

Histopathological Analysis of Sinonasal and Nasopharyngeal Lesions- A Retrospective Study

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ABSTRACT

Introduction: Sinonasal and nasopharyngeal lesions is a common problem in the present environment with diagnostic and therapeutic dilemma. Majority of the lesions present clinically as polypoid masses. Histopathological examination of these lesions is essential for the definitive diagnosis because management and prognosis vary among different lesions.

Aim: To determine the incidence of various nasal lesions reported in a rural tertiary care hospital, and to compare these lesions in relation to demographic data of the patients.

Materials and Methods: This retrospective study was conducted on the specimens received at histopathology section from the ENT department of a tertiary care hospital from April 2018 to November 2021. The specimens were fixed in 10% formalin, processed and then stained with haematoxylin and eosin. Required data were obtained from the histopathology records.

Results: The present study was conducted on a total of 100 cases. Amongst these, 61 were males and 39 were females. An overall male predominance was noted. Maximum numbers of cases were diagnosed in the age group 31-40 years. Non neoplastic constituted N=86 cases (86%), neoplastic benign lesions constituting N=10 cases (10%) and malignant masses constituted N=04 cases (04%) of the total lesions in the present study. Inflammatory polyps were the most commonly diagnosed cases and few fungal rhinosinusitis in postCOVID-19 patients were noted in the present study. Inverted papillomas were predominant benign neoplastic lesions whereas nasopharyngeal carcinomas were noted as predominant malignant lesions.

Conclusion: Most of the sinonasal and nasopharyngeal lesions reported were non neoplastic and inflammatory polyp being most common. Malignant lesions were reported in advanced age of life.

Keywords: Fungal sinusitis, Histopathology, Inverted sinonasal papillomas, Nasal polyps, Nasopharynx, Nasopharyngeal carcinoma

INTRODUCTION

The nasal passage and the paranasal sinuses are together called as sinonasal area. Nasopharynx with sinonasal area constitutes the functional unit which is lined by stratified squamous epithelium, pseudo stratified columnar epithelium and intermediate (transitional) epithelium. The lining of this functional unit is involved in filtering, humidifying and adjusting temperature of inhaled air [1,2]. As a result of exposure to multiple factors like infective agents, mechanical, chemicals agents and antigens, a variety of non neoplastic and neoplastic lesions can be seen in the sinonasal and nasopharyngeal areas.

Most common complaint of these patients being the nasal obstruction, mass in the nose, epistaxis, rhinorrhoea, hyposmia and deformity of nose and face. Maximum numbers of cases are diagnosed in the age group of 31-40 years. In adults, the common cause of nasal obstruction is noted as polyps in the general population [3-5].

Majority of the sinonasal lesions present with similar symptoms. Among these inflammatory and allergic polyps being the most common sinonasal lesions. Benign lesions like sinonasal papillomas, angiofibromas are relatively common but malignant lesions are rare. The detailed history and clinical examination, a thorough histopathological evaluation is essential for timely diagnosis as management and prognosis vary among different lesions [4,6,7].

The present study was aimed to determine the incidence of various sinonasal lesions, and to compare these lesions in relation to demographic data of the patients.

MATERIALS AND METHODS

This retrospective study was carried out in the Pathology department of Katuri medical college and hospitals, a rural tertiary

care hospital in South India. A total of 100 specimens of nasal, paranasal sinuses and nasopharyngeal lesions received from April 2018 to November 2021 were included in the study. The study was conducted in January to February 2022. Ethical approval was obtained from the ethical committee of the medical college F.NO. IEC/KMCH/2022/24. All the cases in the study were from ENT department alone.

Inclusion criteria: Patients of all age groups presenting with mass in nasal, paranasal sinuses and nasopharynx that are medically untreatable cases and requiring surgical treatment.

Exclusion criteria: nasal lesions due to injury and meadically treatable lesion were excluded from the study. Biopsy specimens with autolytic changes were also excluded.

All the specimens received in the histopathological section were fixed in 10% formalin, processed, embedded in paraffin, sectioned at 3-5 μ and stained with haematoxylin and eosin. Special stain, Periodic acid Schiff was carried out for fungal demonstration wherever necessary. Histologically, the nasal masses were grouped as benign and malignant lesions.

STATISTICAL ANALYSIS

Data was analysed with Microsoft excel. Results were shown as numbers and percentages.

RESULTS

A retrospective study was done, collecting the details of sinonasal and nasopharyngeal lesions that has been reported in the period from April 2018 to November 2021 from the records.

A total of 100 cases of sinonasal and nasopharyngeal lesions were included in the study. Amongst these, 61 were males and 39 were females. An overall male predominance was noted with M:F=1.56:1 [Table/Fig-1]. Maximum numbers of cases were diagnosed in the age group 31-40 years, followed by 21-30 years age group. Maximum number of non neoplastic lesions were seen in 31-40 years age group. In neoplastic masses, most of the benign lesions were noted in third decade of life (6 out of 10 cases), whereas, majority of the malignant lesions were reported in 61-70 years age group (3 out of 4 cases) [Table/Fig-2].

Type of lesions	Male	Female	Total (n=100)
Non neoplastic	51 (59.3%)	35 (40.6%)	86
Neoplastic benign	7 (70%)	3 (30%)	10
Neoplastic malignant	3 (75%)	1 (25%)	04
Total	61 (61%)	39 (39%)	100

[Table/Fig-1]: Gender based distribution of lesions.

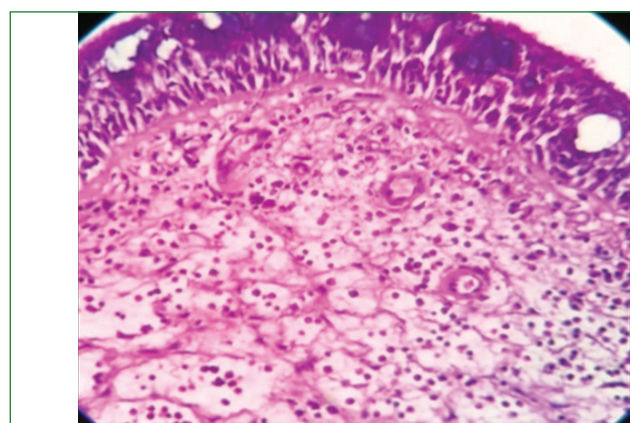
Age (yrs)	Non neoplastic	Neoplastic benign	Neoplastic malignant	Total (n=100)
<20	12 (92.3%)	1 (7.6%)	-	13
21-30	22 (95.65%)	1 (4.35%)	-	23
31-40	24 (80%)	6 (20%)	-	30
41-50	13 (92.8%)	1 (7.2%)	-	14
51-60	08 (80%)	1 (10%)	1 (10%)	10
61-70	06 (66.7%)	-	3 (33.33%)	09
>71	01 (100%)	-	-	01
Total	86 (86%)	10 (10%)	4 (04%)	100

[Table/Fig-2]: Age based distribution of lesions.

Among the non neoplastic lesions [Table/Fig-3], sinonasal polyp including inflammatory polyp [Table/Fig-4] and allergic polyp was the most common lesion reported with 64 cases (74.42%) followed by fungal rhinosinusitis with 10 (11.63%) cases.

Type of lesion	Histopathological diagnosis	No. of cases in males	No. of cases in females	Total (n=86)
Non neoplastic lesions	Sinonasal polyp (both inflammatory and allergic)	36 (56.25%)	28 (43.75%)	64
	Fungal rhino sinusitis	8 (80%)	02 (20%)	10
	Chronic non specific inflammation	4 (57.14%)	03 (42.86%)	07
	Granulomatous lesions	1 (33.33%)	02 (66.67%)	03
	Adenoid hypertrophy	02 (100%)	0 (0%)	02
	Total	51 (59.3%)	35 (40.7%)	86

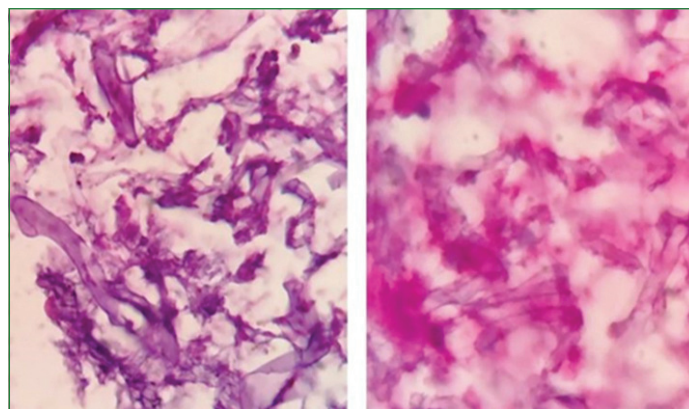
[Table/Fig-3]: Non neoplastic lesions and their gender based distribution.



[Table/Fig-4]: Photomicrograph of inflammatory sinonasal polyp showing pseudostratified columnar epithelium with mixed inflammatory cells in stroma (H&E Stain; 40x).

In this study, seven were diagnosed of fungal mucormycosis with broad non septate hyphae arranged irregularly on microscopy

[Table/Fig-5]. The age group of presentation was 31-40 years, with male predominance.

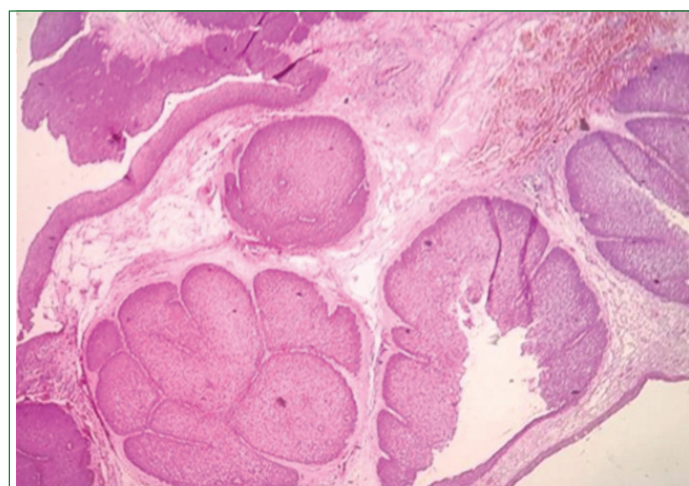


[Table/Fig-5]: Photomicrograph of fungal rhinosinusitis (H&E Stain; 40x and PAS stain).

Among neoplastic lesions (n=14), [Table/Fig-6], 8 cases of benign lesions were noted with inverted sinonasal papillomas [Table/Fig-7] as the most commonly diagnosed lesions.

Type of lesion	Histopathological diagnosis	No. of cases in males	No. of cases in females	Total (n=14)
Benign lesions	Inverted sinonasal papillomas	5 (62.5%)	3 (37.5%)	8
	Angiofibromas	2 (100%)	0	2
	Total	7 (70%)	3 (30%)	10
Malignant lesions	Sinonasal carcinoma	1 (100%)	0	1
	Nasopharyngeal carcinoma	2 (66.7%)	1 (33.3%)	3
	Total	3 (75%)	1 (25%)	4

[Table/Fig-6]: Neoplastic lesions and their gender based distribution.



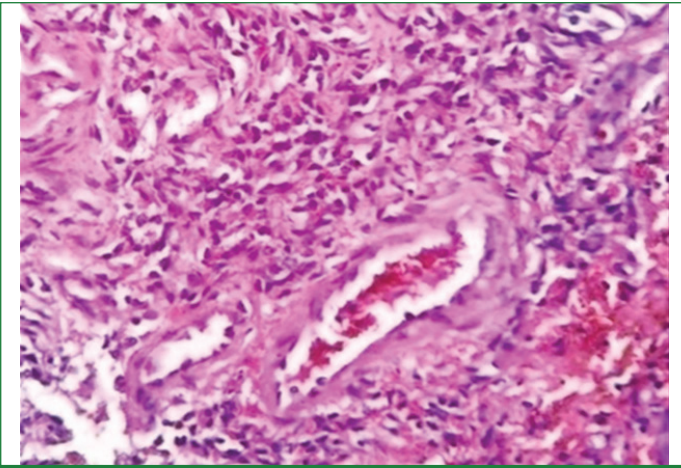
[Table/Fig-7]: Photomicrograph of inverted sinonasal papilloma (H&E Stain; 40x).

Angiofibromas were noted in 02 patients and histopathological study showed blood filled spaces separated by fibrous tissue [Table/Fig-8].

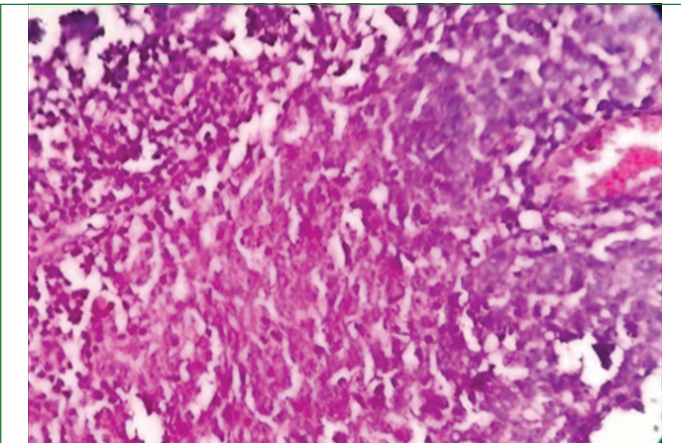
Among malignant neoplasms, 03 were undifferentiated nasopharyngeal carcinomas [Table/Fig-9] and 01 was Sinonasal carcinoma.

DISCUSSION

Sinonasal and nasopharyngeal masses together form a complex group with broad spectrum of histopathological features. In the present study, a total number of 100 cases were included. Age of the cases in this study varied from 11 to 80 years. Maximum number of cases were noted in age group of 31-40 years with 30 cases (30%), followed by 21-30 years with 23 cases (23%). Similar observation was noted in study done by Rokade V and



[Table/Fig-8]: Photomicrograph of Angiofibroma (H&E Stain; 40x).



[Table/Fig-9]: Photomicrograph of nasopharyngeal undifferentiated carcinoma (H&E Stain; 40x).

Kulkarni KJ [4,5]. Peak incidence of sinonasal polyps was noted in age group of 31-40 years, with male preponderance. This observation was in compliance with the studies by Kulkarni A et al., and Khan N et al., [5,8].

The male preponderance was noted in this study with a male to female ratio of 1.56:1, which was similar to other studies with a male to female ratio ranging from 1.39 to 1.6:1 [4-6,9,10].

In the present study, non neoplastic lesions were the predominant group with sinonasal polyps (including both inflammatory and allergic polyps) followed by fungal rhinosinusitis as the most common non neoplastic masses [Table/Fig-3].

Other researchers also noted sinonasal polyps as the most common non neoplastic lesions. [5,9,11-13] Majority of the sinonasal polyps were reported as inflammatory polyps [Table/Fig-3] with 41 cases [5,9,11-13], followed by allergic polyps with 23 cases. The chronic inflammation of nasal and sinonasal membranes may lead to polyps [3,14].

In sinonasal polyp patients usually present with chronic rhinosinusitis. The histopathological examination of the nasal polyps is useful to differentiate between eosinophilic or neutrophilic subtypes. Neutrophilic inflammation has been commonly noted in polyps from patients in Asian countries and in cystic fibrosis [15-17]. Pronounced eosinophilic infiltration has been observed in most sinonasal polyp cases in Western countries. Quantifying the eosinophilic burden in these patients has a significant effect on disease recurrence and on treatment of the cases [15-17].

Among the 10 cases reported as fungal rhino sinusitis, 08 cases were reported in postCOVID-19 patients who received steroids as a part of their treatment. The remaining 02 cases were diagnosed in diabetes mellitus patients. In this study, seven were diagnosed of fungal mucormycosis [Table/Fig-5], two cases were aspergillosis and one was mixed infection with both mucormycosis and aspergillosis [18].

COVID-19 being a life-threatening infectious disease, over expression of inflammatory cytokines, and impaired cell-mediated immune response with decreased CD4 T and CD8 T cell counts causing its susceptibility to fungal co infection [19]. The association between corona virus and mucormycosis of the paranasal sinuses as a new manifestation of COVID-19 is increasing over time and must be given serious consideration. Two main factors aggravating the illness were uncontrolled diabetes and over-zealous use of steroids must be properly checked [20].

Other non neoplastic lesions reported were 07 cases of chronic non specific inflammation, 03 granulomatous lesions and 02 were adenoid hypertrophies [5,7].

In the present study, among neoplastic benign cases, sinonasal papillomas (n=08) were noted forming 80% of all benign neoplastic masses [Table/Fig-6]. Male sex predilection was noted. Similar observations were depicted in other studies [5,21,22]. Histopathological picture showed invaginations of squamous epithelium into the underlying stroma [Table/Fig-7].

Angiofibromas were diagnosed in 02 cases and both were adolescent males. Similar observations were depicted in other studies [6,7,18, 23, 24] conducted over a period of two years. These two cases presented with recurrent profuse epistaxis. Angiofibromas showed peak age incidence in second decade.

In the present study, among 04 malignant neoplasms, 03 were undifferentiated nasopharyngeal carcinomas [Table/Fig-9] and 01 was squamous cell carcinoma. All were reported in males with 61-70 years as the peak age. Nasopharyngeal carcinoma as the most common cancer originating in the nasopharynx, was also noted in study done by Parajuli S et al., [22].

Limitation(s)

Limitation of the present study is being a record based study. Longer prospective studies are required over a bigger population to have exact data on the sinonasal and nasopharyngeal lesions.

CONCLUSION(S)

Non neoplastic lesions were seen in all age groups, while benign neoplastic lesions have a peak incidence in 31-40 years age group. Malignant tumours were predominant in the age group of 61-70 years. Inflammatory polyps were the most commonly diagnosed cases and few fungal rhinosinusitis in postCOVID-19 patients were noted in the present study. Inverted papillomas were predominant benign neoplastic lesions whereas nasopharyngeal carcinomas were noted as predominant malignant lesions with male predilection. Histopathological analysis is essential for arriving a definitive diagnosis leading to early and appropriate treatment, especially in the cases of malignant lesions.

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