesion (2 cases,50%), and squamous cell carcinoma 2 cases (18.1%),was the most common malignant lesion.

Conclusions: Sinonasal masses can present with overlapping clinical features, hence, it is important to categorize them into the non-neoplastic and neoplastic lesions for further management. Histopathology remains the gold standard for establishing the diagnosis in such cases.

Correspondence:
Dr. Raja Parthibhan, Professor and HOD,
Department of Pathology
MVJ Medical College & Research Hospital, Bengaluru, India
ORCID ID:0000-0002-6707-1466
E-mail: Indianpathology@gmail.com

Received : March 10, 2023; **Accepted :** March 19, 2023

Citation: Dongapure S, Shankar AA, Parthibhan R. Clinicopathological Study of Sinonasal Lesions-5 Years Study in a Rural Hospital Setup. J Pathol Nep 2023;13(1):1987-92. DOI:10.3126/jpn.v13i1.53143

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DOI : 10.3126/jpn.v13i1.53143

INTRODUCTION

Avariety of non-neoplastic and neoplastic conditions involve the nasal cavity, paranasal sinuses, and nasopharynx and are frequent lesions observed by clinicians.[1] A large number of diseases affecting these structures are due, in major part, to many of the specialized tissues, each with its aberrations that exist in the region.[1-3] Nasal obstruction, nasal discharge, and epistaxis due to lesions in the sinonasal region are some of the classical symptoms encountered in clinical practice.[4] The presenting clinical features and symptomatology and advanced imaging techniques, only help to reach a

presumptive diagnosis. Hence, a careful histological workup remains the mainstay of the final definitive diagnosis and helps in timely intervention.[2-5] Hence, an attempt was made to study the age and sex distribution and the clinical presentation of the sinonasal lesions in this part of the rural population.

The study aims to examine the occurrence of various sinonasal lesions and to categorize them into non-neoplastic and neoplastic lesion nd to determine the age, sex-wise incidence, and to correlate the clinical and histopathological findings of sinonasal lesions in the rural population.

MATERIALS AND METHODS

A prospective study of 151 cases from the period 2014-2019, of all the biopsied and surgically resected sinonasal masses who presented to the Department of Otorhinolaryngology, and other attached peripheral centers to MVJ Medical College. Demographic data regarding age, sex, chief complaints, clinical examination, and radiological investigations were retrieved from histopathology forms and OPD records.

All the biopsy and resected specimens from the sinonasal tract during the study period were included in the study. However, lesions of external nose and nasopharynx and previously treated and recurrent cases were excluded. The samples were fixed in 10% formalin. Specimens were cut open for gross morphological study, and after routine processing, tissues were embedded in paraffin wax, and 5-micron thickness sections were cut. These sections were routinely stained with Haematoxylin and Eosin to establish the diagnosis. Special stains were used in selected cases. The clinical and histopathological data from 151 cases were analyzed. The lesions were classified according to WHO classification 2017[6] as non-neoplastic and neoplastic lesions.

RESULTS

A total of 151 cases presented as sinonasal lesions over 5 year period are included in the present study. The lesions were categorized as non-neoplastic and neoplastic lesions (benign and malignant).135 cases (89.40%) were non-neoplastic and 16 cases (10.59%) were neoplastic lesions. We recorded a higher percentage of non-neoplastic lesions than neoplastic lesions in a ratio of 8:1. Among neoplastic lesions, 12 cases (75.0%) of benign lesions exceeded the malignant 4 cases (25.0%) lesions.

The majority of the non-neoplastic lesions presented in the 2nd and 3rd decades and neoplastic in the 4th and 5th decades as shown in table 1. Sinonasal lesions had a strong affinity for males as compared to females with M: F ratio of 1.7:1. Clinical examination revealed out of 151cases, a majority of 135 (89.4%) cases presented with nasal obstruction followed by 115 (76.1%) cases with nasal discharge. (Table 2)

Table 1: Age-wise distribution of lesions

Age Group (years)	Non-neoplastic	Neoplastic		No of cases (%)
		Benign	Malignant	
0-10	0 4	02	00	06 (3.9)
11-20	37	01	00	37 (24.5)
21-30	56	02	00	56 (37.08)
31-40	26	05	00	29 (19.2)
41-50	14	02	03	19 (12.58)
51-60	02	00	01	03 (1.98)
61-70	01	00	00	01 (0.66)
Total	**140**	**07**	**04**	**151 (100)**

Table 2: Clinical presentations of sinonasal lesions

Mode of Presentation	No of cases	Percentage
Nasal obstruction	135	89.4%
Nasal discharge	115	76.1%
Sneezing	67	44.3%
Epistaxis	12	7.94%
Headache	38	25.1%
Anosmia/hyposmia	15	9.93%
Facial swelling	11	7.28%
Deformity of nasal pyramid	**7**	**4.63%**

Among non-neoplastic lesions, a nasal polyp was the most recurrent lesion comprising 119 cases (88.1%)(Table 3). Hemangioma was the most common benign lesion and squamous cell carcinoma 2 cases (18.1%), presented as the most common malignant lesion in our study as shown in Table 4.

Table 3: Spectrum of non-neoplastic lesions

Histopathological diagnosis	No of cases	Percentage (%)
Inflammatory polyps	81	60.0%
Allergic polyps (fig.1)	38	28.14%
Rhinoscleroma	01	0.74%
Rhinosporidiosis (fig.2)	04	2.22%
Fungal Rhinosinusitis (fig. 3)	06	4.44%
Mucocele	03	2.22%
Lepromatous leprosy	01	0.74%
Nasal glioma	01	0.74%
Total	**135**	**100%**

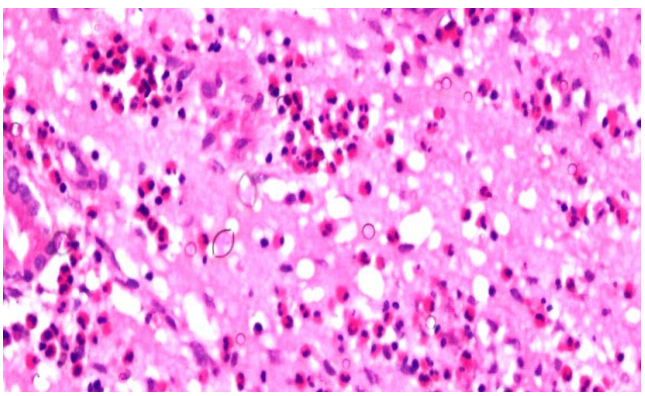

Figure 1: *Allergic polyp (H&E stain, 400X)*

DOI : 10.3126/jpn.v13i1.53143

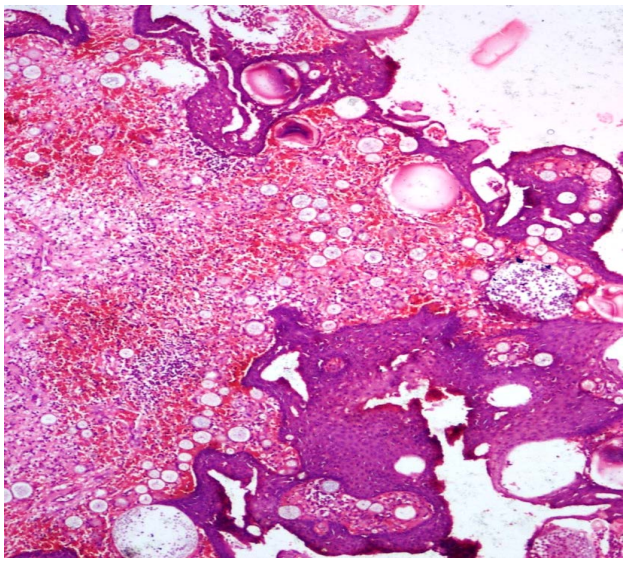

Figure 2: *Rhinosporodiosis multiple sporangia with spores (H & E stain, 100X)*

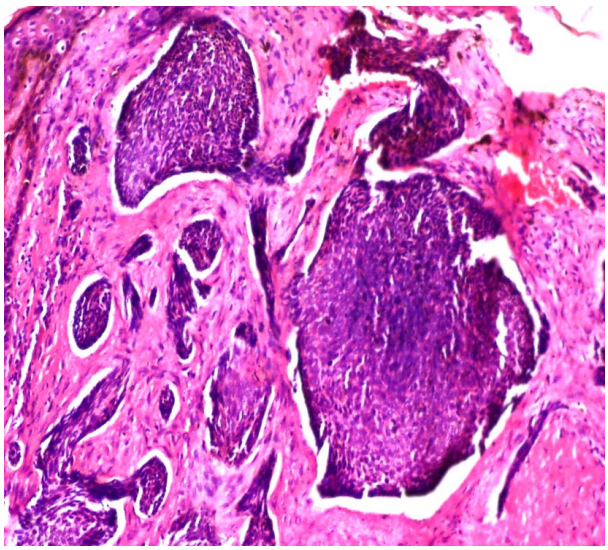

Figure 3: *Mucormycosis (H & E stain, 400X)*

Table 4: Spectrum of neoplastic sinonasal lesions

	Histopathological diagnosis	No of cases (%)
Benign Lesions	Lobular capillary haemangioma	06 (37.5)
	Inverted papilloma	04 (25.0)
	Angiofibroma	01 (6.25)
	Solitary Nasal fibroma	01(6.25)
Malignant Lesions	Squamous cell carcinoma	02 (12.5)
	Sinonasal undifferentiated carcinoma (fig. 4)	01(6.25)
	Non-Hodgkin's lymphoma	01(6.25)
Total		**16 (100)**

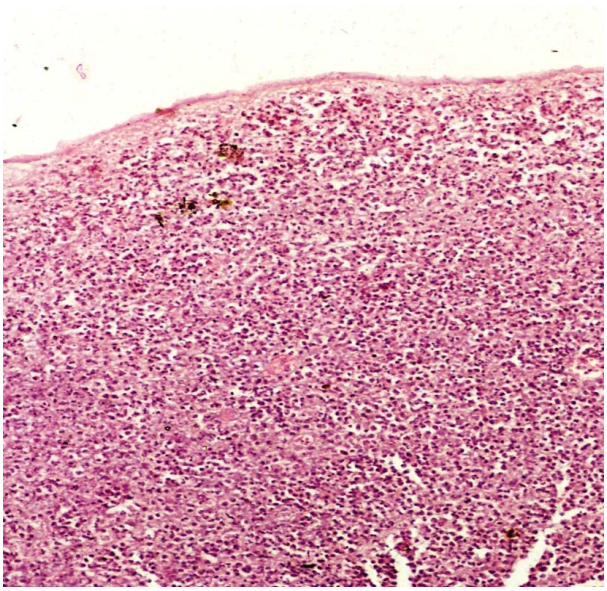

Figure 4: *Sinonasal undifferentiated carcinoma (H and E stain, 10X)*

DISCUSSION

A total of 151 sinonasal lesions were examined based on histopathological features classified as non-neoplastic and neoplastic lesions. In the present study, we recorded a higher percentage of non-neoplastic lesions in 135 cases (89.1%), as compared to neoplastic lesions in 16 cases (10.59%),similar results were observed in studies done by Lathi A et al[7], Humayun et al[8], Garg D et al.[9] (72%,71.4%,73.6%),respectively of non-neoplastic lesions and (28%, 28.6%, 26.4%,28%) respectively as neoplastic lesions, A study done by Dasgupta et al[10] observed an almost equal proportion of non-neoplastic and neoplastic lesions.

Sinonasal lesions presented in a wide age range of 2 to 68 years, Maximum cases were distributed in the 2nd-5th decade of life, and the majority 37.08% of cases mainly belonged to the 21-30 years, age group. Non-neoplastic lesions were more frequent in the 2nd and 3rd decades (26.42%, 40%,) and neoplastic lesions were common in the 5th decade (31.25%). Our study is in congruence with several previous studies done by Zafar et al,[2] Lathi et al[7], and Bakari et al[11], which observed peak incidence of the non-neoplastic lesion in the 2nd-4th decade and the majority of neoplastic lesions from the 5th decade onwards.

A higher predilection for males was observed in the present study with male to female ratio of 1.7:1, similar observations were done by Kulkarni et al[12] (M: F=2.25:1),Dasgupta et al[10] (M: F=1.9:1),Lathi et al[7] (M: F=1.3:1), of male preponderance, However, a study done by Parajuli et al[13] reported female predominance with an (M: F=1:1.31).

The most common presenting symptoms in the present study were nasal obstruction (135 cases, 89.4%,) followed by nasal discharge (115 cases,76.1%). Studies conducted by

DOI : 10.3126/jpn.v13i1.53143

Humayun et al[8] (100%), Maheshwari A et al[14](88%), and Mane et al[15] (84.7%), also depicted nasal obstruction as the most common presenting symptom, followed by nasal discharge comprising 83%,72% and 55.2% respectively in the studies.

Among the spectrum of non-neoplastic lesions nasal polyps (89.25%) were the most recurrent lesion and next to polyps were fungal rhinosinusitis (3.70%), our study is by the studies done by Kulkarni et al[12], Maheshwari et al[14], Mane et al[15],who observed similar findings, and inconsistent with Agarwal et al[16] in 2017 who observed rhinosporidiosis(20.9%) as the most common lesion, second most common lesion was a nasal polyp. Nair S et al[17] studies based on clinical findings observed cases of Sinusitis were more common than nasal polyps.

Among all the sinonasal lesions studied, we reported a higher frequency of nasal polyps, with (78.09%) cases, similar findings of a high incidence of nasal polyps were reported by Garg et al[9] (89.5%), Parajuli et al[13] (89%), Lathi et al[7] (87.5%). A study done by Agrawal et al[16] recorded a lower incidence (27.4%) of nasal polyps in comparison to the observation of previous authors.

Maximum number of nasal polyps were seen in 2nd and 3rd decades of life with male predominance M: F=1.7:1, nasal obstruction is the most common symptom followed by nasal discharge is comparable to studies of Zafar et al[2], Lathi et al[7], Kulkarni et al[12], who reported peak incidence in 2nd and 3rd decades with male predominance and similar clinical features. A study by Vartak et al[18]observed the majority of cases in the 3rd -5th decade with male predominance M: F2:1. However Parajuli et al[13] reported a similar peak incidence in the 2nd-3rd decade with a female preponderance with M: F= 1:1.31.

A total of 119 cases of nasal polyps were reported in the present study we categorized them as inflammatory and allergic polyps, the number of inflammatory polyps (60.60%), was higher than the allergic polyps (28.14%), and these findings were consistent with the study done by Jaison and Tekwani et al[19] where the incidence of inflammatory polyps was higher (56%), than the allergic polyps (44%). A study done by Vartak et al[18] reported an incidence of (64.2%) inflammatory polyps similar to our study and a lower incidence of (4.21%) allergic polyps, compared to all the previous studies noted. This could be due to the sample size and geographical variation of the studies.

We reported 6 cases (3.97%), of fungal rhinosinusitis cases in the present study, and the mean age of presentation, was 49.3%, with male predominance, our study had a good correlation with a study done by Mane et al[15] and Montane et al[20] reported an almost similar mean age group, of 50.7yrs, 50yrs and with male-female ratios of 2:1, and 1.2:1 respectively. A study by Vartak et al[18] reported all the cases in males with variable age presentation from the 4th-7th decade.

On further classification, we noted a high percentage (83.3%) of non-invasive fungal sinusitis as compared to 16% of invasive fungal sinusitis, similar observations were done by Mane et al[15], and Vartak et al[18] who reported a higher number of (66.6%), (85.71%) respectively as non-invasive cases and (30%),(14.25%) as invasive fungal sinusitis. Aspergillosis was the commonest fungal infection with 5 cases, one case of mucormycosis was noted in an uncontrolled Diabetes Mellitus patient.

4 cases (2.2%) of Rhinosporidiosis were reported in the present study and were more common in the 3rd decade, showing male preponderance, with presenting symptoms like nasal obstruction and epistaxis. similar incidences were noted in the studies by Nayak et al[21] (1.82%) and Lathi et al[7] (2.5%).Abu H et al[22] reported a similar peak incidence in the 3rd decade of life. On the contrary, in the study conducted by Makannavar et al[23] these lesions were seen frequently seen in the 2nd and 4th decades of life. Most of the previous authors observed male predominance with similar presenting complaints as by the present study.[22,23]

Under neoplastic sinonasal lesions, we listed 12 cases (3.97%) of benign tumors majority of the cases were seen in the 4th decade of life. Parajuli et al[13]and Lathi et al[7] reported benign tumors commonly in the 5th decade. We reported male predominance with a male-to-female ratio of 1.4:1. which is comparable with the studies by Lathi et al[7] (1.7:1) and Jyothi Raj et al[24] (1.5:1). Nasal obstruction was the most common clinical feature (80%), followed by nasal discharge (53.3%) and epistaxis (53.3%), findings are in concordance with Humayun et al[8] who reported nasal obstruction as the most common symptom (66.7%) followed by nasal discharge (33.33%) and epistaxis (66.66%).

Among the benign lesions, lobular capillary hemangioma was the most common lesion with 6 cases (50%), Lathi et al[7] (8.03%). Maheshwari A et al[14] (8.75%), depicted similar results. In the present study, 4 cases were presented in the 4th decade and one case each in the 1st and 2nd decades with M: F=1:2, showing female predominance. These findings of peak incidence with female predilection complied well with the study done by Kulkarni et al[12] who reported the mean age of presentation as 32.4 years, (M: F=1:2). Khan et al[26] reported a higher incidence of 4cases (7.14%) of lobular capillary in the 4th decade with an equal sex ratio, on contrary Vartak et al[18] observed higher incidences in the 3rd-4th decade with male predominance (M: F= 1.75:1).

Out of 12 benign cases, haemangioma was the most frequent lesion with (50%) cases followed by inverted papilloma with 4 cases (33.3%) cases, similar to our study by Agrawal et al[16]also reported 43.6 % of haemangioma cases followed by inverted papilloma with 30.7 % cases, but Khan et al[26] reported 42.85% angiofibroma is the most common benign tumor followed by inverted papilloma(26.78 %). Inverted papilloma in our study presented in the 4th and 5th decade with M: F 3:1, findings are in corroboration with the studies

of Varthak et al[18], Mane et al[15], Khan et al[26], showed peak incidence in the 4th-5th decade with male predominance. Kulkarni et al[12] recorded 15.38% of inverted papilloma cases in the 4th decade with female predominance.

Malignant neoplasm of the sinonasal tract is rare; squamous cell carcinoma is considered to be the common histological type and is rarely encountered before the 4th decade of life. In our study maximum (1.98%) cases of malignant tumors occurred in the 5th decade and (0.66%) in the 6th decade. Mane et al[15] and Khan et al[26] reported maximum cases in the 6th and 7th decades. Malignant lesions showed male preponderance in our study with M: F=3:1, but JyotiRaj et al[24] (1:1.67) and Mane et al[15] (1:2) recorded female predominance.

Among the malignant neoplasms, squamous cell carcinoma was the most common malignant neoplasm with 2 cases (18.1%), in the 5th decade, which was seen predominantly in males. Studies conducted by Khan et al[26] (37.55) and Garg and Mathur et al[9] (46%), Kulkarni et al[25](66.66%) reported peak incidence a decade later in the 6th and 7th decade than the present study and showed higher predilection among males which is comparable to our study.

Sinonasal undifferentiated carcinoma (SNUC) is rare and aggressive neoplasm. we listed one case of undifferentiated carcinoma in 49-year females, Smith et al[27]reported 6 cases of SNUC in their study with a mean age of 44.7yrs showing male predominance. Parajuli et al[13] reported 30% of SNUC cases, from the 4th decade onwards, similar to our study.

A single case (0.66%) of Non-Hodgkin's lymphoma was reported in 54-year male, Vartak et al[18] in 2022 reported (7.14%) of lymphoma cases, the majority of cases occurred in the 2nd and 4th decade of life. However, Khan et al[26] reported peak incidence in 1st decade of life. Studies by Varthak et al[18] and Khan et al[26] showed equal sex distribution of lymphoma cases.

CONCLUSIONS

Sinonasal lesions were common in the younger age group with male preponderance. Hemangioma was the common benign lesion that showed female preponderance. Squamous cell carcinoma was a common malignant lesion. As an accurate histopathologic diagnosis is essential for further management of benign and malignant nasal lesions, it is important to know the histopathological features of various types of sinonasal lesions and categorize them into the Non-neoplastic and Neoplastic categories, which reflect on the behavior of the lesions and helps in the management, clinical outcome, and prognosis of the disease.

Conflict of interest: None

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DOI : 10.3126/jpn.v13i1.53143