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Histopathological study of lesions of nasal cavity and paranasal sinuses in a tertiary care centre

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Abstract

Background: The present study was carried out for histopathological assessment of lesions of nasal cavity and Paranasal sinuses. Masses in nasal cavity form a heterogeneous group of lesions with a broad spectrum of histopathological features. Majority of the lesions at these sites is polypoid with less comman presentation being nodules, discharge or ulceration. Histopathological examination helps to assess the lesions and provide a clear understanding of their histopathological features, ultimately guiding management of patient.

Methods: A retrospective study of 150 biopsy specimens of nasal cavity and paranasal sinuses were studied. A detailed history of patients was taken with particular emphasis on demographic characteristics such as age, sex, clinical feature, other radiological investigation as well as macroscopic features of the tissue specimens. For histopathological examination specimen were fixed in 10% buffered formalin and then tissue was processed with automated tissue processor, sectioned and stained with Haematoxylin and Eosin stain, dried and mounted in DPX and Microscopic examination was done.

Result: In the present study of 150 cases, the majority 119 cases (79.3%) were diagnosed as non-neoplastic lesions, including 39 of fungal origin, 35 inflammatory polyps, 27 chronic non-specific inflammatory lesions, 14 acute inflammatory lesions, and a cases of Rhinosporidiosis, Epidermal inclusion cyst, Nasolabial cyst, and Mucocele. 31 cases (20.7%) were diagnosed as neoplastic lesions, consisting of 19 benign tumors and 12 malignant tumors. Among the malignant tumors, Squamous cell carcinoma was the most common, followed by adenocarcinoma. These study shows that, many different types of lesions can occur in the nasal cavity and paranasal sinuses, emphasizing the importance of accurate histopathological diagnosis for effective management.

Conclusion: The age group in this study ranged from 7 to 80 years. Inflammatory and tumor like lesions were seen in all age groups, while benign tumors showed a peak incidence in the 2nd and 3rd decade and malignant tumors were common in the 5th to 7h decade. Males were more commonly affected as compared to females. Inflammatory and tumor like lesions were the most common lesions occurring at these sites, followed by malignant tumors and benign tumors respectively.

Keywords: Nasal cavity, paranasal sinuses, squamous cell carcinoma, adenocarcinoma

Introduction

The nose and paranasal sinuses (PNS) form a complex system of airway [1]. It comprises of epithelial, glandular, lymphoid, fibrovascular connective tissue, cartilage and bony elements [2]. It is the site of origin of some of the more complex, histologically diverse group of lesions which causes problem in their diagnosis, prognosis and management because of certain unusual clinicopathological features. The lesions of nasal cavity and para nasal sinuses were first described by Hippocrates and Galen [3]. Lesions of nasal cavity are quite common. It can be neoplastic and non-neoplastic. Diseases of the nasal cavity include viral, bacterial and fungal infections, inflammations of the nasal mucosa and neoplasms. Clinical features like deviated nasal septum, common cold, nasal polyp, nose bleed, rhinitis and broken nose are common causes affecting nasal cavity. Nasal polyps are the most common cause of nasal obstruction [4]. Prevalence of sinonasal masses in the general population is 1 to 4% [5]. The presenting features, symptomatology and advanced imaging technique help to reach a presumptive diagnosis, but histopathological examination remains the mainstay of final definitive diagnosis and timely intervention [6].

Materials and Methods

A retrospective study of 150 formalin fixed biopsy specimens of nasal and para nasal sinuses were studied at Pathology department, B. J. Medical College, Civil Hospital, Ahmedabad, Gujarat, India, from January 2023 to December 2023. A detailed history of patients was taken with particular emphasis on demographic characteristics such as age, sex, clinical features, other radiological investigation and histopathological examination include macroscopic examination and microscopic examination with special stains if required. For histopathological examination, specimen were fixed in 10% buffered formalin and then tissue processed with automated tissue processor, blocks cut with microtome, section are made and and stained with Haematoxylin and Eosin stain. Microscopic examination was done and the findings were noted. Neoplastic lesions was classified based on The 2020 WHO classification.

Inclusion criteria: All specimen having nasal and paranasal sinuses lesions received at Histopathology section of pathology department, B.J. Medical College and Civil Hospital, Ahmedabad.

Exclusion criteria: All poorly preserved biopsy specimen were excluded from the study.

Results

In the present study, 150 cases of lesions in the nose and paranasal sinus were studied, revealing a predominance of non-neoplastic lesions (119 cases, 79.3%) over neoplastic lesions (31 cases, 20.7%). Neoplastic lesions consisted of 12 malignant cases (8% of total lesions, 38% of neoplastic lesions) and 19 benign cases (12.6% of total lesions). A mild male predominance (M:F=1.17:1) was observed in all lesions except malignant ones, which showed a 1:1 male-to-female ratio. Histopathological examination revealed fungal infections (Mucor) as the most common lesion (26%), followed by sinonasal polyps (23.3%). Angiofibroma was the most common benign neoplastic lesion (4%), while squamous cell carcinoma was the most common malignant lesion (4%). The study found that lesions of the sinonasal tract most commonly affected individuals in the 51-60 year age group (33 cases, 22%), followed by the 41-50 year age group (32 cases, 21.3%). Non-neoplastic cases predominantly affected individuals in the 41-50 year age group (27 cases, 22.7%). Benign lesions were most commonly observed in the third decade of life (5 cases, 26.3%), whereas malignant lesions were more prevalent in the 51-60 year age group (7 cases, 58.3%).

Figure with Legends

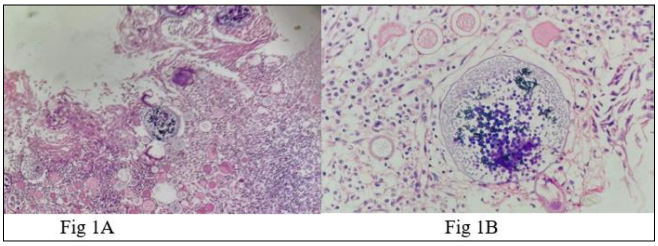

Fig 1: A (Low power, 10X) and Figure 1B (High power, 40X): Rhinosporidiosis (Haematoxylin-Eosin stain, 40X) shows histology of respiratory epithelium with presence of multiple, variable sized thick walled sporangia of rhinosporadium seeberi containing sporangio spores, surrounded by dense lymphoplasmacytic infiltrate.

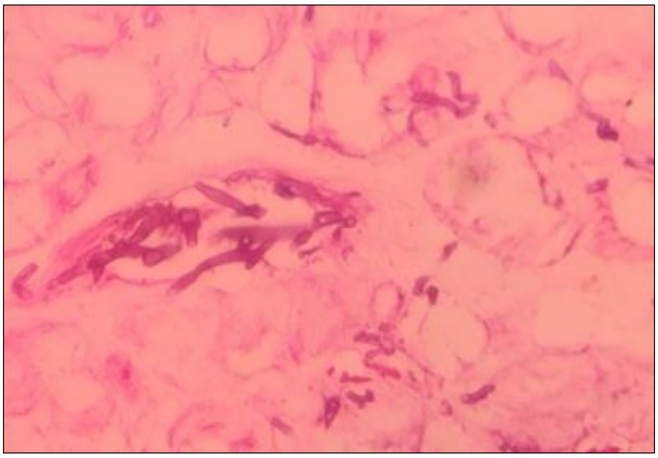

Fig 2: (High power, 40X) Mucormycosis- presence of a few fungal spores and hyphae having morphology of Mucor.

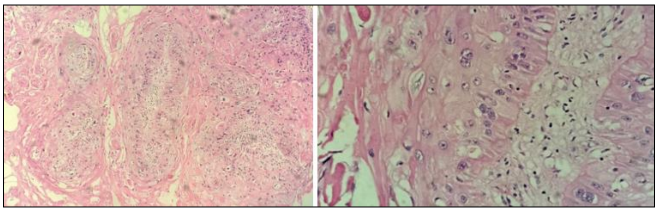

Fig 1 Fig 2

Fig 3A: (Low power, 20X) and Figure- 3B (High power, 40X) shows moderately differentiated squamous cell carcinoma, there is more obvious pleomorphism but the squamous nature of the tumor is still apparent.

Table 1: Age wise distribution of lesions

Age group	Non-neoplastic	Benign neoplastic	Malignant neoplastic	Total no. of cases	% of cases
0-10	1	0	0	1	0.6
11-20	7	4	2	13	8.6
21-30	12	5	0	17	11.3
31-40	18	3	0	21	14
41-50	27	3	2	32	21.3
51-60	23	3	7	33	22
61-70	22	1	1	24	16
>70	9	0	0	9	6
Total	119	19	12	150	100%

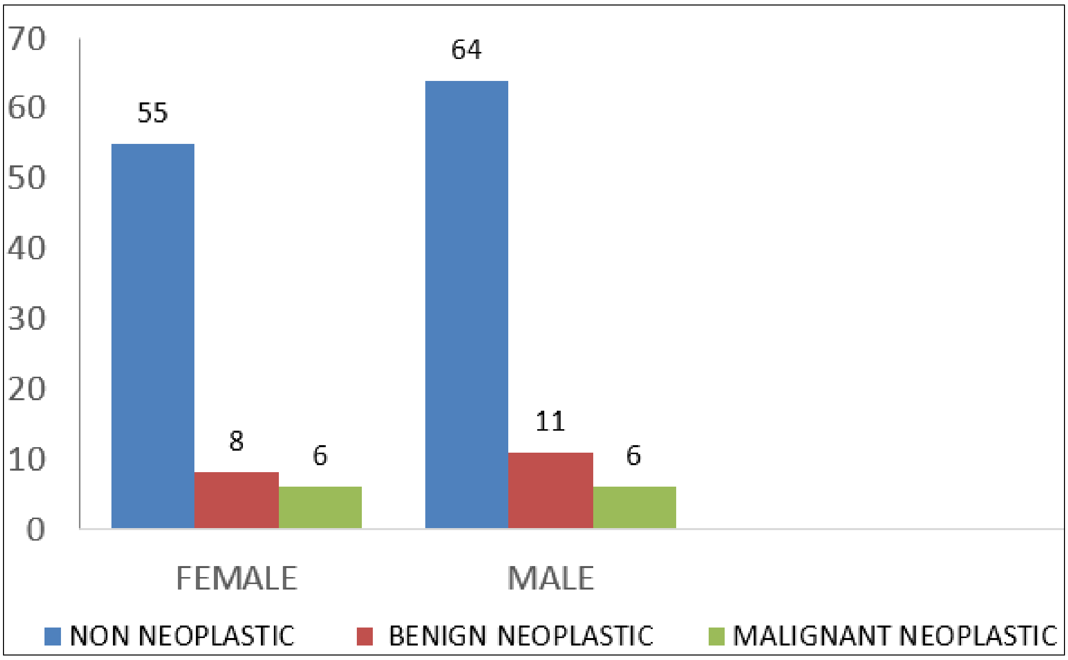

Table 2: Gender wise distribution of lesions

Table 3: Non-neoplastic vs neoplastic lesions

Type of lesion	Number of cases	% of cases
Non neoplastic	119	79.3%
Neoplastic- (Benign) (Malignant)	32 20 12	21.3%
Total	150	100%

Table 4: Types of non-neoplastic lesions

Non-neoplastic lesions	Number of cases	% of cases
Sinonasal polyp	35	29%
Fungal	39	33%
Rhinosporidiosis	1	1%
Epidermal inclusion cyst	1	1%
Chronic non specific inflammation	27	22%
Acute inflammation	14	12%
Naso labial cyst	1	1%
Mucocele	1	1%
Total	119	100%

Table 5: Types of benign neoplastic lesions

Benign neoplastic lesions	Number of cases	% of cases
Inverted papilloma	4	20%
Oncocytic papilloma	2	10%
Angiofibroma	6	30%
Hemagioma	1	5%
Fibro-osseous lesions	4	20%
Glomengiopericytoma	1	5%
Fibrous dysplasia	2	10%
Total	20	100%

Table 6: Types of malignant neoplastic lesions

Malignant neoplastic lesions	Number of cases	% of cases
Squmous cell carcinoma	6	50%
Adenocarcinoma	1	9%
T cell lymphoma	1	8%
Melanoma	1	8%
Meningioma	1	8%
Neuroblastoma	2	17%
Total	12	100%

Discussion

Present study's observations were found to be consistent with studies done by Sahoo AK and M Kulkarni A, where the non-neoplastic lesions (75& 69% respectively) were much more prevalent than neoplastic lesions [8]. The male to female ratio were also found to be similar in both their studies with slight male predominance. Study by M Kulkarni A, G Mudholkar V, S Acharya A, V Ramteke R. also showed male predominance [9]. Mucormycosis accounted for 33% of non-neoplastic lesions and was most common lesion whereas studies by M Kulkarni A. sinonasal polyps were most common lesions (69%) [9]. Sahoo AK, Sidam S, Chavan A. showed similar results to present studies with 40% of non-neoplastic lesions of being fungal infections [8]. In present study, nasal polyps were the second most common lesions. Out of 119 non-neoplastic lesions, 35 cases were of inflammatory polyp and 3 cases were Antrochoanal polyps, mainly presented in the second and third decade. The incidence of nasal polyps in our studies corresponds to the incidence of nasal polyps in studies carried out by Tandon. Allergic polyps were common as compared to inflammatory polyps in studies carried out by Tandon[11]. However, In our study, inflammatory polyps were common as compared to allergic polyps and constituted about 29%. Rhinosporidiosis was rare in our study, with only one case, consistent with reports by Ratnakar [12] and Makannavar [13]. Rhinosporidiosis is commonly encountered in the 1st to 3rd decade. In our study, it was encountered in the 3rd decade and occurred in male patients, which corresponds to the studies carried out by Ratnakar [12] and Makannavar [13]. In Benign lesions, there were 6 cases of nasopharyngeal angiofibroma. Out of the 6 cases, 4 cases were males and 2 cases were females. The age group was 1st and 2nd decade of life. In the present study, most common benign lesion was nasopharyngeal angiofibroma followed by 4 cases each of Inverted Papilloma and Fibro-osseous lesions. 2 cases each of Fibrous dysplasia, oncocytic papilloma and 1 case of Capillary Hemangioma. These findings correlated study of Khan *et al*. [14] and Kalpana Kumari KMK *et al*. [15] In the present study Malignant lesions were 12 cases, the most common malignant lesion was squamous cell carcinoma (6 cases) followed by 2 cases of neuroblastoma and is consistent with other studies of VikasDhillon and A.A vare [11].

Conclusion

In present retrospective study of sino nasal lesions we analyzed the various sinonasal masses histologically and observed their distribution among patients with respect to age and gender. The mean age of our study was found to be 48 years. Non-neoplastic lesions are the most common condition that affect the sino nasal region. Most common malignant lesion is squamous cell carcinoma and most common benign neoplasia is angiofibroma followed by inverted papilloma. Histopathology is the gold stander for the appropriate diagnosis of sinonasal lesions.

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Competing Interests: No conflict of interest.

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