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Histopathological spectrum of polypoid lesions of nasal cavity in a tertiary care center in Pondicherry

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Abstract
Lesions occurring in the nasal cavity usually present as polypoid masses. Majority of these lesions are non-neoplastic and tumors occurring in the nasal cavity often masquerade as a chronic inflammatory condition. Even though the malignant lesions have a low incidence, they have a relatively greater amount of morbidity. Aim of this study is to 1. Analyse the histopathological spectrum of polypoid lesions of nasal cavity, 2. Frequency of neoplastic and non-neoplastic lesions, 3. to find the age and sex predilection in these lesions. The study comprises of 230 non-neoplastic and neoplastic cases of nasal cavity, over a period of four and a half years in Mahatma Gandhi Medical College and Research Institute, Pondicherry. Because of their nonspecific clinical features, histopathological examination remains as the mainstay for a definitive diagnosis.

Keywords: nasal polyps, hemangioma, angiofibroma, glomangiopericytoma, squamous cell carcinoma

1. Introduction
Nasal cavity though relatively small, is the site for a variety of lesions. Large number of lesions occurring in the nose and paranasal sinuses present as polypoid lesions in the nasal cavity. Nasal polyps are defined as simple oedematous hypertrophy of the mucosa and is the commonest cause of nasal obstruction in adults with a prevalence of 4% in the general population. The etiology of nasal polyps is multifactorial and majority of them are due to chronic mucosal inflammation and allergy [1, 2]. Inflammatory polyps are the commonest polypoid lesions of the nose and are referred as true nasal polyps, commonly encountered in adults with a predilection for males [3].
Tumors occurring in the nasal cavity have a tendency to become polypoid and their symptoms often mimic that of a chronic inflammatory condition. Although malignant tumors of the sinonasal region represent only 3% of the head and neck neoplasms, their nonspecific clinical features make the diagnosis difficult [4]. Hence histopathological examination provides a definitive diagnosis for early detection and treatment.
Since there is paucity of available data on nasal lesions in the southern states of India, the present study is intended to study the occurrence of various histopathological types of polypoid nasal lesions in patients from Pondicherry.

2. Materials and Methods
The study was conducted in the Department of Pathology at Mahatma Gandhi Medical College and Research Institute, over a period of four and half years from January 2009 to December 2011 and January 2014 to May 2015 both retrospectively and prospectively. Two hundred and thirty specimens were studied during this period. The formalin fixed specimens were subjected to routine gross examination after which adequate sections were taken from the representative sites and stained with haematoxylin and eosin. Special stains were done wherever they were applicable. Based on the microscopic findings, the cases were classified into neoplastic and non-neoplastic lesions and the neoplastic lesions were further classified according to the recent WHO classification.

3. Results
The histopathological analysis of the 230 cases which were clinically diagnosed as nasal polyps revealed that 197 (85.7%) cases were non-neoplastic lesions and 33 (14.3%) cases were neoplastic lesions. Among the 33 neoplastic lesions, 24 were benign, 1 borderline and 8 cases were malignant lesions. [Table 1]

3.1 Non-Neoplastic Lesions
True nasal polyps (175 cases) were the commonest non-neoplastic lesions which were encountered in this study. They are further subdivided into allergic and inflammatory polyps. 111 cases of inflammatory polyps were diagnosed histologically based on loose oedematous stroma with lymphocytic and plasma cells infiltrate. 64 cases of allergic polyp were seen which showed eosinophils infiltrating the stroma. 22 cases of fungal infections were diagnosed which comprised of 13 cases of mucormycosis, 6 cases of rhinosporidiosis and 3 cases of aspergillosis.
Inflammatory and allergic polyps showed a peak incidence in the 4th decade with a M: F ratio of almost 1:1. Mucormycosis affected individuals of all age group especially the older patients and showed a slightly male predominance. [Table 2 &4]

3.2 Neoplastic Lesions
Thirty-three cases of neoplastic lesions were encountered, out of which 24 cases were benign, one was a borderline Glomangiopericytoma lesion and 8 cases were malignant. Of the benign lesions, schneiderian papilloma was the most common comprising of both the inverted and everted papilloma, followed by hemangioma. Among the malignant neoplastic lesions, squamous cell carcinoma accounted for most cases, while olfactory neuroblastoma and lymphoma

accounted for each one case.

Neoplastic tumors were mostly seen in the age group of 31-40 years. Angiofibroma and meningioma affected the younger age group especially young adolescent males in angiofibroma [Figure 1& 2]. Squamous cell carcinoma and lymphoma were seen in patients of more than 50 years of age [Figure 3&4]. Male preponderance was seen in all types of neoplastic lesions except meningioma and glomangiopericytoma. One case of primary sinonasal meningioma was encountered in an 11-year-old girl. [Table 3 &4]

4. Discussion

Polyps and polypoid masses in the nose and paranasal sinuses are very common lesions encountered in the clinical practice. It may be due to simple nasal polyps or polypoid lesions due to a variety of other pathologic causes ranging from infective disease to polypoid neoplasms. Although majority of nasal polyps sent for histopathological study are inflammatory secondary to infection or idiopathic causes, a variety of neoplasms also presents as nasal polyps ranging from benign lesions to malignant nasal tumors. Therefore, since it is clinically difficult to distinguish a simple nasal polyp from a neoplasm, histopathological study remains as the mainstay for a definitive diagnosis.

In a similar study which was carried out by Dafale *et al* in Karnataka, included 70 cases of polypoid lesions of the nasal cavity, of which 62 (88.5%) were non-neoplastic comprising of allergic and non-allergic polyps and 8(11.4%) were of neoplastic origin. Of the neoplastic polyps, 6 (75%) were benign and 2 (25%) were malignant polypoid lesions [5]. In the present study non-neoplastic polyps (85.7%) formed the largest group of polypoid lesions, followed by neoplastic polyps (14.3%). These findings were consistent with the observations made in other studies. Our study showed that majority of non-neoplastic cases were in age group 31-40 years affecting mostly the fourth followed by third decades, while other studies showed a peak incidence in the 2^{nd} – 3^{rd} decades [6, 7].

Among the benign lesions, study conducted by Lathi *et al* (2011) in Maharashtra found that most of the cases occurred at 41-50 years of age and malignancy after 60 years. In our present study, benign tumors were commonly seen in the age group 31-40 years. A case series by Saha *et al* showed that inverted papillomas mostly belonged to the fifth decade (46%) with a male:female ratio of 10:1 [8]. Our study observed inverted papilloma in patients above 70 years of age and M:F ratio of 9:1.

Schneiderian papillomas (36.4%) were the commonest benign nasal lesion and capillary hemangioma (27.3%) was the second most common benign nasal neoplasm in the present study, which was similar to study conducted by Dafale *et al*. [5] Whereas studies by Kulkarni *et al* and Lathi *et al* showed that hemangioma was the commonest benign lesion and inverted papilloma was the second commonest lesion.

Extracranial meningioma are benign tumors arising from arachnoid cells present within sheath of nerves or vessels that are entrapped during embryologic development in an extracranial location or arise from pluripotent mesenchymal cells [9]. A study by Rushing *et al*, an analysis of 146 cases showed that majority of cases occurring in the nasal cavity were meningiothelial meningioma (71.5%) [10]. Present study had one case of extracranial sinonasal meningioma in a 11-year-old girl.

In the present study, one case of glomangiopericytoma was encountered in a 36-year-old female who presented with a nasal mass in the right nasal cavity. It is a rare vascular tumor accounting for less than 0.5% of all sinonasal tumors with a peak incidence in the 6^{th}-7^{th} decade [11]. Histologically it comprises of tightly packed cells interspersed with many vascular channels showing prominent perivascular hyalinization. The neoplastic cells are elongated to oval, with round to spindle-shaped nuclei and lightly eosinophilic cytoplasm [12].

Among the malignant lesions reported in this study, squamous cell carcinoma was the commonest constituting about 75% of the malignant lesions, almost in comparison to other studies with a M:F ratio of 5:1.

Malignancy of connective tissue origin is rare but can present as primary neoplasm of nose and paranasal sinuses. Non Hodgkins lymphoma can occur in any age group but predominantly affect the older age group. A study conducted Shohat *et al* showed that M:F ratio is 1:1 for lymphoma [13]. In our study, we reported a single case of lymphoma in a 65 year old male.

Olfactory neuroblastoma is an uncommon neuroectodermal nasal malignancy arising from the olfactory cells and most commonly present as unilateral polypoid nasal mass. it has a bimodal presentation with peaks in the second and sixth decades of life [14]. It accounts for up to 5% of intranasal neoplasms. In our study, one case of olfactory neuroblastoma in a 48-year-old male was encountered.

5. Tables and Figures

Table 1: Relative frequency of occurrence of polypoid nasal lesions

Lesion	Total	Percentage
Non-neoplastic nasal lesions	197	85.7
Benign nasal lesions	24	10.4
Borderline nasal lesions	1	0.4
Malignant nasal lesions	8	3.5
Total	230	100

Table 2: Histological types, gender distribution and peak incidence of non-neoplastic lesions

Type of lesions	Male	Female	Peak incidence	Total no: of cases
Non-neoplastic lesions				
Allergic polyp	36	28	31-40	64
Inflammatory polyp	57	54	31-40	111
Aspergillosis	1	2	31-40	3
Mucormycosis	9	4	61-70	13
Rhinosporidiosis	4	2	31-40	6
Total	107	90		197

Table 3: Histological types, gender distribution and peak incidence of neoplastic lesions

Type of lesion	Males	Females	M:F ratio	Peak incidence	Total no: of cases
Benign Lesions					
Capillary Hemangioma	5	4	1.25:1	31-50	9
Inverted papilloma	9	1	9:1	71-80	10
Everted papilloma	1	1	1:1	21-30	2
Angiofibroma	2	0	2:0	11-30	2
Meningioma	0	1	0:1	11-20	1
Borderline Lesions					
Glomangiopericytoma	0	1	0:1	31-40	1
Malignant Lesions					
Squamous cell Carcinoma	5	1	5:1	61-80	6
Olfactory neuroblastoma	1	0	1:0	41-50	1
Lymphoma	1	0	1:0	61-70	1
Total	24	9			

Table 4: histopathological types and their incidence in different gender and age groups

	0-10		11-20		21-30		31-40		41-50		51-60		61-70		71-80		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Allergic polyp	0	0	4	1	10	9	13	13	2	5	6	0	1	0	0	0	64
Inflammatory polyp	2	1	13	8	12	12	12	14	10	9	5	8	2	2	1	0	111
Aspergillosis	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3
Mucormycosis	0	1	0	0	1	1	1	0	1	1	1	0	4	1	1	0	13
Rhinosporidiosis	0	0	0	0	1	0	1	2	0	0	0	0	2	0	0	0	6
Capillary Hemangioma	1	0	0	0	1	1	2	1	1	2	0	0	0	0	0	0	9
Inverted papilloma	0	0	0	0	0	0	3	0	1	0	1	1	0	0	4	0	10
Everted papilloma	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Angiofibroma	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
Meningioma	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Glomangiopericytoma	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Squamous cell Ca	0	0	0	0	0	0	0	0	1	0	0	0	2	1	2	0	6
Olfactory neuroblastoma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

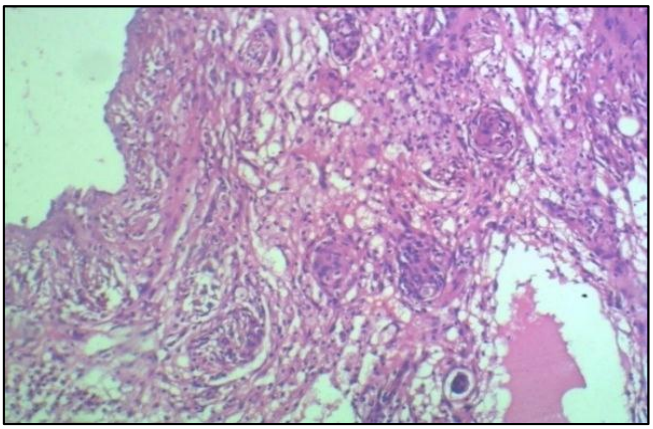

Fig 1: Angiofibroma (H&E 10x)

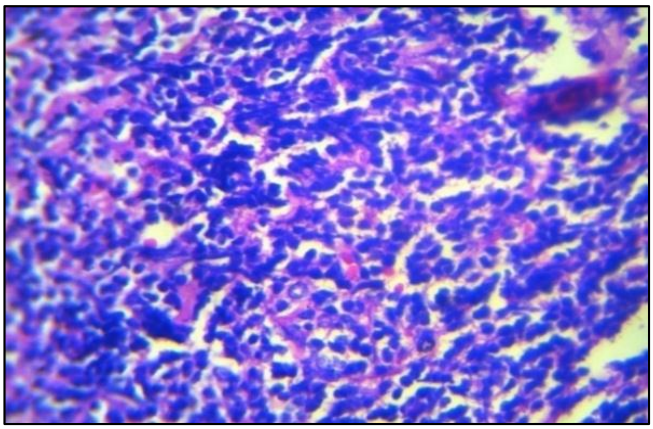

Fig 3: Squamous cell carcinoma (H&E 10x)

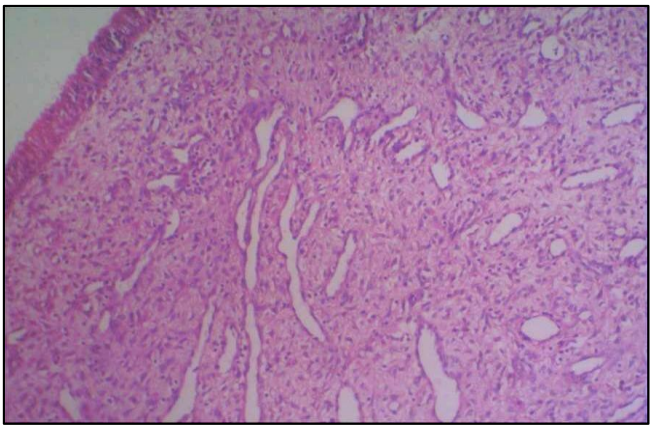

Fig 2: Meningioma (H&E 10x)

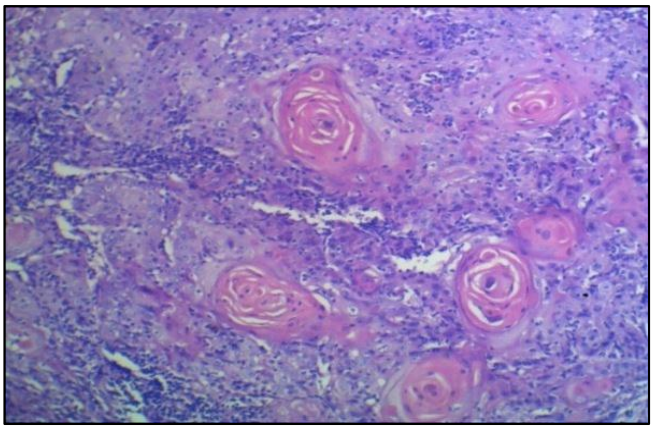

Fig 4: Lymphoma (H&E 40x)

6. Conclusion

The present study provides current hospital based epidemiological data on age of presentation, gender distribution and histological variants of polypoid nasal lesions that were studied over a significant period of four and half years in a tertiary care hospital setup of Pondicherry. Due to the overlapping clinical presentation of lesions in the sinonasal region, the role of histopathological examination is mandatory for proper diagnosis and early treatment of the patient.

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