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CLINICOPATHOLOGICAL STUDY OF SINONASAL LESIONS

Pathology

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ABSTRACT

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity and paranasal sinuses. Presenting symptomatology of all non-neoplastic, benign and malignant lesions is similar. Careful histological workup is essential for a correct diagnosis and timely intervention. This study is done in the Department of Pathology, Andhra Medical College, Visakhapatnam for a period of two years from July 2016 to June 2018. Biopsy samples received were routinely processed and stained. Out of total 75, 35 were non neoplastic lesions, 26 were benign and 14 were malignant. Most common age range noted was 41-50years with slight male predilection except in malignancies. Commonest clinical presentations are nasal mass and nasal obstruction. Commonest lesions in non-neoplastic, benign and malignant are inflammatory polyp, angiofibroma and squamous cell carcinoma respectively. Rare lesions like fibromyxoma, fibrous dysplasia, chordoma and chondrosarcoma were noted. Histopathological examination is diagnostic for polypoidal lesions of nasal cavity and paranasal sinuses.

KEYWORDS

Nasal Cavity, Paranasal Sinuses, Inflammatory Polyp, Malignancy

INTRODUCTION:

Nasal cavity and paranasal sinuses are collectively referred to as Sinonasal tract. They are exposed to various infections, chemical irritants, antigenically stimulating, mechanically or traumatic.[1] Sinonasal tract lesions are grouped into non-neoplastic and neoplastic lesions, the latter being also grouped into benign and malignant lesions.[2,3] The commonest non-neoplastic lesions are inflammatory polyps. The nasal cavity and the paranasal sinuses are very rare sites of origin of head and neck tumours. Neoplasms of nasal cavity and sinuses account for 0.2-0.8% of all neoplasms.[4,5] Benign tumours are more common than malignant tumours. The diagnosis of sinonasal malignancies is challenging. Not only are they rare, but also difficult to distinguish from their benign counterparts. Presenting symptomatology of all tumours is similar. The most common initial symptoms are nasal obstruction, nasal mass, epistaxis etc. Histopathological examination is compulsory to decide whether any particular mass in this region is malignant.[5] Thus, histopathological examination remains the mainstay for confirmation of diagnosis. Careful histological workup is necessary for a correct diagnosis and timely intervention.[3,5] Aim of our study is to know age, sex, site wise distribution and morphological spectrum of lesions in nasal cavity and paranasal sinuses.

MATERIAL AND METHODS:

It is a study done for a period of 2 years from July 2016 to June 2018 in the Department of Pathology, Andhra Medical College, Visakhapatnam. Biopsy specimens from patients of sinonasal masses with adequate tissue are included. Lesions from the nasopharyngeal region, lesion arising from the external nose and inadequate samples were excluded. The patients selected for this study were subjected to a detailed history, clinical examination and relevant radiologic investigations like CT scan Nose and PNS. Histopathological Examination of removed tissue either by biopsy or surgically excised specimen was carried out. The tissue is fixed in 10% formaldehyde, routinely processed and stained with Haematoxylin and Eosin (H & E).[6,7] In selected cases special stains like Periodic Acid Schiff (PAS)[6] and Acid Fast Bacilli (AFB)[8] were done.

RESULTS:

Study includes a total of 75 cases of sinonasal masses fulfilling inclusion criteria. Among them, 35 (46.7%) cases were non-neoplastic lesions and 40(53.3%) cases were neoplastic lesions which include 26 (34.7%) cases of benign lesions and 14 (18.6%) cases of malignant lesions. The age of presentation ranged from 10 years to 82 years. Most common age range noted was 21 to 40 years (40%). The lesions of nasal cavity and paranasal sinuses have slight predilection for males (53.3%) than females (46.7%) with ratio of 1.14:1. (Table 1)

Table 1: Age And Sex Wise Distribution Of Sinonasal Lesions

Age(years)	Male	Female	Total(%)
1–10	1	0	1(1.3%)
11–20	6	1	7(9.4%)
21–30	10	6	16(21.3%)
31–40	6	8	14(18.7%)
41–50	9	10	19(25.3%)
51–60	2	7	9(12%)
>60	6	3	9(12%)
Total	40	35	75(100%)

Most common site of origin for these lesions is Nasal cavity 60 cases (80%) followed by Paranasal sinuses 15 cases (20%). Nasal mass (100%) and nasal obstruction (81.3%) are the most common clinical presentations of all these lesions followed by nasal discharge (48%). (Table 2)

Table 2: Clinical Presentations Of All Sinonasal Lesions

S. No	Clinical presentations	Total no.ofcases	%
1.	Nasalmass	75	100%
2.	Nasalobstruction	64	85%
3.	Nasaldischarge	36	48%
4.	Epistaxis	29	38.7%
5.	Headache	30	40%
6.	Facialpain	24	32%
7.	Hyposmia/ Anosmia	20	26.7%
8.	Facialswelling	10	17.3%

Among 35 non-neoplastic lesions, most common age of presentation is 41-50yrs with strong predilection for males. Inflammatory polyp is the commonest non-neoplastic lesion constitutes 26 cases (74.5%). Other lesions are Rhinosporidiosis, Fungal infections and Granulomatous inflammation with each 3cases (8.5%). [Fig 1] Among 26 cases of benign lesions, more commonly seen in males with common age of presentation being 41-50yrs. Nasal mass, nasal obstruction and epistaxsis are the most common clinical presentations. Angiofibroma is the most common benign lesion with 9cases (34.7%) with age varied from third to sixth decade and male preponderance. Inverted papillomas are 4 cases (15.5%) with age varied from 5th to 9th decade

and all cases were males. Haemangioma are 4cases (15.5%) with common age of presentation 20-30yrs and male to female ratio is 1:1. Schwannoma are 2cases (7.7%) with age group of 3rd and 6th decade. One case of each Pleomorphic adenoma, fungiform papilloma, fibroepithelial polyp were noted. Rare benign tumours noted were meningioma, fibrous dysplasia, fibromyxoma and inflammatory pseudotumor with one case each. (Table 3) [Fig 2]

Table 3: Incidence Of Benign Lesions

S. No	Benign tumors	No. of cases	%
1.	Angiofibroma	9	34.7%
2.	Inverted papilloma	4	15.5%
3.	Hemangioma	4	15.5%
4.	Schwannoma	2	7.7%
5.	Fungiform papilloma	1	3.8%
6.	Fibroepithelial polyp	1	3.8%
7.	Pleomorphic adenoma	1	3.8%
8.	Meningioma	1	3.8%
9.	Inflammatory pseudotumor	1	3.8%
10.	Fibromyxoma	1	3.8%
11.	Fibrous dysplasia	1	3.8%
	Total	26	100%

Among 14 cases of malignant lesions, most common age group is 51-60yrs. These lesions have strong predilection for females than males. Most common malignant lesion is Squamous cell carcinoma with 4cases (28.7%). Next most common being Adenoid cystic carcinoma with 3cases (21.4%), Adenocarcinoma with 2cases (14.3%), Olfactory Neuroblastoma with 2cases (14.3%) and Sinonasal undifferentiated carcinoma one case (7.1%). One rare case of Chordoma, presented as nasal mass with age 55yrs and female sex and other rare case of Chondrosarcoma with age 45years and female with site of origin being maxillary bone. (Table 4) [Fig 3 & 4]

Table 4: Incidence Of Malignant Lesions

S. No	Malignant tumours	No. of cases	%
1.	Squamous cell carcinoma	4	28.7%
2.	Adenoid cystic carcinoma	3	21.4%
3.	Adenocarcinoma	2	14.3%
4.	Olfactory neuroblastoma	2	14.3%
5.	Sinonasal undifferentiated carcinoma	1	7.1%
6.	Chordoma	1	7.1%
7.	Chondrosarcoma	1	7.1%
	Total	14	100%

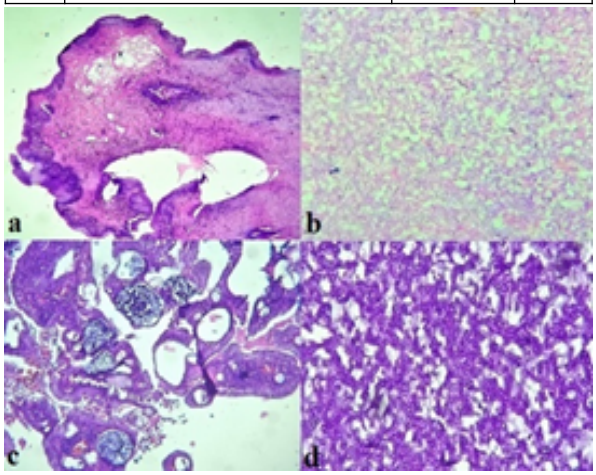
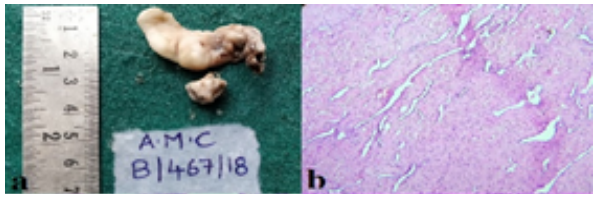


Fig 1: (a) Inflammatory Polyp (H & E, 40x) (b) Fungal Infections - Aspergillus With Narrow Septate Hyphae And Acute Angle Branching (H & E, 400x),(c) Rhinosporidiosis (H & E, 100x), (d) PAS Showing Aspergillus With Acute Angle Branching (PAS, 400x).



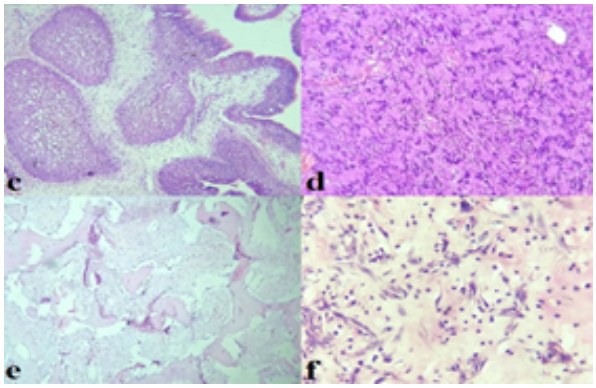


Fig 2: (a) Gross photograph of Excised specimen of Angiofibroma, (b) Angiofibroma (H & E, 100x), (c) Inverted papilloma (H & E, 100x), (d) Schwannoma (H & E, 100x), (e) Fibrous dysplasia (H & E, 100x), (f) Fibromyxoma (H & E, 400X).

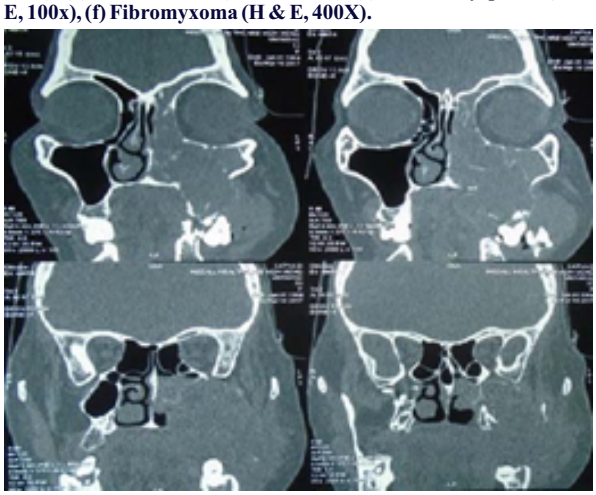


Fig 3: CT Scan Showing Mass In The Left Maxillary Sinus Of Chondrosarcoma Case

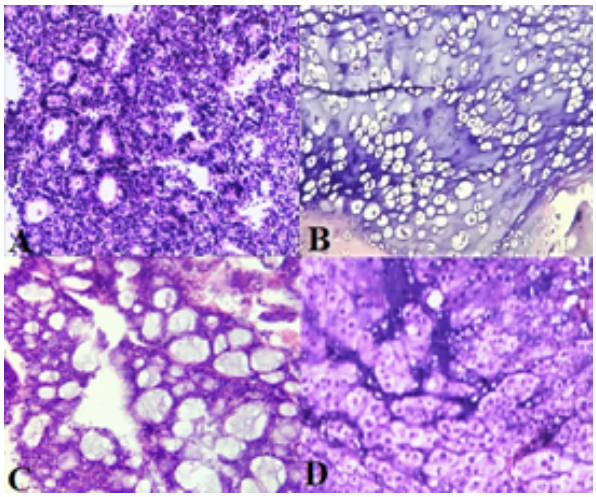


Fig 4: (A) Olfactory Neuroblastoma showing pseudorosettes (H & E,100x), (B) Chondrosarcoma (H & E, 400x), (C) Adenoid Cystic Carcinoma (H & E, 100x), (D) Chordoma showing tumour cells in sheets and cords with eosinophilic to pale vacuolated cytoplasm (H & E, 100x).

DISCUSSION:

Sinonasal masses form a complex group of lesions with a wide spectrum of histo pathological features which are similar clinically. While there are many non-neoplastic lesions, there is also good number of neoplastic lesions. [5,9] In present study, a total of 75 cases were included. Out of which 35(46.7%) cases were non-neoplastic lesions and 40 (53.3%) cases were neoplastic lesions. Studies done by Mamita et al [5], Bist et al [10] and Kulkarni et al [11] reported more non-neoplastic lesions than neoplastic lesions. Out of the neoplastic

lesions, incidence of benign tumors (34.7%) outnumbered the malignant tumours (18.6%) in the present study, which correlated well with that of Mamita et al.[5] (Table 5)

Our study includes cases as young as 10yrs and as old as 82 years of age. Highest incidence of sinonasal lesions were seen in the age group of 21 – 40years (40%) with similar results noted in the studies done by Mane et al [13] (52.4%) and Mamita et al [5] (45.6%). In present study, slight male predominance was noted with male to female ratio of 1.14:1, which is similar to the results of Agarwal et al [14] (1.2:1) and Mane et al [13] (1.3:1) studies. In this study, male preponderance in both non-neoplastic and benign lesions but female preponderance was seen in malignant lesions. Male to Female ratio for malignant lesions is 1:4 in the present study. All other studies show male preponderance for malignant lesions of sinonasal tract. This does not correlate with any other studies. Tobacco smoking and air pollution have been implicated in the pathogenesis of these malignant tumours. Female preponderance in the present study could be due to increase in smoking especially reverse smoking in females of these regions.

Table 5: Comparison Of Incidence Of All Non- Neoplastic, Benign And Malignant Lesions

S. No	Authors	Non neoplastic lesions	Benign lesions	Malignant lesions
1.	Humayun et al[12] (n = 50)	35 (70%)	3 (6%)	12 (24%)
2.	Kulkarni et al[11] (n = 117)	101 (86%)	13 (11.1%)	3 (2.9%)
3.	Mamita et al[5] (n = 134)	73 (54.5%)	38 (28.4%)	23 (17.1%)
4.	Bist et al[10] (n =101)	57 (56.4%)	20 (19.8%)	24 (23.8%)
5.	Present study (n = 75)	35 (46.7%)	26 (34.7%)	14 (18.6%)

n = total no. of biopsies

Out of total of 75 cases in this study, majority of the lesions were encountered in nasal cavity (80%) followed by paranasal sinuses (20%). It is in accordance with the studies conducted by Kulkarni et al [11], Shaila N Shah et al [15] and N.Khan et al [16] where nasal cavity is most common site for these lesions. The clinical presentation of sinonasal lesions depends on the primary site, the direction and extent of spread in malignancies. The initial presentations reported by the patients are diverse and for tumours it is similar.[5] Nasal mass (100%) and nasal obstruction (85.3%) were the most common clinical presentations followed by nasal discharge (48%). This correlates well with that of studies conducted by Mane et al[13] and Richa gupta et al.[17] Malignant tumours presented commonly with facial pain, facial swelling, hyposmia / anosmia compared with benign tumors. This is due to late presentation of most of the malignant tumours.

The maximum number of cases of non-neoplastic lesions was found in 21 – 40 years (42.8%) of age group in this study which closely correlates with that of Mane et al [13]. Inflammatory polyp (74.5%)) was the most common non-neoplastic lesions which were seen in 4th and 5th decade with male preponderance. The study conducted by Mamita et al[5]and Mane et al[13] showed majority of lesions among non-neoplastic lesions were inflammatory polyps. Rhinosporidiosis is a chronic granulomatous disease caused by Rhinosporidium seeberi.[18] Present study shows incidence of 8.5% of rhinosporidiosis in 2nd and 3rd decade with all male cases. This correlates with the study conducted by Bhattacharya et al [18] and Kulkarni et al.[11] This study showed 3cases (8.5%) of fungal infection, of which two were Mucor and one was Aspergillus and all cases are arising from paranasal sinuses. Morphological features were confirmed by doing special stains like McManus' PAS method.[6] We could not do the culture due to scanty material we received. 3 cases of nasal masses were reported as granulomatous inflammation after excluding other causes by doing AFB [8] and PAS [6] stains.

Majority of the benign tumours in the present study were found in the age group of 21 – 50years which coincides with the findings of Mane et al [13] and Bist et al.[10] The most common age group affected by the malignant lesions were 4th to 6th decade in the present study. Similar findings has been reported by Mamita et al [5]and Kulkarni et al.[11]

Present study included a total of 26 cases of benign tumours out of which Angiofibroma was the most common benign tumour with 9cases (34.7%) followed by Inverted papilloma (15.4%) and Hemangioma (15.4%) similar to the studies done by Kulkarni et al[11] and Guleria et al.[19] Angiofibroma showed peak age of presentation of 3rd and 5th decade in this study. But in studies conducted by Kulkarni et al [11] and Guleria et al, [19] common age of presentation is 2nd decade of life. Hemangioma with most common age group of 21 – 30 years, male to female ratio was 1:1. This is in accordance with studies done by Kulkarni et al [11] and Agarwal et al.[14] Other benign lesions in this study include Schwannoma (7.7%), fungiform papilloma (3.8%), Fibroepithelial polyp (3.8%), Pleomorphic adenoma (3.8%), and Meningioma (3.8%). Solitary Nasal Schwannomas are rare. Both cases of Schwannoma were females with young and elder age group similar to Kulkarni et al [11] and Guleria et al [19] studies. Meningioma has been presented as mass in the nasal cavity with age in 5th decade. Humayun et al [12] also reported one case of meningioma in there study with age of presentation being 14 years. Intranasal Pleomorphic adenomas present in the sixth decades of life with female preponderance which correlates with Guleria et al.[19] Very few studies showed Fungiform papilloma and Fibroepithelial polyp presenting as nasal mass which is similar to our study.

Rare benign lesions encountered in present study are fibrous dysplasia, fibromyxoma and inflammatory pseudotumor. Fibrous dysplasia is 7% of all facial bone tumors and rare in the nasal cavity. Ethamoid bone is the site of origin in our study. Other studies were fibrous dysplasia were seen are Zafar et al [20] and Bhatachaya et al [18] with site of origin being maxillary bone. Fibromyxoma was presented as nasal mass in young male. Subramaiam et al [21] also reported a case of 18yr old male with odentogenic fibromyxoma of the maxilla presenting as nasal mass similar to our study. Inflammatory pseudotumor is a benign tumor usually found in the orbits and lungs but it is rarely seen in sinonasal region. Present study encountered a 26year old female case with nasal mass.

Present study included a total of 14 malignant tumors, out of which 4 cases (28.7%) were Squamous cell carcinoma followed by three cases (21.4%) of adenoid cystic carcinoma. Results are similar to the studies conducted by Panchal et al[22], Bist et al[10] and Guleria et al[19]. Other malignant lesions include adenocarcinoma (14.3%), olfactory neuroblastoma (14.3%) and sinonasal undifferentiated carcinoma (7.1%) which correlates with other studies such as Bhattacharya et al [18], Guleria et al [19] and Panchal et al [22]. In present study we encountered two very rare malignant tumours, chordoma and chondrosarcoma. Primary Chordoma in the nasal cavity is an extremely rare tumors in the extraosseous axial skeleton. Unlike intracranial chordomas, lesions in these sites primarily present as a soft tissue mass without involvement of the skull base bone, so the clinical diagnosis is possibly difficult. [9] These tumors can be misdiagnosed clinically. Chondrosarcomas are rare in the jaw and facial bones and account for approximately3-4% of all chondrosarcomas. The maxilla and the nasal septum seem to be more frequently involved than the other maxillofacial bones.[9,23] In this study tumor is arising from maxillary sinus. Chordoma and Chondrosarcoma are extremely rare tumours in this region and in the present study they did not correlate with any other studies.

CONCLUSION:

Sinonasal lesions have various differential diagnoses. Nasal mass and nasal obstructions are the most common clinical presentations. Present study showed that the spectrum of lesions of sinonasal tract ranged from inflammatory to neoplastic lesions in various age groups ranging from 10 – 82 years with slight male preponderance. Inflammatory polyp is the most common sinonasal lesion with common age of occurrence during 5th decade of life. Benign conditions show a peak during 5th decade of life and most common benign lesion is Angiofibroma. With advancing age there is an increase in the incidence of malignancies with female preponderance. Squamous cell carcinoma is the commonest malignant tumour. Extremely tumours like Fibrous dysplasia, Fibromyxoma, Chondrosarcoma and Chordoma were reported in this region. Most of the non-neoplastic and benign neoplastic sinonasal lesions require surgical excision while malignant neoplastic lesions require wide surgical resection, radiotherapy or chemotherapy either alone or in combination. Thus histopathological examination is conclusive in diagnosing polypoidal lesions for distinguishing non-neoplastic and benign lesion from malignant tumours.

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