

ORIGINAL ARTICLE**HISTOPATHOLOGICAL SPECTRUM OF POLYPOIDAL LESIONS OF NASAL & PARA-NASAL SINUSES**

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ABSTRACT:

INTRODUCTION: Polypoidal lesions of nasal and para-nasal sinuses are commonly seen in clinical practice and have a wide array of histopathological subtypes. Aim of this study was to observe the occurrence and distribution of these subtypes. **METHODOLOGY:** An observational study over 3 years (2014 – 2017) was carried out at a tertiary care centre. The details of all the histo-pathological specimens of polypoidal lesions from nasal & para-nasal sinuses were processed and subtyped as per defined protocol. The observations were analysed, classified and compared with other studies using appropriate statistical tests. **RESULTS:** Out of total 96 specimens, majority of the lesions (n=47, 48.96%) belonged to young age group (21 to 40 years). Non-neoplastic lesions comprised of 82 cases (85.41%) with inflammatory polyp being the most common subtype (n=66, 68.80%). Neoplastic lesions showed Inverted Papilloma (n=4.16%), Angiofibroma (n=3.12%) and Hemangioma (n=3.12%) as commonest lesions. Malignant subtypes were seen in 2 cases. **CONCLUSION:** Non-neoplastic lesions were the most common variety of nasal / para-nasal polypoidal masses, with inflammatory polyp being the most common subtype. Histological analysis helps in prognosis and management of such polypoidal lesions.

KEYWORDS:**Polypoidal lesions, Nasal and Para-nasal Sinuses, Histopathology****INTRODUCTION:**

The nasal cavity, para-nasal sinuses and nasopharynx form a functional unity that is reflected in the communality of the pathologic processes that involve the region. This is particularly the case for the first two components, which are often grouped under the term sinonasal. The two main types of epithelia lining these structures are stratified squamous and respiratory type pseudo-stratified columnar¹. A wide array of neoplastic and non-neoplastic conditions present as a mass lesion². Nasal polyps are polypoidal masses arising from mucus membranes of nose and para-nasal sinuses and are one of the most commonly encountered lesions in clinical practice³. The formation of nasal polyps is associated with recurrent attacks of rhinitis. They are focal protrusions of the mucosa which may reach 3-4 centimetres in length⁴. They are often bilateral and multiple, which lead to visible broadening of nose. These lesions affect males predominantly in 3:1 ratio¹. Histopathological analysis helps to distinguish the nature of these lesions and thereby its management and prognostication.

MATERIAL AND METHODS:

An observational study was carried out at the department of Pathology in a tertiary care centre of Western India, with an aim to study the classification of nasal and para-nasal sinus polypoidal lesions in terms of its histopathology and demographic distribution.

Details of all the histopathological specimens from nasal and para-nasal sinuses were collected from the duration of June 2014 to May 2017 (36 months). Formalin fixed tissues were processed and embedded with paraffin as per standard protocol. This section of 3-4 micrometres were stained with haematoxylin & eosin (H&E) stain. Special stains were used whenever necessary. Various parameters related to histopathological analysis of the specimens were noted. The data was statistically analysed using standard descriptive statistical measures.

OBSERVATIONS AND RESULTS:

During the study period of 36 months, a total of 96 biopsy specimens from nasal and para-nasal sinus were analysed.

Age:

Mean age of presentation was 33.05 years \pm 15.65 years and median was 31.5 years. The most common age group was between 21 to 40 years (n=47, 48.96%), thereby indicating common prevalence in young age group. Malignant lesions (n=2) were seen between the age group of 55 to 65 years.

Gender:

Male preponderance was observed in the ratio of 1.34 (55 males v/s 41 females). Non-neoplastic lesions (n=82) had 47 males and 35 females (Ratio 1.34), while neoplastic lesions (n=14) had 8 males and 6 females (Ratio 1.33).

Neoplastic v/s Non-neoplastic lesions:

Significant proportion of patients had non-neoplastic polypoidal lesions (n=82, 85.41%). Neoplastic lesions were observed in 14 (14.59%) patients (12 benign origin, 2 malignant origin). Male predominance was seen in both the groups. Malignant lesions were found in patients above 50 years age.

TABLE I: Classification & Demographics of Nasal Polypoidal Lesions

	NUMBER (%)	MALE	FEMALE	MEDIAN AGE (years)
NON NEOPLASTIC				
Allergic	4 (4.16%)	3	1	44
Non Allergic				
<i>Inflammatory (Non-specific)</i>	66 (68.80%)	38	28	30
<i>Fungal</i>	7 (7.29%)	3	4	42
<i>Granulomatous lesion</i>	3 (3.12%)	1	2	24
<i>Rhinoscleroma</i>	1 (1.04%)	1	0	19
<i>Lepromatous Leprosy</i>	1 (1.04%)	1	0	37
NEOPLASTIC BENIGN				
Inverted Papilloma	4 (4.16%)	3	1	34
Angiofibroma	3 (3.12%)	3	0	39

Hemangioma	3 (3.12%)	0	3	16
Neurofibroma	1 (1.04%)	1	0	38
Trichoepithelioma	1 (1.04%)	1	0	6
NEOPLASTIC MALIGNANT				
Undifferentiated Nasopharyngeal Carcinoma	1 (1.04%)	0	1	55
Sinonasal Non keratinized Squamous Cell Ca	1 (1.04%)	0	1	65
TOTAL	96 (100%)	55	41	31.5

Subtypes of Polypoidal Lesions:

Non-specific inflammatory polyps were overall the most common subtype of polyp, seen in 68.8% (n=66) of patients. Infective fungal polyps were present in 7.29% (n=7) cases while allergic polyps formed 4.16% (n=4) of the patient group. Amongst the neoplastic group, the most common pathology seen was Inverted Papilloma (n=4, 4.16%), followed by Angiofibroma and Hemangioma, with 3 cases (3.12%) each. Malignant lesions were seen in 2 cases, one with Nasopharyngeal Carcinoma (female, 55 years) and one with Non-keratinized Squamous Cell Carcinoma (female, 65 years). Details and classification of all the subtypes observed has been described in Table I.

DISCUSSION:

Polypoidal masses in the nasal cavity form a wide variety of lesions with different histopathological features. The nasal polypoidal lesions arise as mass like projections from the nasal and para-nasal sinus mucosa, leading to clinical symptoms such as nasal fullness, anosmia, nasal discharge, etc. Clinical differentiation between the subtypes of nasal masses is difficult. Hence, it is the histological analysis that helps to distinguish the subtypes, especially between the non-neoplastic and neoplastic variants.

In our study, out of the total 96 cases collected over 3 years, younger age and male gender predominance was observed. Comparative analysis with other similar studies is mentioned in Table II. The most common age group of presentation in current study was 21 to 40 years, comparable to other studies. Male dominance has uniformly been observed amongst all the previous hospital and population based studies, although with variable male to female ratio.

Looking into the primary categorization of nasal masses, non-neoplastic lesions are the most commonly observed category. Similar observations were made in this study as well as in the previous studies by Bijjaragi et al³, Zafar et al⁵ and others. However, the study by Dasgupta et al⁶ noted nearly equal number of non-neoplastic and neoplastic cases, which was quite contrary to the observations from other studies.

Table II: Comparison of present study with similar studies

	Dasgupta et al⁶	Maru et al⁷	Kalpana et al⁸	Zafar et al⁵	Bijjaragi et al³	Kulkarni et al⁹	Present Study
No. of cases	345	70	100	240	132	117	96
M:F Ratio	2.1	3.1	2.4	1.7	1.6	2.16	1.34
Inflammatory Polyps (%)	62.8%	48%	35%	49.58%	55.3%	69.3%	68.8%
Non-neoplastic lesions (%)	50.7%	71.43%	66%	60%	76%	86%	85.41%
Neoplastic lesions (%)	49.3%	28.57%	34%	40%	24%	14%	14.59%

Nonspecific inflammatory and allergic polyps are the most common subtypes amongst the non-neoplastic group. Histologically, inflammatory polyps are characterized by oedematous mucosa with loose stroma, often harbouring hyperplastic or cystic mucous glands, infiltrated with cells such as neutrophils, eosinophils, plasma cells & occasional lymphocyte clusters. The allergic variety of polyps also have similar histology, except for significant dominance of eosinophils. In our study, inflammatory polyps were seen in 68.8%, while allergic polyps were seen in 4.16% cases. As seen in Table II, this observation was comparable to those in other studies as well.

Fungal infections leading to mass like lesions in nasal and paranasal areas are also commonly seen. In our study, fungal elements were detected using PAS as a special stain. However, we did not do further categorization

of fungal species. Cumulative cases of fungal pathology comprised of 7 cases (7.29%), while Zafar et al reported them as 3.45% in his study⁵. Rhinosporidiosis (caused by *Rhinosporidium seeberi*) and Mucormycosis are believed to be the common fungal pathogens leading to nasal masses. Similarly, Rhinoscleroma is also a common non-neoplastic lesion which is characterized by presence of signature cells called Mikulicz Cells (foamy histiocytes) and plasma cells¹. We observed one such case in a 19-year-old male patient. Our incidence was lower than those seen in studies by Zafar et al⁵, Bijjaragi et al³, Dafale et al¹⁰ and Kuruba et al². Amongst other non-neoplastic lesions, we had 3 cases of non-specific granulomatous changes (non-tuberculous in origin) and one case of lepromatous leprosy.

The most common neoplastic lesion we observed was inverted papilloma, seen in 4 patients (4.19%). Inverted papilloma is a benign neoplastic lesion characterized by local invasion into the mucosa (endophytic growth) with higher rates of recurrence and nearly 10% chances of malignant conversion. Other studies by Bijjaragi et al³, Kuruba et al² and Dafale et al¹⁰ have reported inverted papilloma in the range of 3-4%. Hemangiomas are another common variety of neoplastic lesions. They were seen in 3.12% of our cases, 10.6% by Bijjaragi et al³ and 5.2% by Kuruba et al². Angiofibroma were seen in 3.12% of cases, almost near to 2.85% cases by Dafale et al¹⁰ and 3.31% cases seen in another study¹¹. Neurofibroma (male, 38 years) & Trichoepithelioma (male, 6 years) were the uncommon variety of benign lesions, similar to those seen in study by Bijjaragi et al³ and Shaila et al¹².

Overall, malignant lesions have been seen commonly in elderly age group, above the age of 50 years. The malignancies of sinonasal tract account for roughly 3-5% of all head and neck cancers, squamous cell carcinoma being the most common histological type^{2,13}. In the present study, two cases of malignant nasal masses were observed, namely undifferentiated nasopharyngeal carcinoma (female, 55 years) and sinonasal non-keratinized squamous cell carcinoma (female, 65 years). Dafale et al¹⁰ & Kulkarni et al⁹ also reported 2 cases of squamous cell carcinoma in their studies of 70 & 117 patients respectively. Likewise, Maru et al⁷ had 2 cases of nasopharyngeal carcinoma in his study of 70 patients, both being in sixth decade of life. However, two cases of malignant pathology in our study are not statistically significant to draw definitive conclusions and further studies or meta-analysis with larger sample size are warranted.

CONCLUSION:

Our study corroborated with the fact that non-neoplastic inflammatory polyps constitute the most common subtype of nasal and paranasal sinus polypoidal lesions. Although uncommon, polypoidal lesions also consist of various benign and malignant pathologies, which are difficult to distinguish on clinical grounds alone. Hence, histopathological analysis indeed plays a crucial role in subtyping such lesions and thereby helps in appropriate management and prognosis of the patient.

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