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Original Research Paper

Pathology

A STUDY OF HISTOPATHOLOGICAL SPECTRUM OF BIOPSIES FROM LESIONS OF SINONASAL TRACT RECEIVED AT TERTIARY CARE HOSPITAL OF WESTERN INDIA

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ABSTRACT

Background - Sinonasal tract is a collective term used for nasal cavity and paranasal sinus. A variety of inflammatory, non-neoplastic and neoplastic lesions involving nasal cavity, paranasal sinuses. Sinonasal lesions often present with overlapping symptoms some of them clinically mimic neoplastic conditions. **Aim** -To study Histopathological spectrum of biopsies from various lesions of sinonasal tract along with prevalence, age and gender wise distribution. **Method** –Retrospective observational study of total 104was conducted at Histopathology laboratory, Department from January 2022 to December 2023. **Result -** Total 104 cases were analyzed. Out of 91cases (87.5%) non-neoplastic, 07cases (6.7%) Benign and 06 cases (5.7%) were Malignant lesion. **Conclusion -** Sinonasal lesions show varied pathology with males more commonly affected. Non-neoplastic lesions predominated, nasal polyp being most frequent, while inverted papilloma and angiofibroma were notable benign neoplasms. Squamous cell carcinoma was the leading malignant lesion, mainly in middle-aged to older males. Clinical overlap makes diagnosis challenging, with histopathology remaining the gold standard for accurate classification, treatment guidance and prognosis.

KEYWORDS : Histopathology, nasal cavity, paranasal sinus, polyp, nasal papilloma, WHO

INTRODUCTION

The nasal cavity, paranasal sinuses and nasopharynx form a functional unit of nose.[1]Sinonasal tract is collective term used for nasal cavity and paranasal sinus. It comprises the nasal cavity, maxillary sinus, ethmoid sinus, frontal sinus and sphenoid sinus.[2]The nose is the most noticeable feature of the face, holding considerable aesthetic value and functional significance.[3]It is principally involved in filtering, humidifying and adjusting the temperature of inspired air.

The sinonasal tract is continually exposed to various allergens, pathogens, chemical and physical irritants, and other environmental factors. Due to these diverse influences, it is susceptible to a range of inflammatory conditions, infections, and neoplastic processes. Furthermore, the presence of specialized tissues within the sinonasal tract makes it vulnerable to both non-neoplastic and neoplastic lesions, including benign and malignant lesions. Inflammatory polyp is being the most common among non-neoplastic lesion with prevalence of about 4% in general population. The malignant lesions affecting nose and paranasal sinus account for <1% of all malignancies and about 3% of all head and neck malignancies.[4][5][6]

Sinonasal tract lesions can affect individuals of all age groupsand are commonly encountered in clinical practice.Non-neoplastic conditions include inflammatory and infectious diseases such as chronic sinusitis, nasal polyps, fungal infections, and granulomatous lesions.Benign neoplastic lesions, such as inverted papillomamay present with progressive nasal obstruction or localized mass effects. Although benign, some of these lesions carry a risk of recurrence or malignant transformation, necessitating close monitoring.Malignant neoplasms, including squamous cell carcinoma, represent the more aggressive spectrum of sinonasal pathology.[5]

Sinonasal lesions encompass a broad spectrum of pathological entities that frequently present with overlapping clinical features, including nasal obstruction, mucopurulent or blood-stained discharge, epistaxis, facial swelling, and extension into adjacent structures such as the orbit or ear. These nonspecific manifestations often mimic benign inflammatory conditions, thereby complicating clinical diagnosis. Although imaging and ancillary investigations may suggest a presumptive diagnosis, histopathological examination remains indispensable, serving as the gold standard for definitive diagnosis. The sinonasal tract, despite its limited anatomical confines, harbors a remarkably diverse range of neoplasms rendering this region diagnostically challenging and of considerable interest to histopathologists. Accurate tissue characterization through histopathology not only ensures diagnostic precision but also guides appropriate therapeutic strategies, underscoring its central role in the management of sinonasal lesions.

AIMS AND OBJECTIVE

The purpose of this study is to analyze the histopathological spectrum of biopsies from various lesions of the sinonasal tract. evaluate their prevalence, age and gender-wise distribution along with detailed descriptions of the histomorphological features.

MATERIALS AND METHODS

This is a Retrospective Observational Study which was conducted in the department of Pathology, GMERS Medical College and Hospital, Gotri, Vadodara. The study was done after getting approval from Ethics Committee. This study included sinonasal lesion cases received from January 2022 to December 2023.

A total of 104 sinonasal tract cases were studied during this period.

All the sinonasal tract lesion biospies were received and fixed in 10% formalin on the same day and were kept for fixation and all the tissue were processed in the tissue processor and paraffin blocks were made using Leukharts mold. Sections were taken with semi-automated rotary microtome having 3-5 microns thickness and slides were stained with Hematoxylin & Eosin routine stain.

These slides were then examined under a light microscope for a histopathological diagnosis. The histopathological diagnosis was based on morphologic features and the tumors were classified according to WHO classification.

All the collected data was charted in the Microsoft excel and descriptive analysis like percentage, mean and median were used in the present study.

ETHICS

This is a Retrospective, observational study and any intervention was not done. The study was undertaken after the Institutional Ethics Committee gave its approval.

RESULT

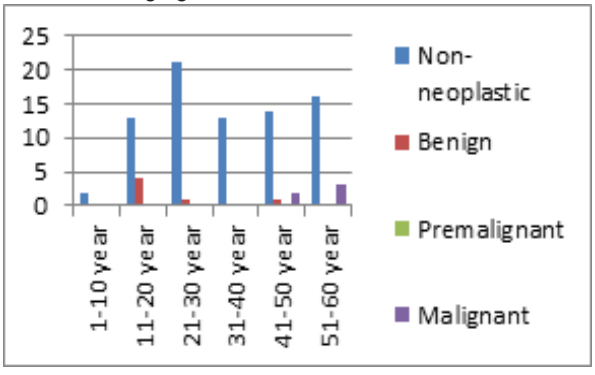
A total of 104 sinonasal biopsy specimens were evaluated. Of these, 91 cases were reported as non-neoplastic, while the remaining 13 case exhibited neoplastic features. Among the neoplastic lesions, 07 cases were identified as benign and 06 case as malignant.

According to data recorded, out of 104 cases, 64(61.53%) were male and 40(38.46%) females. For age wise distribution, it is evident that 55.75 % of total cases were recorded in 3rd, 5th, and 6th decade with highest incidence in 3rd decade which is 22 cases (21.15%). In present study, incidence in pediatric population was recorded low i.e. 1.9%.

Table 1: Distribution Of Sinonasal Tract Lesions Based On Age And Gender

Age group (years)	Male	Female	Number (%)
1-10	01	01	02 (1.9%)
11-20	09	08	17 (16.34%)
21-30	14	08	22 (21.15%)
31-40	08	05	13 (12.5%)
41-50	10	07	17 (16.34%)
51-60	14	05	19 (18.26%)
61-70	05	02	07 (6.7%)
71-80	03	04	07 (6.7%)
Total	64	40	104 (100%)

The data shows non-neoplastic inflammatory lesions occurring most frequently between the 3rd and 6th decades of life, with the highest prevalence 20.19% observed in the 3rd decade. Benign lesions were predominantly found in the 2nd decade (3.8%), whereas malignant lesions were more frequently seen in the 5th, 6th, and 8th decades, with incidences ranging from 0.9% to 2.88%.



Graph 1: Graphical Presentation Of Distribution Of Study Population Based On Age (X-axis) And Histological Finding (Y-axis)

The data shows Nasal polyp (47.25%) is most common lesion in this study as this followed by non- specific inflammation (38.46%), fungal inflammation (6.59%), chronic sinusitis (6.59%) and one case of rhinosporidiosis (1.09%) of total cases of non-neoplastic lesion. Inverted Papilloma being the most prevalent benign lesion, accounting for 57.14% of cases, followed by Angiofibroma (28.57%) and Haemangioma (14.28%). In the present study, Squamous Cell Carcinoma (66.66%) was identified as the most common malignant lesion in the nasal cavity and paranasal sinuses, followed by Nasopharyngeal Carcinoma (16.66%)

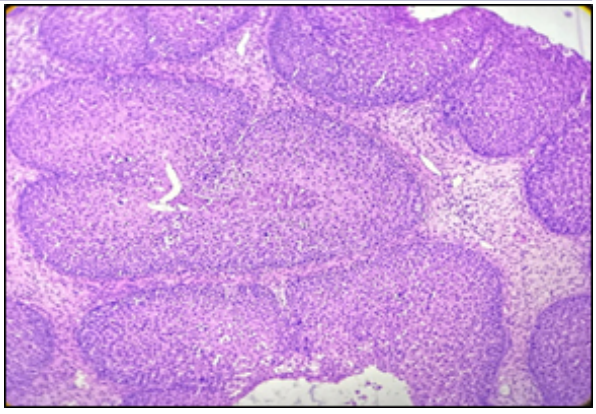


Figure 1: Inverted Papilloma (H & E stain 10X)

Table 3: More Frequant Sinonasal Lesion

Category	Lesion	Number(%)
Non-neoplastic	Nasal polyp	43 (47.25%)
Benign	Inverted papilloma	04 (3.84%)
Malignant	SCC	04 (3.84%)

DISCUSSION

In the present study, non-neoplastic lesions constituted the majority of cases (87.5%). This observation aligns with previous reports, where Sharma *et al.* found 90%, Nisha *et al.* reported 80%, and Regmi *et al.* and Gedam *et al.* documented similar prevalences of 66.08% and 66.14%, respectively. These findings collectively indicate that non-neoplastic lesions remain the most frequently encountered category in routine histopathological practice. In present study, nasal polyps were found in 47.25% of cases. Comparative studies have reported varying prevalence rates of nasal polyps. Kulkarni A et al. observed them in 85.72% of cases, SV Swami et al. in 65.9%.

In present study, four cases of inverted papilloma were observed, accounting for 3.84% of the total study population. This was slightly lower than the findings of Ruth Abera et al., who reported 26 cases (8.4%), as well as Kumar et al. and Khan et al., who documented five cases (5%) and five cases (8.06%), respectively.

In the present study, Squamous Cell Carcinoma (SCC) emerged as the most frequent malignant lesion, accounting for four cases (3.84%), followed by a single case (0.96%) of non-keratinized Nasopharyngeal Carcinoma. These findings were in line with previous studies. For instance, Swami et al. reported two cases (2.27%) of SCC and one case (1.13%) of Nasopharyngeal Carcinoma in their study population. Similarly, Regmi et al. observed an equal number of cases – twelve cases (3.03%) each - of both SCC and Nasopharyngeal Carcinoma.

Table 4: Comparison Of Present Study With Various Studies Of Sinonasal Tract Lesion

STUDY	Non-neoplastic	Benign	Malignant
Gedam, Et al [2]	66.14%	16.12%	19.35%
SharmaR et al. [3]	90%	3%	8%
Nisha et al [4]	80%	16.66%	3.33%
Regmi D, et al. [8]	66.08%	18.48%	18.48%
Present study	87.5%	6.73%	5.76%

CONCLUSION

Among neoplastic lesions, inverted papilloma was the predominant benign tumor, while squamous cell carcinoma was the most common malignancy. Males were more frequently affected, especially in malignant cases. Because sinonasal lesions often present with similar symptoms, histopathological examination remains essential for accurate diagnosis and appropriate management.

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