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Spectrum of mass lesions in nasal cavity, Paranasal Sinuses and Nasopharynx: A Histopathological study of 115 cases

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Abstract
This was a retrospective study of 115 cases of space occupying lesions of nasal cavity, Paranasal sinuses and Nasopharynx for a period of 2 years. The aim of this study is to analyse the spectrum of Histopathological diagnosis of mass lesions in these sites. A variety of non-neoplastic and neoplastic lesions are commonly encountered in these sites in clinical practice. Clinically, most of these lesions are polypoidal and resemble each other; diagnostic imaging also could not provide definitive diagnosis in many of these cases. Hence Histopathological examination was mandatory for definitive diagnosis, so that timely intervention could be done. In our study, most of the Sino nasal mass lesions are non-neoplastic (inflammatory polyp being the commonest among them) and the non-neoplastic lesion of adenotonsillar hypertrophy was the most common nasopharyngeal lesion.

Keywords: Nasal cavity, Paranasal sinuses, Nasopharynx, Inflammatory polyp, nasopharyngeal carcinoma

Introduction
Lesions of the nasal cavity, Paranasal sinuses and Nasopharynx are commonly encountered in the clinical practice [1]. Incidence of these lesions was found to be 1-4% of population [2]. These masses have a broad spectrum of Histopathological features. They may be congenital, traumatic, inflammatory or neoplastic (benign or malignant) in origin. Majority of these lesions are polypoidal and commonly present with symptoms of nasal airway obstruction [3]. Neoplasms in these sites account for 0.2-0.8% of all malignancies [4]. Prevalence rate of nasal polyp was about 2% [5]. Detailed history of the patient, clinical and imaging examinations provides a provisional diagnosis but for definitive diagnosis, Histopathological examination is mandatory, so that timely intervention can be done. The aim of this study is to analyse the spectrum of Histopathological diagnosis of mass lesions in these sites and to compare these analysis with previous studies.

Materials and methods
This was a retrospective study of 115 cases of space occupying lesions of nasal cavity, Paranasal sinuses and Nasopharynx for a period of 2 years from 2018-2020 received in surgical pathology laboratory from the department of ENT in a tertiary care hospital. All tissues were fixed in 10% neutral buffered formalin and processed and then stained with Haematoxylin & Eosin. The Histopathological features were studied and immunohistochemistry was performed, wherever needed to arrive at a correct diagnosis.

Results
The mass lesions of nasal cavity, Paranasal sinuses and Nasopharynx were classified as non-neoplastic, benign and malignant masses. In this study, patients age were in range of 7-75 yrs. Majority of cases were in age group of 31-40yrs, with mean age being 35.8 years. (Fig 1). There was a male preponderance with 75 patients being male and 40 patients being female (Fig 2). Among 115 cases studied, there were 95 cases of nasal and Paranasal sinus masses and 20 cases of nasopharyngeal masses. On Histopathological examination, there were 89 non neoplastic lesions, 14 benign neoplastic lesions and 12 malignant lesions (Fig 3).

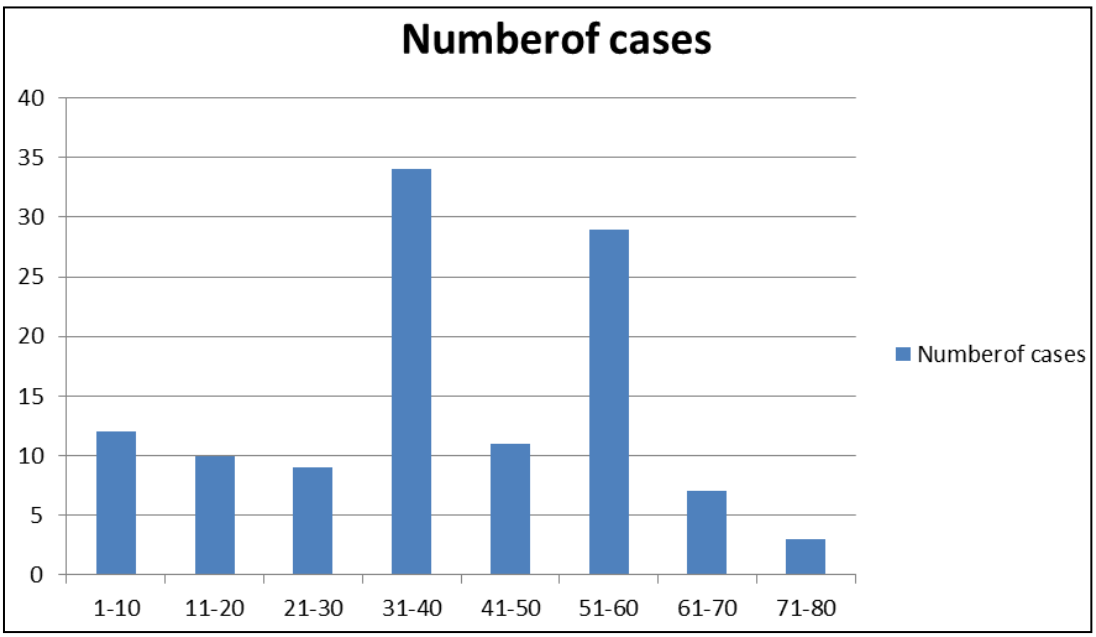

Fig 1: Distribution of patients according to age

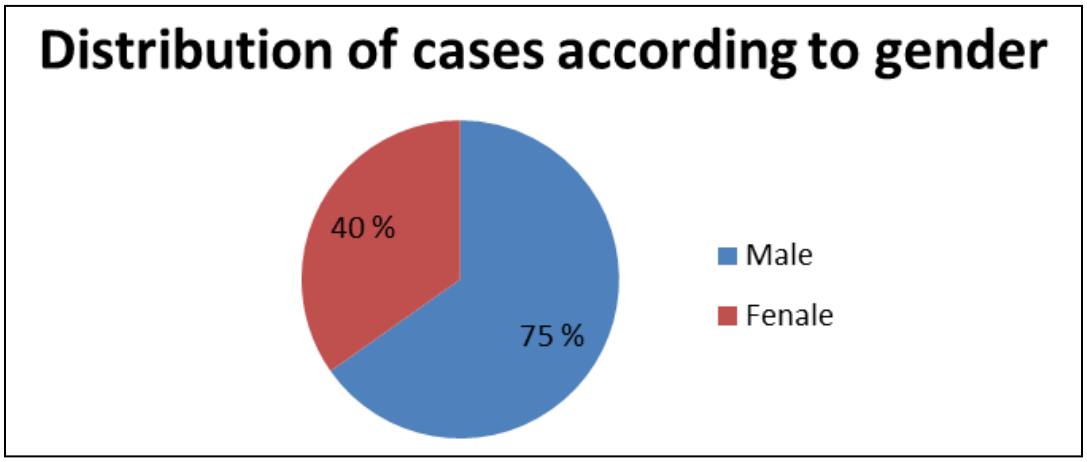

Fig 2: Distribution of cases according to gender

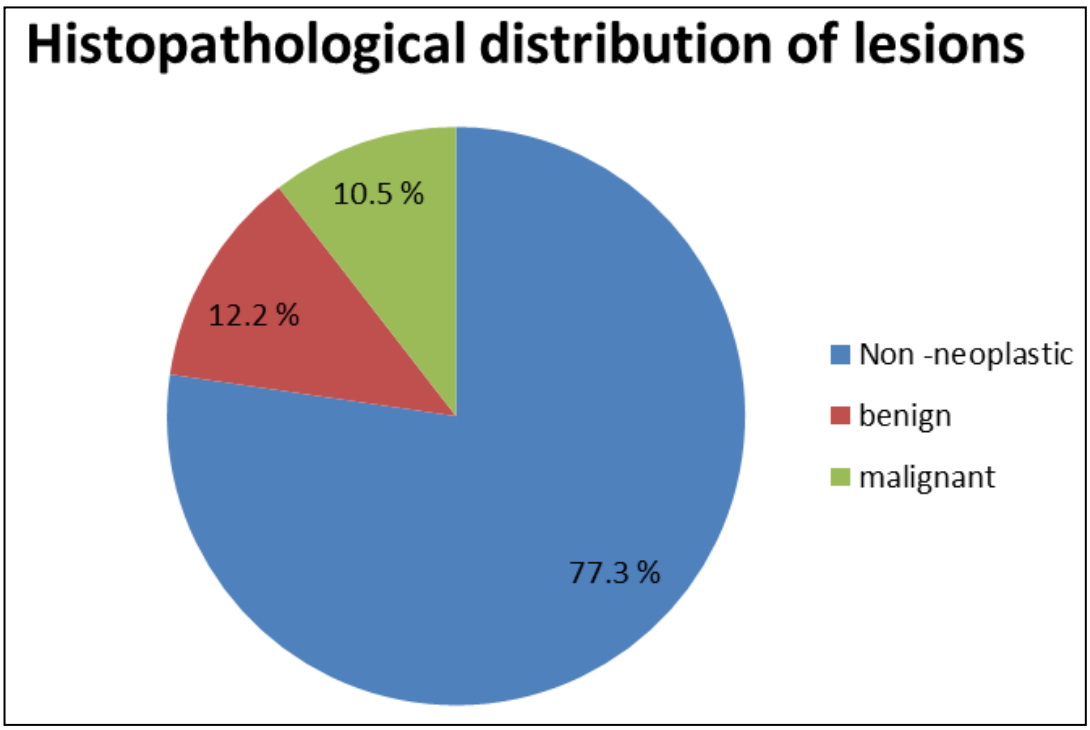

Fig 3: Histopathological distribution of lesions

Out of 95 Nasal and Paranasal sinus masses studied 73 (76.9%) were non-neoplastic lesions 14(14.7%) were benign lesions and 8(8.4%) were malignant lesions (Table 1). Among 73 of these non-neoplastic lesions studied, inflammatory nasal polyp was the commonest with 42 cases (57.5%) followed by allergic polyp in 18 cases (24.7%), fungal infection in 9 cases (12.3 %) rhinosporidiosis in 3 cases (4.1%) and hamartoma in one case (Fig 4). Among the fungal infection there were 7(9.6%) aspergillus cases and 2(2.7%) mucormycosis cases.

Table1: Histopathological distribution of lesions in Nasal cavity and PNS

Lesions	Nasal cavity and PNS	Percentage of cases %
Non-neoplastic	73	76.9
benign	14	14.7
malignant	8	8.4
Total	95	100

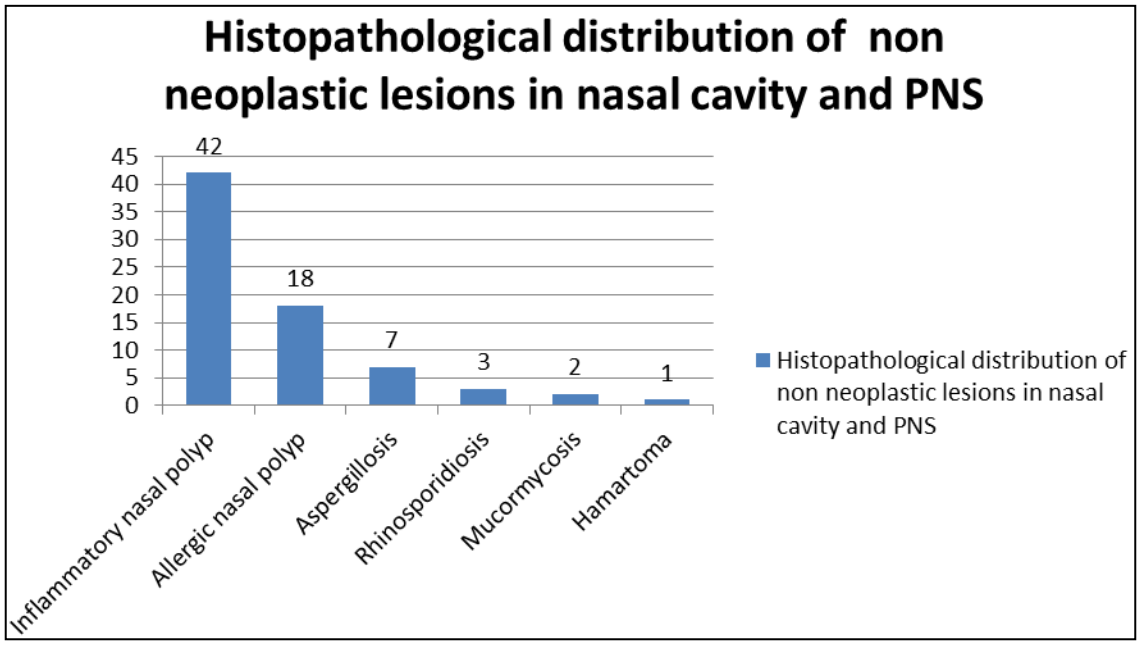

Fig 4: Histopathological distribution of non-neoplastic lesions in nasal cavity and PNS

Out of 22 neoplastic lesions, there were 14(64%) cases of benign tumours and 8 cases (36%) of malignant tumours. Among the benign tumours, inverted papilloma is the commonest, with 6 cases (42.86%), followed by angiofibroma in 4 cases (28.57%) and capillary haemangioma in 4 cases (28.57%), (Fig 5).

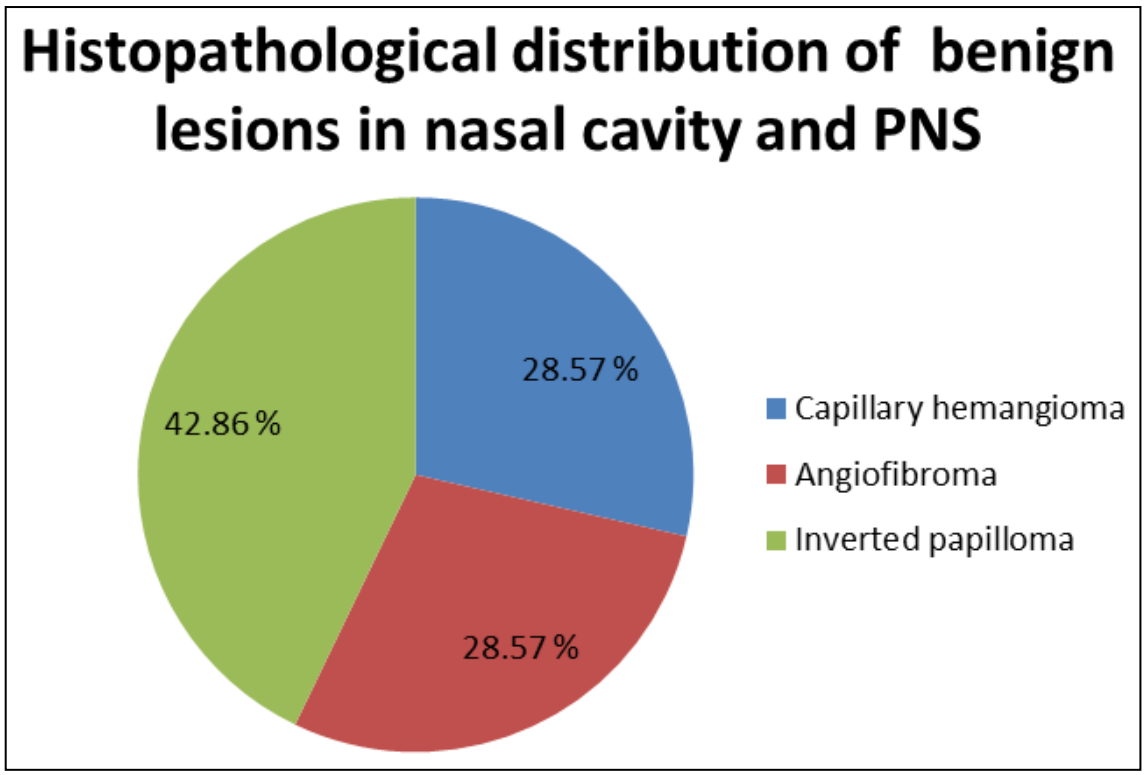

Fig 5: Histopathological distribution of benign lesions in nasal cavity and PNS

Out of 8 malignant cases, squamous cell carcinoma constituted 4 cases (50%) followed by non-Hodgkin`s lymphoma 2 cases (25%) and then adenoid cystic carcinoma and olfactory neuroblastoma each one case, (Table 2).

Table 2: Histopathological distribution of malignant lesions in nasal cavity and PNS

Malignant lesions	Number of cases	Percentage of cases %
Squamous cell carcinoma	4	50.0
Non Hodgkins lymphoma	2	25.0
Adenoid cystic carcinoma	1	12.5
Olfactory neuroblastoma	1	12.5
Total	8	100

Out of total 20 nasopharyngeal masses studied, there were 16(80%) non-neoplastic and 4(20%) neoplastic lesions. All non-neoplastic lesions were of adenotonsillar hypertrophy (100%) and all 4 neoplastic lesions were of nasopharyngeal carcinoma, (Table 3).

Table 3: Histopathological distribution of lesions in Nasopharynx

Lesions		Number	Percentage
Non neoplastic lesions	Adenotonsillar hypertrophy	16	80
Malignant	Nasopharyngeal carcinoma	4	20

Discussion

Space occupying masses in the nasal cavity, Paranasal sinuses and Nasopharynx are a group of lesions with wide spectrum of Histopathological features. Clinically it is quite impossible to differentiate non-neoplastic, benign neoplastic and malignant lesions in most of the patients, and most of these lesions were clinically diagnosed as nasal polyps; imaging also cannot give clear cut differentiation between the non-neoplastic, benign neoplastic and malignant lesions in significant number of the patients [6].

Frequently these lesions were neglected by the clinicians as infective and allergic aetiology. Lack of differentiation as benign and malignant disorders at the time of presentation leads to delay in the initiation of treatment.

In this study, these upper respiratory tract masses had predilection for males with a male to female ratio of 1.8:1 and this was similar to the study done by Zafar *et al.* [1], with male to female ratio of 1.7:1; in the study done by Gupta *et al.* [7], the male to female ratio was 1.35:1 while in the study done by Rawat *et al.* [8], M:F ratio was 2.1:1.

Out of these 115 cases, 27 cases (23%) were Neoplastic lesions and 88 cases (77.3%) were non neoplastic lesions; similarly 25% were neoplastic lesions and 75% were non-neoplastic lesions in the study done by Trilok C Guleria *et al.* [9], and 81.6% were of non-neoplastic lesions in the study done by Dinesh Garg *et al.* [10], and 89% of cases were of non-neoplastic lesions in the study done by Zafar *et al.* [1].

Among the masses of nasal cavity and Paranasal sinuses in our study, nasal polyp constituting 82.1% was higher than the study done by Tondon *et al.* (64%) [11] and Dasgupta *et al.* (62.5%) [6]. In our study the most commonly encountered polyp was inflammatory polyp, (Fig 6). This was similar to the study done by Jenice Jaison *et al.* [12]. In the study carried out by Tandon *et al.* [11], Allergic polyps (Fig 7) were the most common polyps as compared to inflammatory polyps.

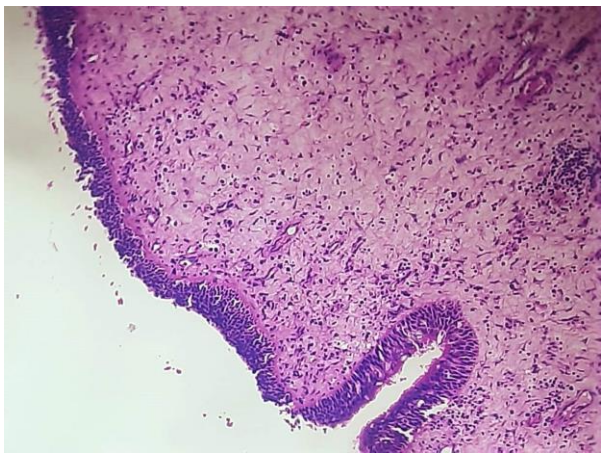

Fig 6: Microscopy of inflammatory nasal polyp showing a lining of respiratory epithelium, beneath which is seen a predominantly lymphocytic inflammatory infiltrate with few plasma cells and neutrophils, H & E 100X

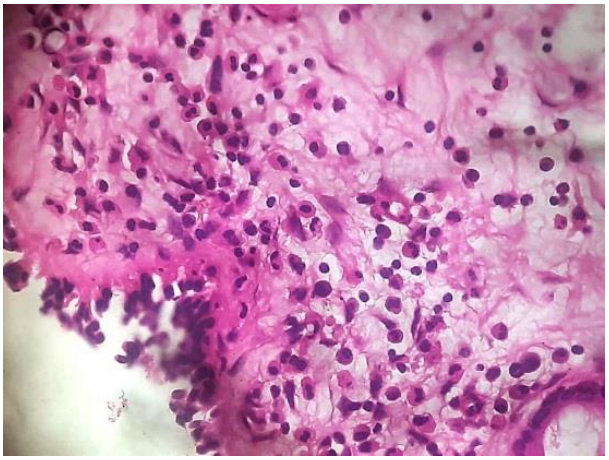

Fig 7: Microscopy of allergic nasal polyp showing a lining respiratory epithelium beneath which is seen a predominantly eosinophilia infiltrate with few plasma cells and lymphocytes, H & E 400X

In our study, nine cases (12.3%) of fungal infection were seen and of this, 7 cases were aspergillus (Fig 8) and 2 cases were mucormycosis (Fig 9). The incidence was slightly higher when compare to the study done by Ambrish Kumar *et al.* (9.6%) [13] and Dinesh Garg *et al.* (5.49%) [10].

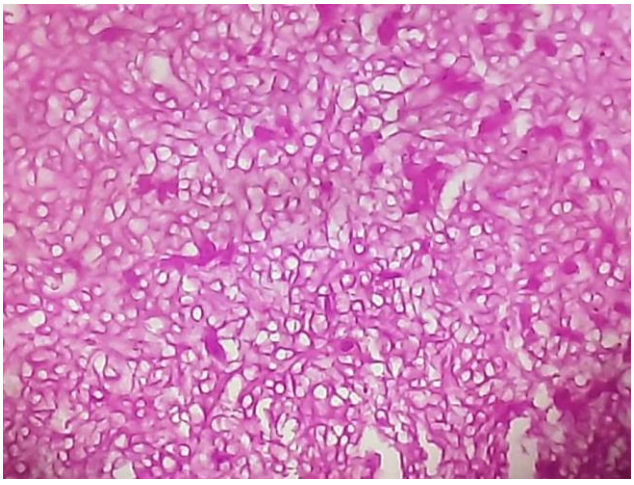

Fig 8: Aspergillus fungal infection showing branching hyphae with frequent stations, H & E 400X

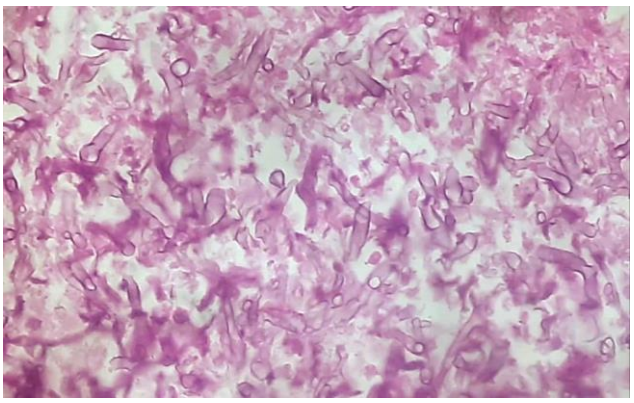

Fig 9: Mucor fungal infection showing broad none spectate hyphae, H & E 400X

In this study rhinosporidiosis incidence was 4.1% but the studies done by Dasgupta *et al.* (31.5%) [6] and Kulkarni *et al.* (14%) [15] Showed higher incidence for rhinosporidiosis. In our study, one case of hamartoma was reported which was in 2nd decade.

In the current study, the most common benign neoplastic lesion of nasal cavity and Paranasal sinuses is inverted Nasal papilloma (Fig 10). We observed 6 cases of inverted papilloma, forming 42.86% of all benign neoplastic lesions which is similar to the study done by Dinesh Garg *et al.* (46%) [10], and slightly higher than in the study done by Humayun *et al.*, (33.33%) [15]. In the current study, 4 cases of angiofibroma (Fig 11) was reported in adolescent males which comprised 28.57% of benign neoplastic cases, while Ambrish *et al.* [13] observed 16.7% and Parajuli S *et al.* [16] observed 15.8 % of angiofibroma among benign neoplastic lesions in their studies. In the current study, capillary haemangioma constituted 28.57% of cases which was slightly higher than Ambrish *et al.* (16.7%) [13] and Modh *et al.* (19.4%) [17].

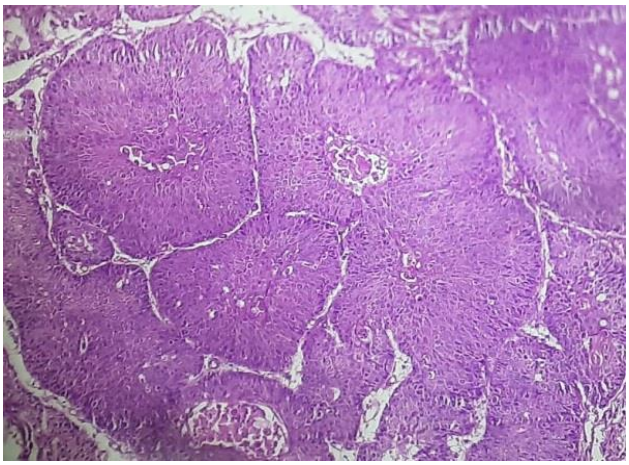

Fig 10: Microscopy of inverted papilloma showing entophytic growth of squamous nest with smooth outer contour, H & E 400X

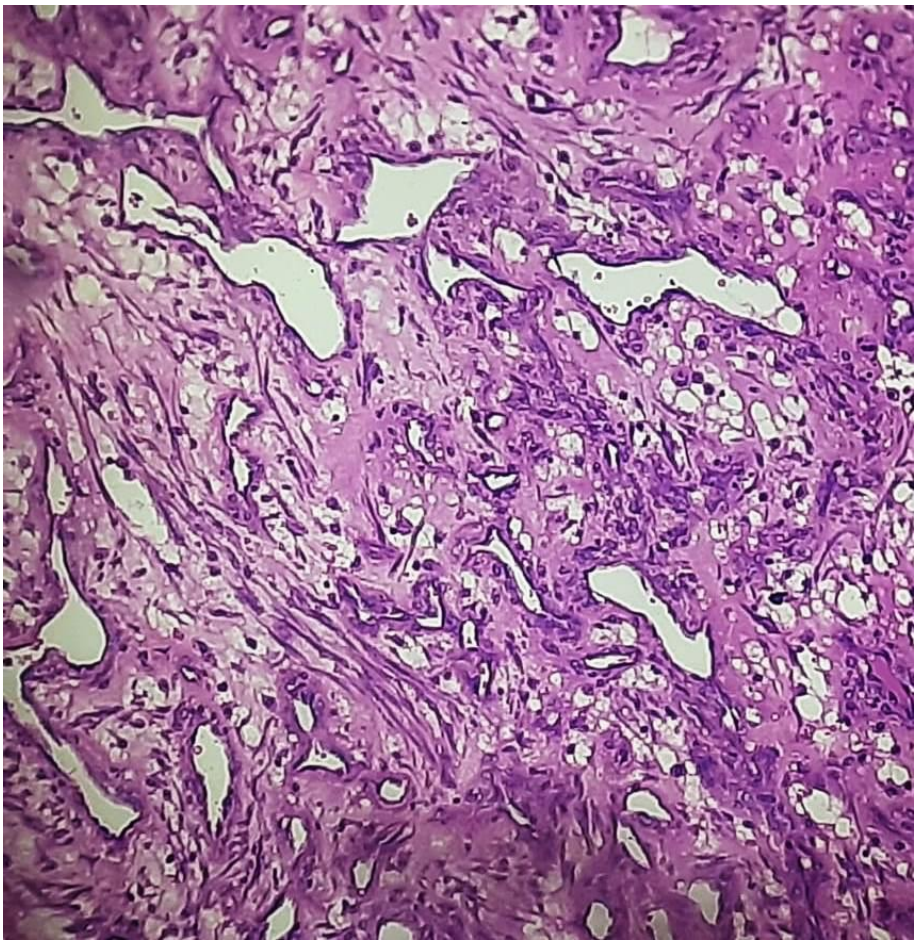

Fig 11: Microscopy of angiofibroma showing dilated vessels of varying sizes with fibrous stroma, H & E 100X

Sino nasal tract malignancies are rare. They also present as polyps in elderly age which can cause a delay in diagnosis. In this study Squamous cell carcinoma is the commonest histological type and constituted 50% of malignant lesions, which was comparable to the study done by Ambrish *et al.* (60%) [13] and Dinesh Garg *et al.* (46.15%) [10].

In the current study, 2 cases of non-Hodgkin's lymphoma was reported accounting for 25% of malignant tumours but only 7.69% was observed by Dinesh Garg *et al.* [10]. One case of adenoid cystic carcinoma (Fig 12) was reported. A single case (12.5%) of olfactory neuroblastoma (Fig 13), a rare neuron ectodermal tumour arising from the olfactory epithelium in the upper nasal cavity, was reported which was in concordance with Parajuli S *et al.* (11.5%) [16], Trilok C Guleria *et al.* [9] reported 2 cases (10%) of olfactory neuroblastoma.

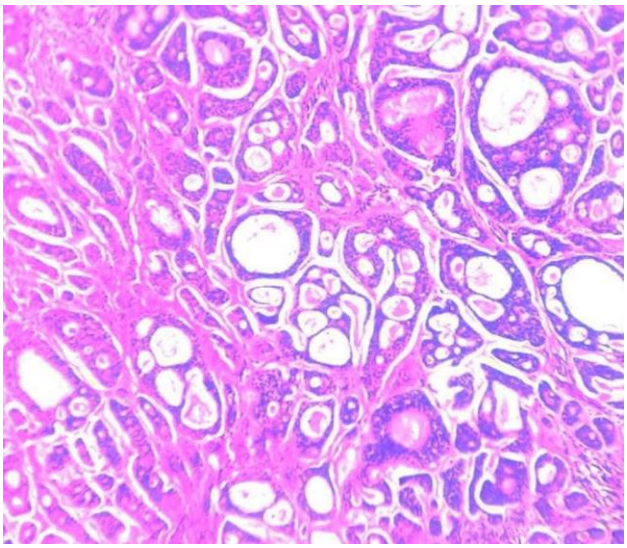

Fig 12: Microscopy of Adenoid cystic carcinoma showing cribriform pattern, H & E 100X

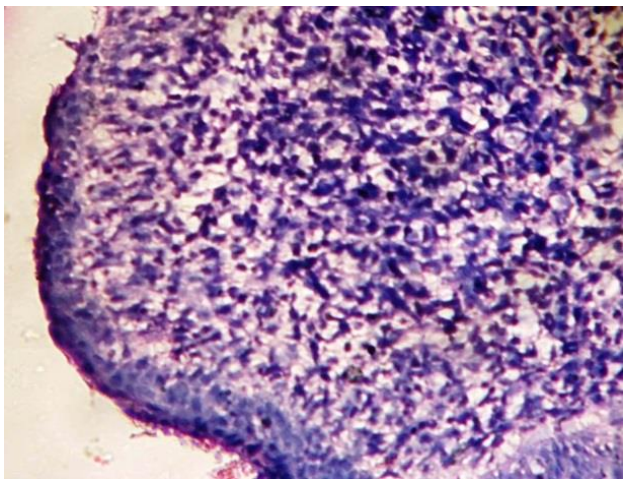

Fig 13: Microscopy of Olfactory neuroblastoma showing solid sheets of monotonous tumour cells with round nuclei and scant cytoplasm, H & E 400X

Nasopharyngeal masses either arise from nasopharyngeal mucosa or from neuroectoderm. These patients will be presenting with nasal obstruction, epistaxis, mouth breathing and ear ache. In this study, majority of nasopharyngeal masses were of adenotonsillar hypertrophy and was similar to the study done by Dinesh Garg *et al.* (86%) [10] But in contradiction to Biswas *et al.* [18], reporting antrochoanal polyp as the commonest nasopharyngeal mass. In the present study, majority of cases were in age group of less than 10 years of age.

In this study, 4 cases of well differentiated nasopharyngeal carcinoma was reported of this 2 cases were keratinising squamous cell carcinoma type and 2 cases were undifferentiated type of nasopharyngeal carcinoma. Undifferentiated type carcinoma presented in 2nd decade of life and they presented with cervical lymph node metastasis. In the study done by Janice Jaison *et al.* [12], 2 cases of keratinising squamous cell carcinoma type of nasopharyngeal carcinoma was reported.

For non-neoplastic lesions and benign lesion, local surgical excision was the main treatment modality. For malignant lesions, wide local excision, chemotherapy, radiotherapy or combination therapy are the treatment followed on individual case basis.

Conclusion

Mass lesions of the nasal cavity, Paranasal sinuses and Nasopharynx are common in clinical practice, with variety of non-neoplastic and neoplastic lesions occurring in these sites. Because of the overlapping clinical and imaging features, Histopathological examination is mandatory for the correct diagnosis and for initiating appropriate treatment. Most of the Sino nasal mass lesions are non-neoplastic (inflammatory polyp being the commonest among them), with inverted papilloma being the commonest benign neoplastic mass and squamous cell carcinoma being the commonest malignant mass. The non-neoplastic lesion of adenotonsillar hypertrophy constitute the commonest nasopharyngeal mass, with nasopharyngeal carcinoma being the commonest neoplastic nasopharyngeal mass lesion.

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