



A CROSS SECTIONAL STUDY ON HISTOPATHOLOGY OF NASAL MASSES IN A TERTIARY CARE CENTRE

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**ABSTRACT**

Sino nasal masses is a growth in the nasal cavity, nasopharynx, or the sinuses occurring in all age group and are commonly encountered in clinical practice. The main aim of this study is to identify the various diseases that present with Sino-nasal masses, to study their clinical presentations and histopathological pattern. And to know the distribution of these conditions among the different age and sex groups. A cross sectional study was carried out with the histopathological report of all the patients who underwent functional endoscopic sinus surgery for Sinonasal mass during the period December 2014 to December 2019. Total of 187 histopathological reports were analysed to study various histopathological patterns. Out of 187 patients sino nasal masses was more observed among male in 3rd decade of life. The lesions were categorized into non neoplastic 139 (74.3%), and neoplastic 48 (25.7%), among the non-neoplastic masses inflammatory nasal mass was found in 55 (29.4%), followed by allergic nasal mass in 52 (27.8%). The most common benign disease in our study was Inverted papilloma occurring 18 (9.6%) patients among 32 benign lesions reported. Malignancy was observed in 16 out of 48 (25.7%) neoplastic patients. Inflammatory nasal polyp is the most common disease in a patient presenting with Sino nasal mass. In our study most common benign tumor is inverted papilloma. The chances of malignancy increases as age progresses, most common malignancy is squamous cell carcinoma of nose. Hence histopathological evaluation is essential in deciding the further management of the disease.

**KEYWORDS :** Sinonasal mass; Histopathology; Rosai Dorfman disease; Pleomorphic adenoma; Olfactory neuroblastoma

**INTRODUCTION:**

Nose and paranasal sinuses form a single functional unit. In clinical practice, polypoidal lesions in the nasal cavity are most commonly encountered. Polyps are defined as edematous and hypertrophied nasal mucosa(1). These polyps occur in all age group but common in middle aged male. The incidence of these polyp ranges from 1% to 4 % among which neoplasm accounts for 0.2-0.8%. The most common presenting complaint is nasal obstruction followed by epistaxis, nasal discharge, anosmia, post nasal drip and others associated symptoms include allergy, headache, periorbital pain(2). The origin of Sino-nasal masses may be inflammatory, infective, neoplastic, congenital and traumatic. Allergy is found to be one of the major causes for the mass which is inflammatory in origin. Occupational exposure to wood dust, coal, leather, smoke etc are the predisposing factors for malignancy(3). Sino-nasal malignancies accounts for 3% of head and neck malignancy. It becomes important to obtain detailed history from the patient, thorough examination and prompt investigation should be ordered to achieve the diagnosis(4). Hence histopathological examination is essential to know about the nature of the mass and to decide upon the further management.

**AIMS AND OBJECTIVES:**

- To identify various diseases that present with Sino-nasal masses, to study their clinical presentations and histopathological pattern.
- To know the distribution of these conditions among the different age and sex groups.

**MATERIALS AND METHODOLOGY:**

This cross sectional study was conducted in the department of otorhinolaryngology at chettinad hospital and research institute from December 2014 to December 2019 after getting approval from the ethical committee. The study included a total of 187 samples of all the patients who underwent functional endoscopic sinus surgery for Sino-nasal mass.

After the procedure histopathological examination was done for each sample by first fixing them with buffered formalin (10%). Examination was done with hematoxylin & eosin stains and immunohistochemical study was done for specific cases. The relevant clinical details were obtained from the case records.

**RESULT:**

In this study, age distribution ranges from 8- 69 with mean age being 36 years (fig 1). Patients in third and fourth decades were affected more commonly with male:female ratio 1.17:1 (fig 2).

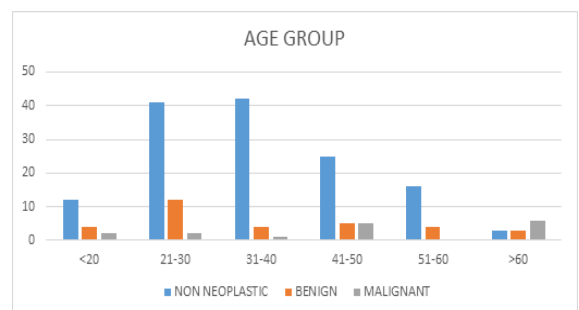


FIG 1 – AGE DISTRIBUTION

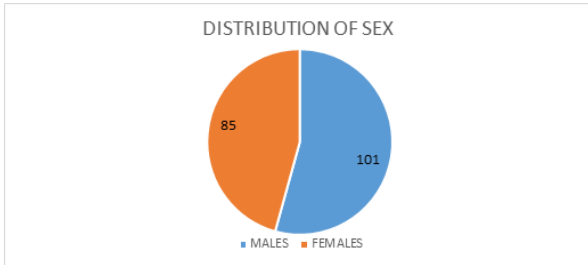


FIG 2 – DISTRIBUTION OF SEX

Regarding the occupation, 58 patients were housewife (31.0%) 44 patients were students (23.5%) 17 patients were carpenters with exposure to dust allergies (9.1%) 8 were farmers (4.27%) 7 were teachers (3.74%) and others were 53 (28.3%) (fig 3). Nasal obstruction was the most common presenting complaints in 98 patients (52.4%), followed by headache in 82 (43.9%) and nasal discharge in 74 patients (39.5%). Bleeding from nose, allergy, anosmia, post nasal drip and facial heaviness were the other symptoms (fig 4).

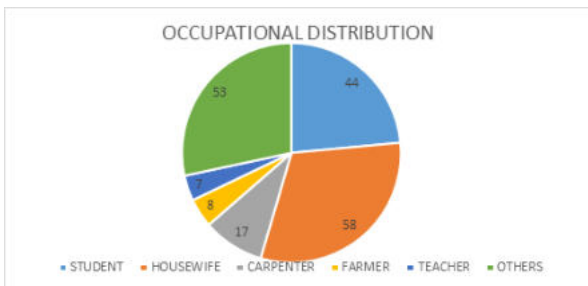


FIG 3 – OCCUPATIONAL DISTRIBUTION

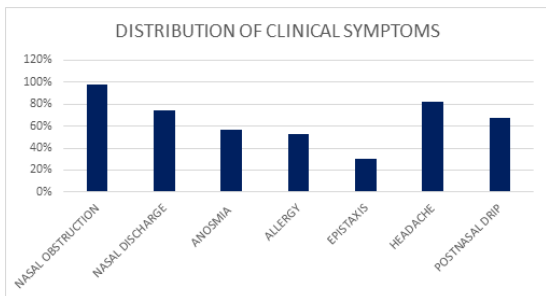


FIG 4 – DISTRIBUTION OF CLINICAL SYMPTOMS

Among 187 total cases based on histopathological examination, 139 (74.3%) were diagnosed non neoplastic and 48 (25.7%) neoplastic (fig 5).

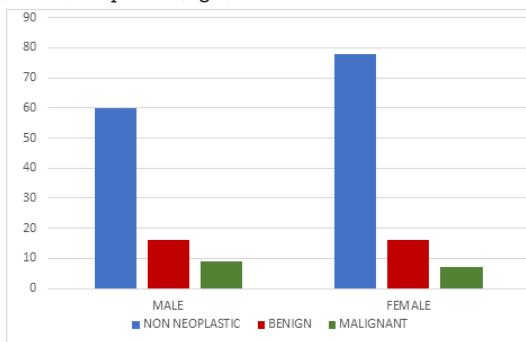
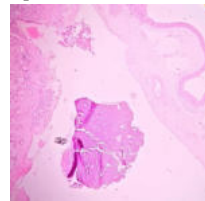


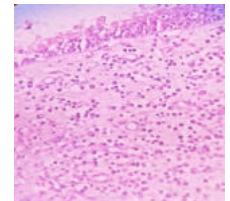
FIG 5 – TYPES OF LESIONS

In 139 non neoplastic cases, the most common lesion were inflammatory polyp with 55 cases (29.4%) followed by allergic inflammatory polyp in 52 cases (27.8%), fungal infection in 16 cases (8.6%), mucormycosis in 7 cases (3.7%), rhinosporidiosis in 6 cases (3.2%), and three cases of rhinoscleroma (1.6%).

Inflammatory polyps were the most common non neoplastic lesion noted in second and third decades of life. Most of the patients presented as bilateral condition with symptoms like nasal obstruction, anosmia, headache, allergy. Microscopically, these polyps contain loose mucoid stroma and mucous glands lined by respiratory epithelium. Stroma were infiltrated with inflammatory cells like Lymphocytes, plasma cells, neutrophils and eosinophils (pic 1). In allergic inflammatory polyp more eosinophilic cells were noted when compared with other inflammatory cells.



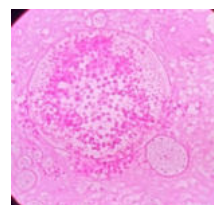
Pic 1 - Inflammatory polyp



Pic 2 - Allergic fungal polyp

Allergic Fungal polyp were seen in third and fourth decade of life with symptoms like foul smelling discharge, epistaxis, nasal obstruction and also with symptoms pertaining to complications of invasive fungal sinusitis like facial swelling, cranial nerve palsies, cavernous sinus thrombosis and visual disturbances like diplopia and proptosis. Microscopic examination showed inflammatory cells like neutrophils and histiocytes in the granulation tissue and they were confirmed by sabouraud's dextrose agar medium culture (pic 2). Aspergillosis was noted in nine cases and it is the most common fungal infection. Invasive fungus like mucormycosis were seen in seven cases (3.7%). All seven cases with fungal polyps were diabetic out of 55 diabetic patients (29.4%).

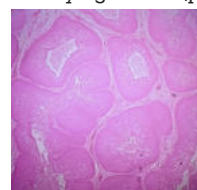
Rhinosporidiosis were seen in fourth and fifth decades of life. Numerous globular sporangia containing spores were identified on microscopic examination (pic 3). Rhinoscleroma caused by klebsiella rhinoscleromatis were seen in three cases with symptoms like nasal discharge, sinusitis, anosmia. Histological examination shows inflammatory cells like lymphocytes, plasma cells and diagnostic Mikulicz cells were present.



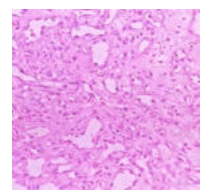
Pic 3 - Rhinosporidiosis

Out of 48 neoplastic lesions, 32 (17.1%) were benign and 16 (8.6%) were malignant lesions. Among the benign tumours, the most common benign lesion was inverted papilloma with 18 (9.6%) cases. Eight cases of capillary haemangioma (4.3%), three cases of juvenile nasopharyngeal angiofibroma (1.6%). One case of pleomorphic adenoma (0.5%), one case of schwannoma (0.5%), and one case of rosai dorfman (0.5%).

Inverted papilloma seen in second and third decade with nasal mass, unilateral nasal obstruction and bleeding from nose. Microscopically, the squamous epithelium invaginated the underlying stroma (pic 4).



Pic 4 – Inverted Papilloma

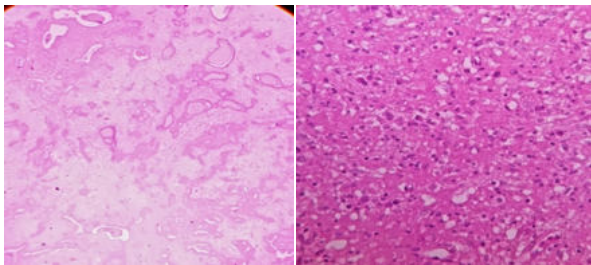


Pic 5 - Capillary hemangioma

Capillary haemangioma was seen in third and fourth decade especially among females. Epistaxis and unilateral nasal obstruction were the most common presenting symptoms followed by other nasal symptoms such as nasal discharge. On histopathological examination the capillaries are lined by flat epithelium separated by collagen stroma (pic 5).

Juvenile nasopharyngeal angiofibroma commonly seen in second decade of life predominantly in males with symptoms like epistaxis, unilateral nasal obstruction and nasal discharge. Histological examination reveals intricate mixture of blood vessels lined by single layer of endothelium and fibrous stroma.

Pleomorphic adenoma of nose a very rare condition seen in one case presented with unilateral nasal obstruction and occasional bleeding from nose. Microscopic examination revealed epithelial and myoepithelial component with tubular structures (pic 6). Immunohistochemical staining revealed strong vimentin in the myoepithelial cells and in mesenchymal components.



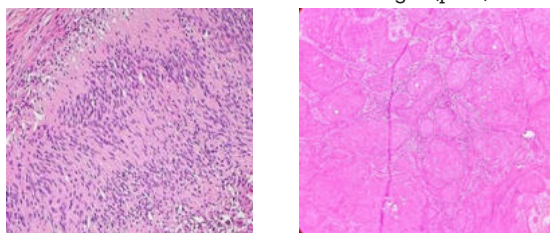
Pic 6-Pleomorphic adenoma

Pic 7- Rosai Dorfman disease

A case of Rosai Dorfman was seen in twenty-four-year-old male with nasal obstruction, headache and nasal discharge. On examination a smooth oval pinkish mass was present in the right nasal cavity between the inferior turbinate and nasal septum with lymph node involvement. Fine needle aspiration cytology of lymph node along with histopathological examination of nasal mass confirmed the diagnosis. Histological finding showed sinus histiocytes with lymphocytes known as emperipolesis (pic 7). This disease most commonly affects the lymph node and other extranodal sites like nasal cavity, paranasal sinuses, soft tissue, orbit, salivary gland and CNS. Other benign lesions, schwannoma seen in third to fourth decade presented with characteristic histological features of Antoni A and Antoni B in various proportion (pic 8).

Among the 16 malignant lesions, most commonly presented were squamous cell carcinoma with eight cases (4.2%) followed by five cases of adenoid cystic carcinoma (2.6%) and three cases of olfactory neuroblastoma (1.6%).

Squamous cell carcinoma the most common malignant tumour seen in sixth and seventh decade of life. On examination an ulceroproliferative mass was present in the nasal cavity which bleed on touch. Microscopic examination showed tumour cells in masses, nests or in groups with squamous differentiation like extracellular keratin pearls, intracellular keratin and intercellular bridges (pic 9).

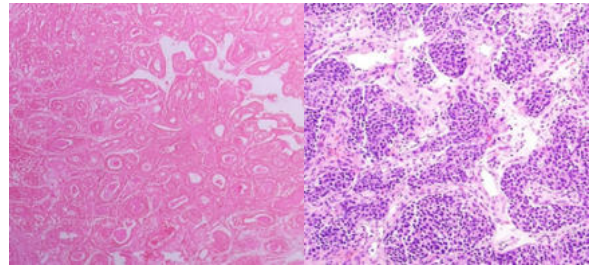


Pic 8-Schwannoma

Pic 9- Squamous cell carcinoma

Next, adenoid cystic carcinoma a rare malignant tumour in nasal cavity and paranasal sinuses. Common among 6th and 7th decades of life. Adenoid cystic carcinoma tends to spread locally by destroying bones, nerves and blood vessels. The classic patterns (cribriform and solid) were seen in histological findings (pic 10). Perineural invasion were identified in two cases.

Few malignant tumors are unique to sinonasal tract like olfactory neuroblastoma is a rare neuroectodermal malignant tumor. Also called esthesioneuroblastoma or esthesioneuroma. Though Olfactory Neuroblastoma occurs at any age group most common among 2nd and 6th decade of life. Commonly presented with symptoms like unilateral nasal obstruction and epistaxis and headache. Microscopically, circumscribed lobules or nests of tumor identified below an intact mucosa separated by fibrous stroma (pic 11). Immunohistochemistry were done in one case found to be positive for synaptophysin, chromogranin, CD56, S-100 Protein, NFP and neuron specific enolase.



Pic 10 - Adenoid cystic carcinoma

Pic 11- Olfactory neuroblastoma

**DISCUSSION:**

Nasal masses are very common lesions encountered in clinical practice and a variety of nonneoplastic and neoplastic diseases with a broad histopathological features are being observed. It is impossible to differentiate clinically and mostly they are diagnosed as simple polyps(5). These lesions are frequently neglected by the clinicians as infective or allergic etiology. Accurate diagnosis, prompt evaluation and treatment are delayed due to lack of differentiation of benign and malignant disorders at initial presentation(6).

In our study the predominant age of presentation was observed to be within 21-30 years with 55patients (29.4%) followed by 31-40 years in 47patients (25.1%) which was similar to the study done by Dinesh garg et al(7). The predominant age group for non-neoplastic, benign and malignant was 21-30 (21.9%), 21-30 (6.4%) and > 60 years (6.4%) were observed. The mean age for non neoplastic, benign, and malignant lesions was 39.1, 27.1, and 51 years in the observation made by Bist et al(8). In most of the studies the mean age was least for non neoplastic lesions followed by benign lesions and was highest for malignant lesions but in our study the least age was observed in benign lesions 21-30 years similar to bist et al and garg et al(7,8). The mean age was higher among 41-50 yrs in the study done by Agarwal et al(9). Male preponderance was observed more when compared with female in our study which was similar to somani et al, khan et al and patel et al(10,11,12).

Nasal obstruction was the most common symptom in the patients presenting with nasal mass. In our study, nasal obstruction was the first common symptom observed which was unilateral in 38.5% and bilateral in 61.5% followed by headache 43.9%, nasal discharge 39.5%, post nasal discharge 35.8%, anosmia 30.4 % and allergy 28.3%. In a similar study of sinonasal masses by Hummayun et al, the most common symptom was nasal obstruction (94%) followed by anosmia (68%) and epistaxis (50%) (13). Another study by Patel et al observed that the most common symptoms were

nasal blockage (71%), nasal discharge (54%), and swelling or mass (39%). Nasal obstruction was the most common symptom observed in other similar studies but the frequency of other symptoms varied (12,13).

In our study majority of the females were home maker 58 out of 187 (31%) followed by student 44 (23.5%) carpenter 17 (9.1%) and so on. In study conducted by Bakari et al and Sharma et al Students were affected more. Occupation remains one of the major etiological factors for Sino nasal masses both allergic as well as neoplastic (14,15). Carpenters, wood workers, leather factory workers are more prone for the development of Sino nasal malignancies. In a total of 187 patients non neoplastic nasal mass was the most common 139 (74.3%) followed by neoplastic 48 (25.7%). In our study among the non-neoplastic inflammatory polyp was maximum observed which was 55 (29.4%) out of 187 patients, followed by allergic inflammatory polyp 52 (27.8%), fungal polyp 16 (8.6%), mucormycosis 7 (3.7%), rhinosporidiosis 6 (3.2%), rhinoscleroma 3 (1.6%). Non neoplastic lesions were observed more which was similar to other studies (6,7,16,17). On histopathological evaluation the invasive fungal polyp was reported as mucormycosis. The fungal polyp presented with nasal symptoms and related complications like cranial nerve palsies and loss of vision (18). Rhinoscleroma is a non neoplastic lesion which manifested with nasal obstruction, foul smelling nasal discharge and crusting. Microscopically Mikulicz cells and plasma cells were predominant. Rhinosporidiosis presented as a polypoidal mass which bleeds on touch and examination showed there were numerous globular cysts representing thick walled sporangium containing numerous spores.

Neoplastic lesions were observed in 48 (25.7%) among which benign lesions were 32 (17.1%). Inverted papilloma was the most common benign lesion 18 (9.6%) followed by capillary hemangioma 8 (4.3%), juvenile nasopharyngeal angiofibroma 3 (1.6%) and one case of Rosai Dorfman disease, nasal schwannoma and pleomorphic adenoma of nasal cavity was observed. In Agarwal et al study of the 39 benign cases, hemangioma was the most common with 43.6 % of cases followed by inverted papilloma with 30.7 % of cases (9). In a study by N. Khan et al of the 56 cases of benign tumors, angiofibroma was 42.85 % followed by inverted papilloma (26.78 %) (11). Histopathological examination of nasal schwannoma revealed classical feature showing Antoni A and Antoni B areas with Verrocay bodies which was similar to study done by Aparna et al (17). Rosai-Dorfman disease is a rare disease with unknown etiology. Extra nodal involvement is most commonly seen in the head and neck region. Histopathologically, it is characterized by histiocytic cell proliferation (19).

Malignant lesions of sinonasal tract was observed in 16 cases (8.6%). Among the malignancy squamous cell carcinoma was observed to be the common 8 (4.2%) followed by adenoid cystic carcinoma 5 (2.6%) and olfactory neuroblastoma 3 (1.6%). Adenoid cystic carcinomas are more frequent than the usual adenocarcinomas and are aggressive tumors, but with a better outcome as compared to similar tumors arising elsewhere in the head and neck region (20). Olfactory neuroblastoma was observed in 3 (1.6%) cases out of 16 cases. It is a very rare uncommon malignant tumour of the olfactory nerve seen in the roof of the nasal cavity. Secondary meningitis, invasion through the cribriform area and distant metastasis are the causes for death in these patients (21,22). Most of these malignant tumors underwent surgery followed by radiotherapy.

#### CONCLUSION:

Sino nasal masses comprises a wide spectrum of common diseases like inflammatory, allergic and fungal polyps and

also rare diseases like pleomorphic adenoma, schwannoma and Rosai Dorfman disease in our study. Inflammatory polyps are most commonly encountered followed by neoplastic. Even with the history and examination, diagnostic endoscopy and various imaging, we can only come to differential diagnosis due to the overlapping presentations of various diseases. Histopathological examination is mandatory to confirm your diagnosis and plan definite management and further follow up of the patients.

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