



CLINICO-PATHOLOGICAL STUDY OF NON-NEOPLASTIC AND NEOPLASTIC LESIONS OF SINONASAL TRACT AND NASOPHARYNX

Pathology

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ABSTRACT

Introduction: A various non- neoplastic and neoplastic lesions of sinonasal tract and nasopharynx (NP) are commonly present in clinical practice. The aim of this study is to study clinical and histopathological patterns of lesions of sinonasal tract and nasopharynx in a tertiary care hospital over the period of January 2022 to June 2022. **Methods & Material:** This study of 121 cases (Male 82, Female 39) of nasal cavity, paranasal sinuses and nasopharynx over the period of 6 months. All received tissues after examination, fixed in 10% buffered formalin, processed and stained with Hematoxylin & Eosin to study histopathological patterns. **Results:** These nasal, paranasal and nasopharynx lesions were common in sixth and seventh decade of life. Among them 70 (57.85%) non neoplastic and 51 (42.14%) neoplastic lesions. Mucormycosis (23.96%) and polyps (17.35%) were the most common among the non- neoplastic masses; Inverted papilloma (2.47%) most common among benign neoplastic and squamous cell carcinoma (30.75%) was commonest out of all malignant masses. **Conclusions:** We concluded that complete clinical, radiological/imaging and histopathological helps to categorized lesions into various non-neoplastic and neoplastic types. But histopathological examinations provide a confirmatory diagnosis. Although immunohistochemistry is the final diagnostic method in few cases.

KEYWORDS

Sinonasal, Nasopharynx, Mucormycosis, Inverted Papilloma.

INTRODUCTION

- Nose is the most prominent part of face with great aesthetic significance and functional importance ⁽¹⁾. The nasal cavity and paranasal sinuses are collectively called as sinonasal tract ⁽²⁾. A various non-neoplastic and neoplastic conditions involving the sinonasal tract and nasopharynx are commonly present in clinical practice ^(1,2,4,5,6,8).
- The sinonasal tract forms a complex system of airway. It comprises of epithelial, glandular, lymphoid, fibrovascular connective tissue, cartilage as well as bony elements ⁽³⁾.
- The presenting symptomatology of all tumors is similar and using advanced imaging and CT/ MRI, a presumptive diagnosis is often made ⁽⁴⁾.
- Common presenting symptoms of sinonasal lesions are nasal blockage, epistaxis, nasal discharge, headache, facial swelling and ear symptoms ^(1,9). Patients with sinonasal tumors often present with nonspecific clinical symptoms and with advanced stage tumors and therefore have a poor prognosis ⁽⁷⁾. The non- neoplastic lesions are numerous, the morphologic variants of neoplasms are so many and they present as polypoid masses which are impossible to differentiated clinically ⁽⁶⁾.
- Sinonasal area is exposed to various infective agents, chemicals, antigens and many other influences. These exposures lead to formation of tumor like and neoplastic conditions ⁽²⁾. They can range from nasal polyps to infective polypoid granulomatous lesions to malignant lesions.
- Benign lesions of sinonasal region are common and lack of appreciation of these lesions can lead to radical surgeries. Cancers of the nose and paranasal sinuses account for less than 1% of all malignancies and about 3% of all head and neck cancers ⁽³⁾.
- Correlation of clinical, radiologic and most importantly pathologic modalities is of importance for accurate diagnosis ⁽⁸⁾. Clinical features and imaging techniques help in reaching a provisional diagnosis but histopathological examination remains the main stay for final definitive diagnosis ⁽¹⁰⁾. So, Careful histopathological examination is necessary to decide the nature of lesion ^(4,11).

AIMS

- The aim of study is to look for various masses arising from sinonasal tract and nasopharynx.
- To categorise these lesions into neoplastic and non-neoplastic masses.
- To study their clinical and histopathological patterns and their incidences.

MATERIALS AND METHODS

- This is a retrospective study of 121 cases, conducted in the Histopathology Section, Department of Pathology of Tertiary Care Hospital in Vadodra, Gujarat, for the period of January 2022 to June 2022. Demographic data regarding age, sex, complaints, clinical examination and radiological investigations was retrieved from histopathology section.
- The inclusion criteria for selection of cases was medically untreatable cases of masses in sinonasal tract and nasopharynx requiring surgical treatment and are fit for surgery.
- All the received biopsies were fixed in 10% buffered formalin. After routine gross examination and processing, Hematoxylin and Eosin staining for histopathological examination was done.

RESULT

1) Age Distribution

Of the 121 patients studied 32 patients (26.44%) fall in the age group of 61 to 70 years, out of them 23 were male and 9 were female and 21 patients (17.35%) fall in the age group of 51 to 60 years. The mean age of the patients is 45.5 years.

Table no.1: Age Distribution

Age	No. of Patients	Percentage	Male	Female
1-10 Years	5	4.13	3	2
11-20 Years	14	11.57	7	7
21-30 Years	14	11.57	9	5
31-40 Years	14	11.57	10	4
41-50 Years	18	14.87	13	5

51-60 Years	21	17.35	16	5
61-70 Years	32	26.44	23	9
70-80 Years	3	2.47	1	2
Total	121	100	82	39

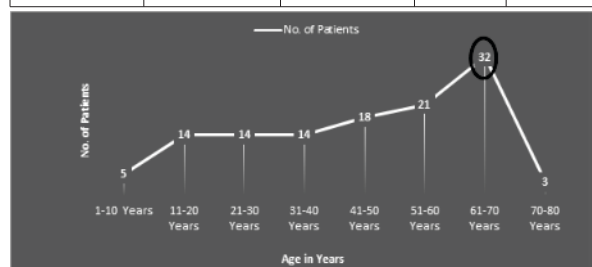


Figure no.1: Age Distribution

2) Sex Distribution

Of the 121 cases studied 82 (67.76%) patients were male and 39 (32.23%) were females with Male: Female ratio of 2.1: 1.

Table no.2: Sex Distribution

	No. of Patients	Percentage
Male	82	67.76
Female	39	32.23

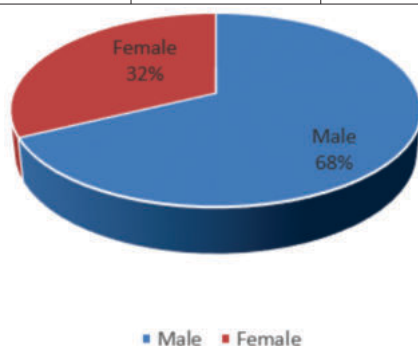


Figure no.2: Sex Distribution

3) Distribution Of Cases Of Nasal Cavity, Paranasal Sinuses And Nasopharynx According To Neoplastic And Non- Neoplastic Lesion

Diagnosis	No. of patients	Percentage
NON- NEOPLASTIC		
Mucormycosis	29	23.96
Mucormycosis + Aspergillous	03	2.47
Polyp (Inflammatory Polyp + Antrochoanal Polyp)	21 (13+8)	17.35
Rhinosinusitis	01	0.82
Tuberculoid Leprosy	01	0.82
Keratinous Cyst	01	0.82
Inflammatory lesion	14	11.57
TOTAL	70	57.85
NEOPLASTIC		
Squamous Cell Carcinoma	37	30.57
Inverted Papilloma	03	2.47
Tonsilloadenoid hypertrophy	01	1.65
Basal Cell Carcinoma	01	0.82
Juvenile Nasopharyngeal Angiofibroma	01	0.82
Adenoid Cystic Carcinoma	01	0.82
T-cell Lymphoma	01	0.82
B-cell Lymphoma	01	0.82
Round Cell Tumor	01	0.82
Mucoepidermoid Carcinoma	01	0.82
Sinonasal Sarcoma	01	0.82
Angioleiomyoma	01	0.82
Dysplasia/Atypical Squamous cells	01	0.82
TOTAL	51	42.14

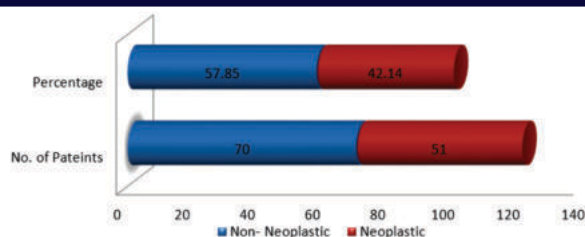


Figure no.3: Distribution of Neoplastic and Non-neoplastic lesions

4) Distribution Of Cases Of Nasal Cavity, Paranasal Sinuses And Nasopharynx According To Site

Site	No. of Patients	Percentage
Nasal & Paranasal	110	90.9
Nasopharynx	11	9.09

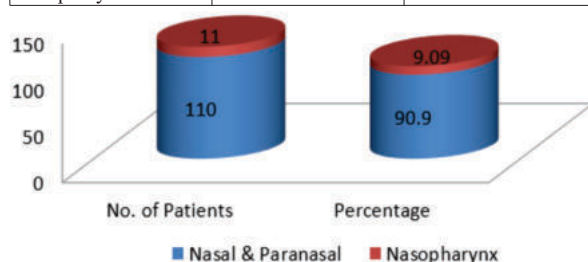


Figure no. 4: Distribution of Neoplastic and Non-neoplastic lesions according to site

Non- Neoplastic Lesion:

Non-neoplastic lesions/ tumor-like lesions formed 57.85% of the total cases of sinonasal tract and NP. Mucormycosis (Figure 1) were the commonest type of lesion encountered in this group with 29 cases (23.96%) followed by nasal polyps 21 cases (17.35%). Other lesions, in the descending order of frequency, seen were Inflammatory lesions, Mixed Fungal Infection (Figure 2), Rhinosinusitis, Tuberculoid Leprosy (Figure 3) and Keratinous cyst. The lesions have a wide range of age of presentation. The mean age of presentation in present study was 41.3 years. It shows male predominance with male to female ratio (M: F) being 1.5:1.

Neoplastic Lesion:

A total 51 cases which constituted 42.14% of all lesions were studied. Of 51 cases the commonest was of Squamous Cell Carcinoma (Figure 4), constituting 37 cases (30.57%); followed by inverted papilloma 3 cases (2.47 %) (Figure 5). Basal cell carcinoma (Figure 6), Juvenile Nasopharyngeal Angiofibroma (Figure 7), Adenoid Cystic Carcinoma, T-cell Lymphoma, B-cell lymphoma, Round Cell Tumor, Mucoepidermoid Carcinoma (Figure 8), Sinonasal Sarcoma, Angioleiomyoma and Tonsilloadenoid Hypertrophy were the other neoplastic lesions. The age of presentation of individual tumors was variable. The mean age of presentation in present study was 51.3 years. The M: F ratio was found to be 3.2:1. The majority of the patients with malignant lesions were present between the age of 41 to 70 years. The Sinonasal Sarcoma, Mucoepidermoid Carcinoma, T-cell Lymphoma and Angioleiomyoma were Immunohistochemistry (IHC) proven cases.

DISCUSSION:

Masses in sinonasal tract and nasopharynx form a heterogeneous group of lesions with a broad spectrum of histopathological features and pattern⁽¹⁾. These non-neoplastic and neoplastic lesions are impossible to differentiate clinically and they are mostly clinically diagnosed as nasal polyp⁽¹²⁾. They are frequently neglected by the clinicians as allergic and/or infective etiology. The lack of differentiation of benign and malignant disorders at initial presentation leads to significant delay in the diagnosis and treatment⁽¹⁾. Clinical features with imaging technique correlation gives a probable diagnosis, however histopathological examination of these lesions is essential for proper management⁽⁵⁾.

In present study, these masses had predilection for males demonstrating a male to female ratio of 2.1: 1 similar to a study by Zafar et al.⁽⁸⁾. A Nigerian study revealed female preponderance with opposite M: F ratio of 1:1.2⁽¹³⁾. The common presentation of sinonasal

masses were Nasal discharge, headache, nasal obstruction comparing favorably with other studies^(12,13,14).

Regarding age, current study revealed 6th and 7th decades of life were the most vulnerable period as observed by Gedam et al.⁽³⁾ and Patel et al.⁽¹⁵⁾, which concordance with Zafar et al.⁽⁸⁾ and Bakari et al.⁽¹³⁾.

In the study 57.85% lesions were non-neoplastic and 42.14% were neoplastic, which is more or less similar to those of Tondon et al.⁽¹⁶⁾, according to Tondon et al. study 74.61 % were non-neoplastic and 25.41 % were neoplastic.

Non-neoplastic Lesions:

Mucormycosis was the most common lesion observed in this present study, constituting 29 cases (23.96 %) of all non-neoplastic lesions. Compared with the study of Kalpana kumari et al. with 4 cases⁽¹⁷⁾, Kirdak V R et al. with 30 cases⁽¹⁸⁾, Hemant Chopra et al. with 4 cases⁽¹⁹⁾ and Gedam et al. with 4 cases⁽³⁾. Microscopy of mucormycosis cases show wide, ribbon-like filaments that generally do not have septa with necrosis and mixed inflammatory infiltrate. These Mucormycosis shows Periodic Acid-Schiff (PAS) stain positivity.

Polyp was the second most common lesion observed in present study. The majority of polyps were present in nasal cavity (15 cases, 71.42%) and only 6 cases, 28.57% involved sinuses. According to Tondon et al.⁽¹⁶⁾ and Anjali et al.⁽²⁰⁾ study 3.47% and 31.98% respectively, of all lesions of nasal cavity were polyps. In present study the age of presentation of polyp ranged from the very young to adults but the peak was seen in second and third decade of life which is similar to the findings of Tondon et al.⁽¹⁶⁾. The sex ratio in present study was 1.5:1; very close to study by Anjali et al.⁽²⁰⁾. The patients had a history of allergic rhinitis and the presenting features were blocking of nose and sinusitis.

Neoplastic Lesions:

The commonest benign tumor in present study was Inverted Papilloma and it accounted for 2.47% (3 cases) of all the benign lesions of NC, PNS and NP. The peak age of presentation was fifth to sixth decade of life and the all 3 cases were in male, which was similar to findings of Anjali et al.⁽²⁰⁾. Microscopy of Inverted Papilloma revealed invagination of squamous epithelium into the stroma.

Among all malignant cases Squamous Cell Carcinoma was the commonest in present study, constituting 37 cases (30.57%), which was more than Dinesh Garg et al.⁽¹⁾, Dr M Padma et al.⁽²⁾, Gedam et al.⁽³⁾, Nazoora Khan et al.⁽⁴⁾, Dr Cassandra carvalho et al.⁽⁵⁾, Sharma R et al.⁽¹⁰⁾ and Kalpana kumari et al.⁽¹⁷⁾.

A total 4 malignancies were subjected for Immunohistochemistry. All of them from Nasal Cavity masses and one each case of T-Cell Lymphoma, Sinonasal sarcoma, Angioleiomyoma and Mucocysticoid Carcinoma. IHC is used in present study for confirmation of diagnosis after histopathological examination on routine H & E stained sections. On routine examination Sinonasal Sarcoma and Angioleiomyoma were reported as Spindle Cell Carcinoma, T-cell Lymphoma as IgG4 related disease of nasal cavity NK/T-Cell Lymphoma and Mucocysticoid Carcinoma as High Grade Carcinoma with possibilities of Mucocysticoid Carcinoma or Acinic Cell Carcinoma.

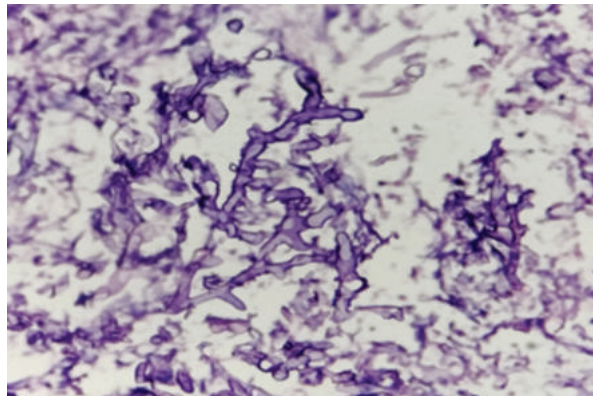


Figure 1: Photomicrograph shows Broad Aseptate Fungal Hyphae, Mucormycosis (H&E, 40x)

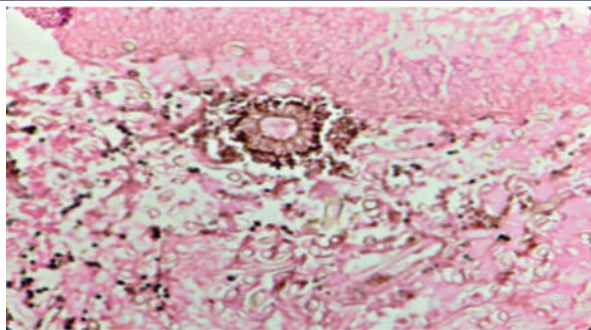


Figure 2: Photomicrograph shows Mixed Fungal Hyphae, Aspergillus & Mucormycosis (H&E, 40x)

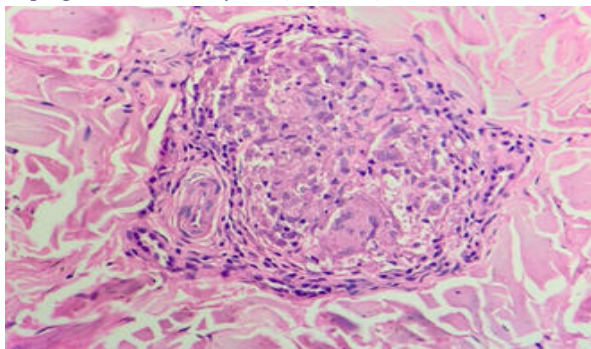


Figure 3: Photomicrograph shows Tuberculoid Leprosy, Granuloma (H&E, 40x)

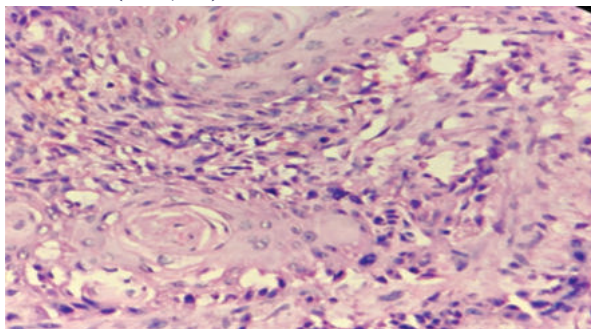


Figure 4: Photomicrograph shows Squamous Cell Carcinoma (H&E, 40x)

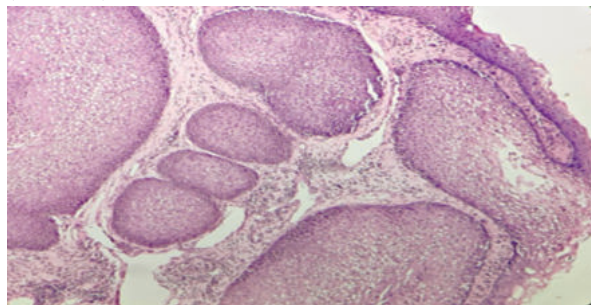


Figure 5: Photomicrograph shows Inverted Papilloma (H&E, 40x)

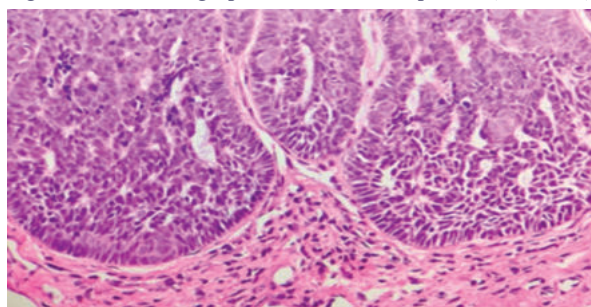


Figure 6: Photomicrograph shows Basal Cell Carcinoma with periphery palisading (H&E, 40x)

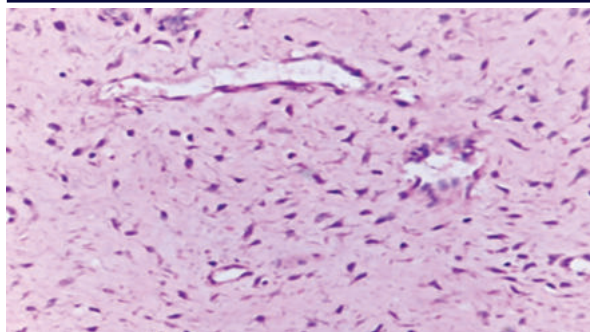


Figure 7: Photomicrograph shows Nasopharyngeal Angiofibroma (H&E, 40x)

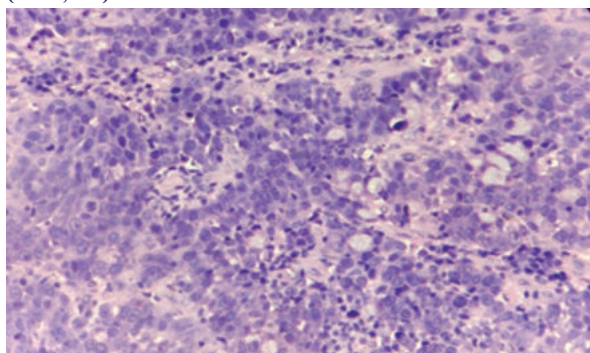


Figure 8: Photomicrograph shows High Grade Carcinoma, Mucoepidermoid Carcinoma (H&E, 40x)

CONCLUSION

Despite clinical diagnostic dilemma in the lesions of sinonasal tract and nasopharynx, histopathological examination is essential to differentiate various benign lesions from malignant tumors as the treatment modality varies. Routine H&E staining technique is a gold standard procedure, however Immunohistochemistry is mandatory in differentiating poorly differentiated or undifferentiated malignant tumors for proper diagnosis and management. Due to the overlapping presentation of lesions of this region with more commonly encountered inflammatory and infectious diseases, role of the histopathological examination needs to be understood. Correct diagnosis directs the clinician toward the proper and early management.

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