



## **Clinicopathological Challenges in Lesions of the Nasal Cavity and Paranasal Sinuses: Experience at a Tertiary Care Hospital**

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## ***Abstract***

***Background:*** The lesions of the nasal cavity and paranasal sinuses present problems in their diagnosis, prognosis, and management because of limited anatomical space and certain unusual clinicopathological features, so careful histological workup is essential for a correct diagnosis and to determine the extent of involvement and prompt treatment.

### ***Materials and Methods:***

The present study is a retrospective observational study for a period of two years, from 2022 to 2023, conducted in the department of pathology at Government medical college, Akola. A total of 45 cases were studied for histopathological examination. All relevant clinical details, tissue sections with haematoxylin & eosin and special stains were done whenever necessary.

***Results:*** A total of 45 cases were analysed. There was a slight male preponderance. The lesions were classified as non-neoplastic or neoplastic. Out of 45 cases, 31 (68.9%) were non-neoplastic nasal lesions, 9 (20%) were benign neoplastic lesions, and 5 (11.1%) were malignant neoplastic nasal lesions. Non-neoplastic lesions were more common than neoplastic lesions.

***Conclusions:*** Non-neoplastic lesions were more common than neoplastic lesions. Clinicians can thus better understand the clinical presentation, optimal management, clinical outcome, and prognosis of the disease by classifying sinonasal lesions based on histopathological features into distinct types.

***Key Words:*** Neoplastic, Nasal Obstruction, Polyp, Sinonasal

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## Introduction

The nasal cavity and paranasal sinuses, including the maxillary, ethmoid, sphenoid, and frontal sinuses, are collectively referred to as the sinonasal tract. [1] It comprises 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 that cause problems in their diagnosis, prognosis, and management because of certain unusual clinicopathological features. [3] It can be neoplastic or non-neoplastic. Neoplasms of the sinuses and nasal cavity account for 0.2-0.8% of all carcinomas. [4] The prevalence rate of nasal polyps is about 2%. [5] The main aim of this study was to study the spectrum of histopathological lesions of the nasal cavity and paranasal sinuses in a tertiary care hospital.

**Objectives:** To study the histomorphological features of lesions of the nasal cavity and paranasal sinuses.

**Aims:**

1. To study the incidence of benign and malignant lesions of the nose and paranasal sinuses (PNS).
2. To compare the findings of the study with the available data.

## Materials and Methods

The present study is a retrospective observational study for a period of two years, from 2022 to 2023, conducted in the department of pathology at Government medical college, Akola. A total of 45 cases were studied for histopathological examination. The relevant clinical details and radiological findings (x-ray, CT, and MRI) were obtained for clinic-pathological correlation. All the received biopsies were fixed in 10% buffered formalin, processed, embedded, and then stained with haematoxylin and eosin stains, dried, and mounted in Dibutylphthalate polystyrene xylene (DPX), and then microscopy was done. Special stains like Periodic acid-Schiff (PAS), Giemsa, Reticulin, Masson trichrome, and Congo red were used to confirm diagnosis wherever necessary. Statistical Analysis Results were tabulated, and data was analysed.

## Results

A total of 45 cases were studied in the present study for a period of 2 years, from 2022 to 2023. In the present study, the age of the patients ranged from 10 to 76 years. The maximum number of cases was 12 (26.6%)

seen in the age group of 31–40 years (4th decade), followed by 11 cases (24.4%) seen in the age group of 41–50 years.

In the present study of a total of 45 cases, males were 29 (64.4%) and females were 16 (35.5%). A male predominance was observed with a male-to-female ratio of 1.8-1.

According to the site, out of 45 cases, the maximum number of cases were seen in the nasal cavity (26 cases, 57.7%), followed by the paranasal sinuses (19 cases, 42.2%).

Out of 45 cases, 31 (68.9%) were non-neoplastic nasal lesions, nine (20%) were benign neoplastic lesions, and five (11.1%) were malignant neoplastic nasal lesions. Non-Neoplastic lesions: among the total 31 cases of non-neoplastic lesions, nasal polyps, with 18 cases (40%), was the most common type of non-neoplastic nasal lesion, followed by 9 cases (20%) of fungal infection. (Table no.01)

Out of a total of 9 cases of benign neoplastic lesions, 5 cases (11.1%) of inverted papilloma and two cases of schwannoma and nasolabial cyst each.

Among the total 5 cases, squamous cell carcinoma (4 cases, 8.9%) was the most malignant neoplastic nasal tumor observed in the present study, followed by 1 case (2.2%) of basal cell carcinoma.

Histopathological diagnosis	Number of cases	Percent (%)
<b>Non-Neoplastic Lesions (Inflammatory)</b>	<b>31</b>	<b>68.9%</b>
<b>Inflammatory polyp</b>	16	
<b>Allergic polyp</b>	02	
<b>Mucormycosis</b>	09	
<b>Rhinoscleroma</b>	02	
<b>Chronic rhinosinusitis</b>	01	
<b>Rhinosporidiosis</b>	01	
<b>Neoplastic (Benign) Nasal Lesions</b>	<b>09</b>	<b>20%</b>
<b>Inverted papilloma</b>	05	
<b>Schwannoma</b>	02	
<b>Nasolabial cyst</b>	02	
<b>Neoplastic (Malignant) Nasal Lesions</b>	<b>05</b>	<b>11.1%</b>
<b>Squamous cell carcinoma (SCC)</b>	04	
<b>Basal cell carcinoma (BCC)</b>	01	

**Table No 01:** Distribution of various lesions of Nasal cavity and Paranasal sinuses

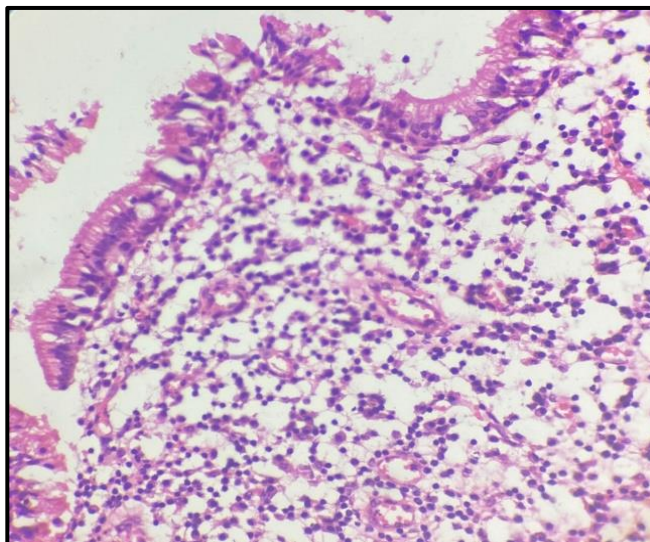
## Discussion

In the present study, the age of presentation has a wide range from 10 to 76 years. Maximum cases were reported in the age group of 31–40 years (4th decade), with 12 cases (26.6%), which is similar to studies conducted by Kulkarni A et al. [6] and Bandil S et al. [7]

In the present study, a male predominance was observed with a male-to-female ratio of 1.8:1, which is consistent with studies done by Dafale SR et al [8] (M:F ratio of 1.8:1) and Garg et al [9] (1.98:1).

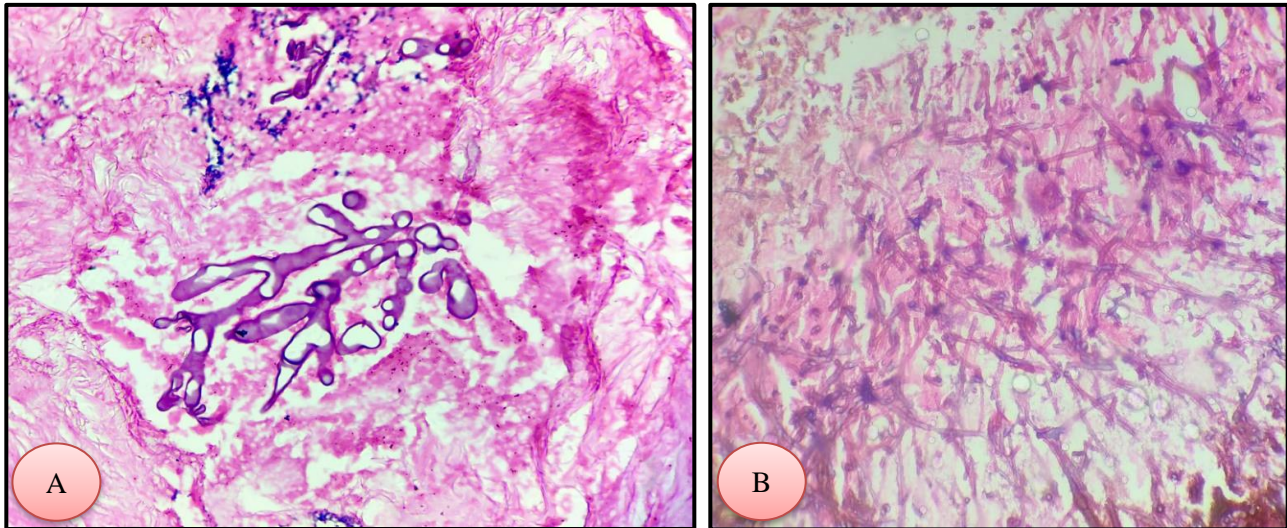
In our study, nasal lesions were more common in the nasal cavity (26 cases, 57.7%), followed by paranasal sinuses (19 cases, 42.2%). It is in accordance with a study done by Shaila N Shah et al [10] who observed maximum cases in the nasal cavity (60%), followed by PNS (25%).

In our study, out of 45 cases, 31 (68.9%) were non-neoplastic and 14 (31.1%) were neoplastic nasal lesions. This is similar to the study done by Bandil S et al [7] who reported 82 non-neoplastic and 31 neoplastic lesions out of 108 lesions. Out of total 13 neoplastic nasal lesions, 9 (69.2%) were benign, and 5 cases (38.4%) were malignant neoplastic lesions. This correlates with the study done by Anjali Dasgupta et al [11] (75.9 % benign and 24.1% malignant). Polyp (18 cases, 58.0%) was the most common non-neoplastic lesion. This is in agreement with studies conducted by Anjali Dasgupta et al [11] (62.8 %), Kulkarni et al [6] (69.3 %) and Dafale SR et al [8] (66.13%). On examination, polyp was a glistening grape-like mass, sensitive to probing, and did not bleed on touch. The histological study of inflammatory polyps showed a loose mucoid stroma and mucous glands covered by respiratory epithelium. The stroma was infiltrated by lymphocytes, plasma cells, neutrophils, and eosinophils. (Fig.1)



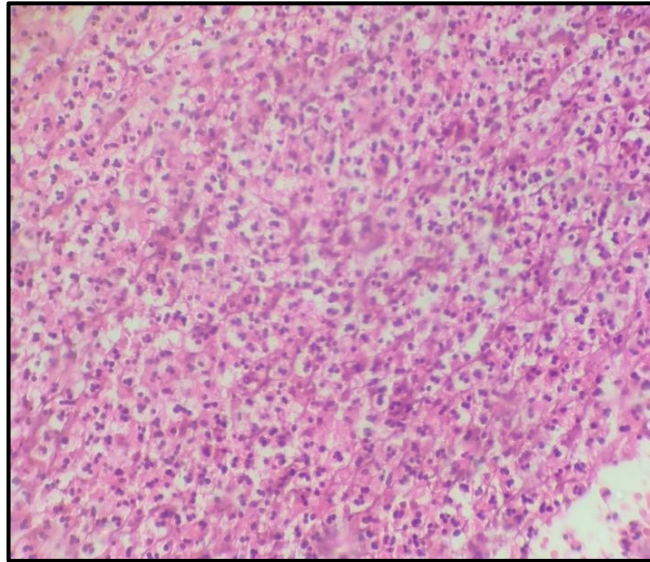
**Fig: 1** Allergic polyp. Polyp lined by respiratory epithelium with stroma showing dense inflammatory infiltrate (H & E stain,40X)

In non-neoplastic lesions, nine cases of fungal infection were observed, of which eight were mucormycosis and one was aspergillus. They presented with foul-smelling nasal discharge. Microscopy of mucormycosis showed broad, aseptate, pale ribbon-like hyphae with ninety-degree branching (Fig 2A). Whereas aspergillus showed thin, slender, septae with acute angle branching. (Fig.2B)



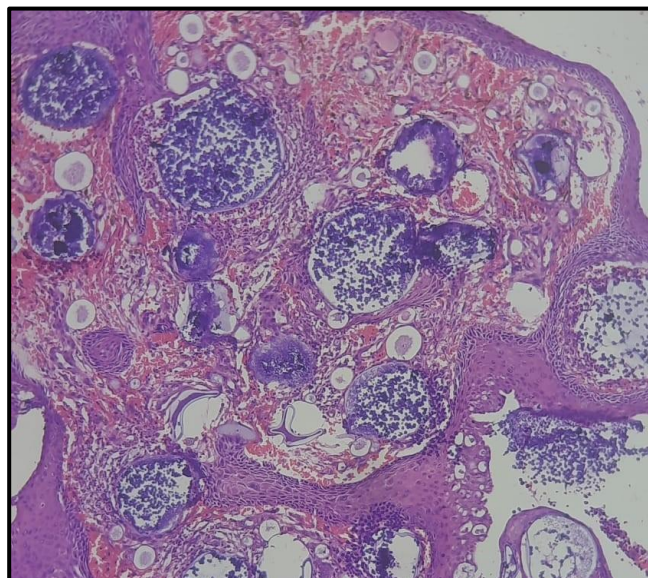
**Fig: 2 A.** Mucormycosis showing a broad and ribbon like hyphae with 90 angle irregular branching  
**B.** Aspergillus showing a narrow tubular septae with dichotomous branching arising at acute angles (PAS stain, 40X)

In our study, 2 cases (4.4%) of rhinoscleroma were seen with a male predominance. Microscopically, pseudoepitheliomatous squamous hyperplasia with foamy macrophages (Mikulicz cells), plasma cells with Russel bodies and granulomatous inflammation. (Fig.3)



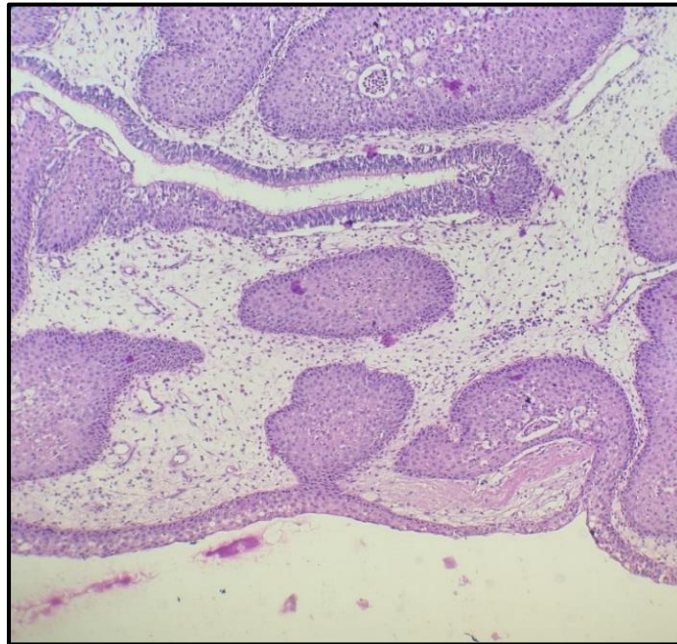
**Fig: 3.** Rhinoscleroma- foamy macrophages (Mikulicz cells containing bacteria) (H & E stain,40X)

In the present study, 1 case (2.2%) of rhinosporidiosis showed well-defined, thick-walled, circular structures corresponding to sporangia with internal endospores with mixed inflammatory infiltrate. (Fig 4)



**Fig: 4** Rhinosporidiosis showing Squamous epithelium and stroma showing sporangia of varying sizes containing numerous endospores (H & E stain,10X)

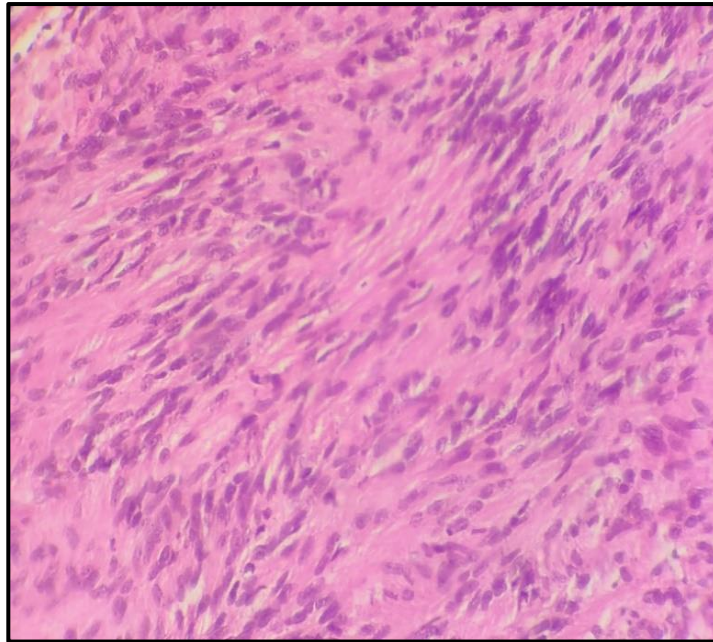
In our study, 5 cases (11.1%) of inverted papilloma on microscopy showed endophytic growth of epithelial nests with smooth outer contour with hyperplastic epithelium and transmigrating neutrophils are also seen. (Fig. 5).



**Fig: 5** Inverted papilloma- photomicrograph showing endophytic growth of epithelial nests (H &E stain,10X)

In our study, we encountered a rare case of schwannoma in a 48-year-old male patient. On microscopy shows biphasic tumour with compact Antoni A areas and myxoid hypocellular Antoni B areas. Nuclear palisading around fibrillary process (Verocay bodies) is also seen. This is similar to the studies done by Kulkarni et al [6]. (Fig 6)

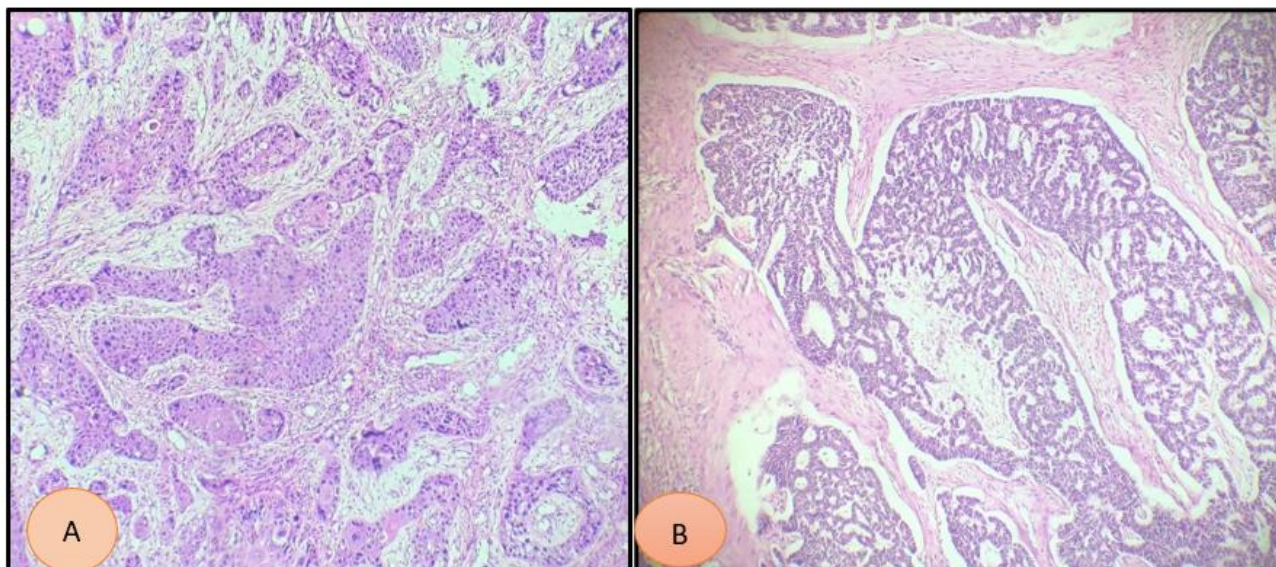




**Fig: 6** Schwannoma, photomicrograph showing Antoni A and Antoni B areas with verocay bodies  
(H & E stain,40X)

In the present study, out of 5 malignant tumors, squamous cell carcinoma, with 4 cases (8.8%), was the most common malignant nasal tumor. This correlates well with other studies conducted by Panchal et al study.[12] microscopic pictures of squamous cell carcinoma showed a tumor composed of cells arranged in nests, sheets, clusters, and discretely with few keratin pearl formations and desmoplastic stromal reactions. Tumor cells showed moderate pleomorphism with a hyperchromatic nucleus. (Fig 7A)

In our study, we found 1 case (2.2%) of basal cell carcinoma on microscopy, showing proliferation of nests of small basal cells with high N/C ratio with peripheral palisading arrangements and retraction clefts. (Fig 7B)



**Fig 7 A:** Squamous cell carcinoma - Stroma showing nests of dysplastic squamous cells **B:** Basal cell carcinoma - photomicrograph showing basaloid cells with peripheral palisading arrangement with retraction clefts (H & E stain, 10X)

## Conclusion

The nasal and paranasal lesions most commonly affect the age group of 31–40 years, with male preponderance seen in 64.4% of cases. Inflammatory nasal polyp is the most common non-neoplastic condition, affecting both males and females; Inverted papilloma is the most common benign neoplasm; and squamous cell carcinoma is the most common malignant neoplasm.

We concluded that complete clinical, radiological, and histopathological correlation helps us categorize these sinonasal lesions into various non-neoplastic and neoplastic types. Among all the investigations, histopathological study remain the gold standard for a definitive diagnosis and timely intervention.

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