



A STUDY ON REACTIVE AND NON-INFLAMMATORY NON-NEOPLASTIC LESIONS OF THE NASAL CAVITY AND PARANASAL SINUS AT TERTIARY CARE HOSPITAL OF WESTERN INDIA

Pathology

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ABSTRACT

Background - The nasal cavity and paranasal sinuses collectively forming the sinonasal tract, are affected by a wide range of lesions across all age groups. Non-neoplastic conditions-including chronic sinusitis, nasal polyps, fungal infections and granulomatous diseases-are common and often present with overlapping symptoms that can mimic neoplastic processes. **Aim** -To study Histopathological spectrum of biopsies from various non-neoplastic lesions of nasal cavity and paranasal sinus along with prevalence, site wise, age wise and gender wise distribution. **Method**-Retrospective observational study of total 91 cases was conducted at Histopathology laboratory, Department from January 2022 to December 2023. **Result** - Among 91 cases, nasal polyps were the most common non-neoplastic lesion (43 cases, 47.25%), followed by non-specific inflammation (35 cases, 38.46%), fungal inflammation (6 cases, 6.59%), chronic sinusitis (6 cases, 6.59%), and rhinosporidiosis (1 case, 1.09%). Non-neoplastic lesions occurred predominantly in males (63.73%). The highest incidence in both sexes was observed in the third decade of life. Most lesions involved the nasal cavity, followed by the paranasal sinuses. **Conclusion**- The sinonasal tract, though anatomically small, gives rise to a wide spectrum of histologically diverse lesions. In this study, males were more frequently affected (male-to-female ratio 1.77:1). Non-neoplastic lesions predominated, with the nasal cavity being the most common site and nasal polyps the most prevalent lesion. Because many sinonasal lesions present with overlapping clinical features, histopathology remains essential for accurate diagnosis, appropriate management and prognosis.

KEYWORDS

Histopathology, nasal cavity, paranasal sinus, nasal polyp, mucormycosis, rhinosporidiosis

INTRODUCTION

The nasal cavity (NC) and paranasal sinuses (PNS) comprising the maxillary, ethmoid, frontal, and sphenoid sinuses—form a complex anatomical unit essential to both facial aesthetics and respiratory function.^[1] As the most prominent feature of the face, the nose not only shapes appearance but also plays a critical physiological role by filtering, humidifying, and thermoregulating inspired air.^[2]

Continuously exposed to a multitude of allergens, pathogens, and environmental irritants, the sinonasal tract is particularly vulnerable to a broad spectrum of disease processes. These range from simple inflammatory reactions to highly diverse neoplastic conditions. The region's specialized mucosa further predisposes it to both benign and malignant lesions, with inflammatory polyps representing the most common non-neoplastic entity and affecting approximately 4% of the general population.^{[2][3][4]}

Sinonasal lesions occur across all age groups and are frequently encountered in clinical practice. Non-neoplastic conditions, including chronic sinusitis,

nasal polyps, fungal infections, and granulomatous diseases, often present with overlapping symptoms such as nasal obstruction, nasal discharge, epistaxis, facial swelling, and occasional orbital or otologic involvement.^[5] These nonspecific manifestations frequently mimic benign inflammatory disorders, complicating clinical evaluation and delaying accurate diagnosis.

Although imaging and ancillary investigations may provide valuable clues, histopathological examination remains the cornerstone for definitive diagnosis. The sinonasal tract-despite its confined anatomical boundaries-harbors an exceptional diversity of neoplasms, making it a diagnostically challenging and intriguing site for pathologists. Accurate histological assessment not only ensures diagnostic precision but also guides optimal therapeutic decision-making, underscoring its indispensable role in the management of sinonasal diseases.^{[5][6]}

AIM AND OBJECTIVE:

The purpose of this study to analysed Histopathological spectrum of biopsies from various non-neoplastic lesions of nasal cavity and paranasal sinus along with prevalence, site wise, age wise and gender wise distribution.

MATERIAL 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 nasal cavity and paranasal lesion total 91 nasal cavity and paranasal sinus cases received from January 2022 to December 2023.

All the nasal cavity and paranasal sinus lesion biopsies 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.

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 were not done. The study was undertaken after the Institutional Ethics Committee gave its approval.

RESULT

A total of 91 sinonasal biopsy specimens were evaluated, all of which were reported as non-neoplastic lesions. These lesions occurred most frequently between the 3rd and 6th decades of life, with the highest incidence (20.19%) in the 3rd decade.

The majority of non-neoplastic lesions were found in the nasal cavity, followed by the paranasal sinuses.

Among the lesions, nasal polyp was the most common, accounting for 43 cases (47.25%). This was followed by non-specific inflammation with 35 cases (38.46%), fungal inflammation with 6 cases (6.59%), chronic sinusitis with 6 cases (6.59%), and one case of rhinosporidiosis (1.09%). Out of total 6 cases of fungal inflammation 4 case were mucormycosis and 2 case were aspergillosis.

Most non-neoplastic inflammatory lesions of nasal cavity and paranasal sinus were more common in male (63.73%). Highest number of sinonasal inflammatory lesions, in both male and females were noted in 3rd decade, frequency of which was 15.38% and 7.69% respectively.

Table-1: Non-neoplastic Lesion Of Sinonasal Tract Based On Histopathological Finding.

Histopathological diagnosis	Total cases	Percentage (%)
Non-specific inflammation	35	38.46%
Fungal inflammation	06	6.59%
Nasal polyp	43	47.25%
Chronic sinusitis	06	6.59%
Rhinosporidiosis	01	1.09%
Total	91	100%

Table- 2: Distribution Of Non-neoplastic Lesions Of Nasal Cavity And Paranasal Sinuses Based On Age And Gender In Present Study

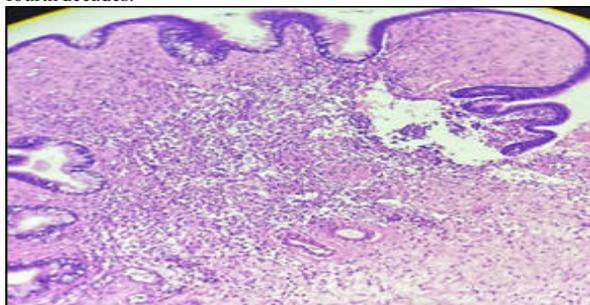
Age group (years)	Male	%	Female	%	Total case
1-10	01	1.09	01	1.09	02
11-20	08	8.79	05	5.49	13
21-30	14	15.38	07	7.69	21
31-40	08	8.79	05	5.49	13
41-50	09	9.89	05	5.49	14
51-60	11	12.09	06	6.59	17
61-70	04	4.39	02	1.09	05
71-80	03	3.29	03	3.29	06
Total	58	63.73	33	36.26	91

DISCUSSION

In the present study, most non-neoplastic and benign lesions were located within the nasal cavity, a finding consistent with the observations of Gedam et al.^[1] and Regmi D et al.^[7] Non-neoplastic lesions occurred predominantly in the third decade of life with a clear male predominance. Similar trends were reported by Kulkarni A et al.^[3] who also noted a higher incidence.

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Figure[1]: Inflammatory Polyp: Polypoidal structure lined by respiratory epithelium, underlying loose myxoid stroma, infiltrated by lymphocytes, plasma cells, neutrophils, and eosinophils(H&E, 10X)

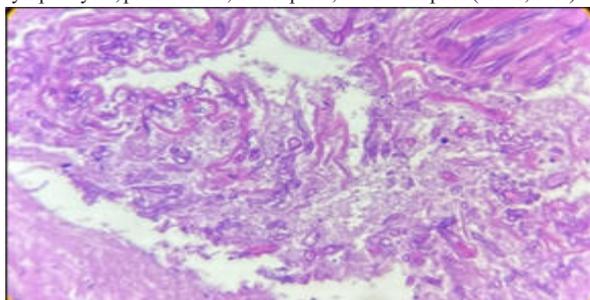


Figure [2]: Mucormycosis: Broad, non-septate hyphae and irregular branches (H&E, 10X)

Nasal polyps constituted 47.25% of cases in the current study. Reported prevalence rates vary across the literature, with Kulkarni A et al.^[3] documenting 85.72%, SV Swami et al.^[8] 65.9%, and Ruth Abera et al. 73%.

The prevalence of fungal inflammation also showed variation among studies. While Kulkarni A et al.^[3] reported a rate of 5.20%, SV Swami et al.^[8] noted 5.49%, and Ruth Abera et al. 3.2%, the present study recorded a slightly higher incidence of 5.76%. These differences likely reflect variations in environmental exposure, patient demographics, and diagnostic methods.

A single case of rhinosporidiosis (0.96%) was observed in this study. Comparative data show slight variations: Kulkarni et al. reported four cases (1.64%), SV Swami et al. recorded one case (1.09%), while Ruth Abera et al. documented a notably higher prevalence of nine cases (6.6%). These variations may be attributed to geographical, environmental, or demographic differences influencing disease distribution.

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