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Nasal Polypoidal Lesions: Histopathological Evaluation and Diagnostic Spectrum at a Tertiary Care Institute

[1]Dr. Dhanshree Lahoti*, [2]Dr. Sadhana Mahore
[1]Junior Resident, [2]Professor,
Department of Pathology,
NKP Salve Institute of Medical Sciences and Lata Mangeshkar Hospital, Nagpur.

***Corresponding Author:**
Dr. Dhanshree Lahoti
Junior Resident, Department of Pathology,
NKP Salve Institute of Medical Sciences and Lata Mangeshkar Hospital, Nagpur

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Abstract

Introduction: Polypoidal lesions in the nasal cavity are very common lesions encountered in clinical practice. This lesion can result from various neoplastic and non-neoplastic conditions. Clinically, it can be challenging to differentiate between non-neoplastic and neoplastic (both benign and malignant) polypoid neoplasms. Therefore, histopathological evaluation of all nasal polypoidal lesions is essential to establish an accurate diagnosis and initiate appropriate treatment.

Purpose: The objective of this study was to evaluate the histopathological spectrum and diagnostic spectrum of nasal polypoidal lesions at a tertiary care institute.

Methods: The study included 50 consecutive cases of polypoidal lesions in the nasal cavity that were received by the pathology department over the course of one year.

Observations and Results: Histopathological analysis of 50 consecutive cases clinically diagnosed as nasal polyps revealed that 31 cases (62%) were non-neoplastic lesions, while 19 cases (38%) were neoplastic lesions. Of the neoplastic lesions, 17 (89.5%) were benign, and 2 (10.5%) were malignant. The benign spectrum included capillary haemangioma, angiofibroma, inverted papilloma and schwannoma. Malignant cases included poorly differentiated carcinoma and chondrosarcoma. Non-neoplastic and benign tumors occurred more frequently in the younger and middle-aged groups, while malignant tumors occurred in older men.

Conclusion: Polypoidal growths in the nasal cavity vary widely, ranging from benign inflammatory lesions to potentially fatal carcinomas. Therefore, an accurate histopathological diagnosis is crucial for effective patient management.

Keywords: Polyps, Nasal cavity, Histopathology, Nonneoplastic, Neoplastic

Introduction

Polypoidal lesions in the nasal cavity are very common lesions encountered in clinical practice. They are essentially rounded projections of oedematous membrane above a mucosal surface and projects into lumen, most often originating from the nasal cavity and ethmoidal sinus [1]. Patients may exhibit symptoms such as nasal obstruction, nasal discharge, epistaxis, diminished sense of smell, and allergic reactions like sneezing or rhinorrhea [2]. The nasal environment is exposed to various harmful agents including allergens, infections, and physical trauma, all potentially contributing to the development of tumor-like or neoplastic lesions. Clinically, it can be challenging to differentiate between inflammatory conditions presenting as simple polyps, polypoid lesions associated with specific diseases,- and

polypoid neoplasms (both benign and malignant) [3]. Hence, it is crucial for all polyps and polypoid lesions to undergo histopathological evaluation to establish a precise diagnosis and recommend appropriate treatment. This study focused on exploring the histopathological spectrum of polypoidal lesions in the nasal cavity at a tertiary care hospital.

Materials And Methods

This study was conducted at the Pathology Department of a tertiary care hospital from February 2023 to February 2024. The study included 50 patients spanning all age groups and genders, and it was conducted as an observational study. After approval from our Institutional Ethical Committee, and informed consent from all participants, biopsies, either incisional or excisional, were performed, and the collected tissues were subjected to histopathological examination. All specimens were fixed in 10% formalin and stained with Haematoxylin and Eosin (H&E); special stains were applied as necessary. Data analysis utilized descriptive statistical methods such as percentages and proportions.

Results

Histopathological examination of 50 consecutive cases diagnosed clinically as nasal polyps revealed that 31 cases (62%) were identified as non-neoplastic lesions, whereas 19 cases (38%) were classified as neoplastic lesions. Out of the neoplastic lesions, 17 (89.5%) were identified as benign, while 2 (10.5%) were classified as malignant.

Non-neoplastic lesions (31 cases) were the most frequent encountered in this study. They were categorized into inflammatory polyps and allergic nasal polyps. Among inflammatory nasal polyps, there were 10 females & 16 males, while allergic nasal polyps were observed in 2 females & 3 males. These conditions were predominantly found in younger patients aged between 11 and 45 years.

In benign neoplastic lesions, haemangioma was the most common, observed in 7 cases, followed by inverted papilloma with 6 cases, angiofibroma with 3 cases, and schwannoma with 1 case. All benign lesions occurred predominantly in males. Among the malignant lesions identified, there was 1 case of poorly differentiated carcinoma and 1 case of chondrosarcoma. These malignant lesions were observed specifically in elderly males.

TABLE 1- VARIOUS TYPES OF NASAL POLYPOIDAL LESIONS

Sr. No	Types of lesions	No. of cases	Percentage (%)
NON-NEOPLASTIC LESIONS			
1.	Inflammatory polyp	26	52
2.	Allergic polyp	5	10
NEOPLASTIC LESIONS			
A) Benign			
1.	Haemangioma	7	14
2.	Angiofibroma	3	6
3.	Inverted Papilloma	6	12
4.	Schwannoma	1	2
B) Malignant			
1.	Poorly differentiated malignancy	1	2

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2.	Chondrosarcoma	1	2
	Total	50	100

TABLE 2- GENDER WISE DISTRIBUTION OF LESIONS

Sr. No	Types of lesions	Males	Females	Total
NON-NEOPLASTIC LESIONS				
1.	Inflammatory polyp	16	10	27
2.	Allergic polyp	3	2	5
NEOPLASTIC LESIONS				
A) Benign				
1.	Haemangioma	4	3	7
2.	Angiofibroma	3	0	3
3.	Inverted Papilloma	4	2	6
4.	Schwannoma	1	0	1
B) Malignant				
1.	Poorly differentiated malignancy	1	0	1
2.	Chondrosarcoma	1	0	1
	Total	33	17	50

TABLE 3- AGE WISE (YEARS) DISTRIBUTION OF LESIONS

Sr. No	Types of lesions	0-10	11-20	21-30	31-40	41-50	51-60	61-70	Total
NON-NEOPLASTIC LESIONS									
1.	Inflammatory polyp	3	4	6	3	4	4	2	26
2.	Allergic polyp	0	1	2	1	1	0	0	5
NEOPLASTIC LESIONS									
A) Benign									
1.	Haemangioma	0	0	1	3	2	1	0	7

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2.	Angiofibroma	0	1	1	0	1	0	0	3
3.	Inverted Papilloma	0	0	1	2	2	1	0	6
4.	Schwannoma	0	0	1	0	0	0	0	1
B) Malignant									
1.	Poorly differentiated malignancy	0	0	0	0	0	0	1	1
2.	Chondrosarcoma	0	0	0	0	0	0	1	1
	Total	3	6	13	9	10	6	4	50

Histopathological Evaluation

FIGURE 1- Inflammatory polyp: It shows loose, edematous stroma infiltrated by a mixed population of inflammatory cells, including lymphocytes, plasma cells, neutrophils, and a few eosinophils. (10x magnification; hematoxylin and eosin stain)

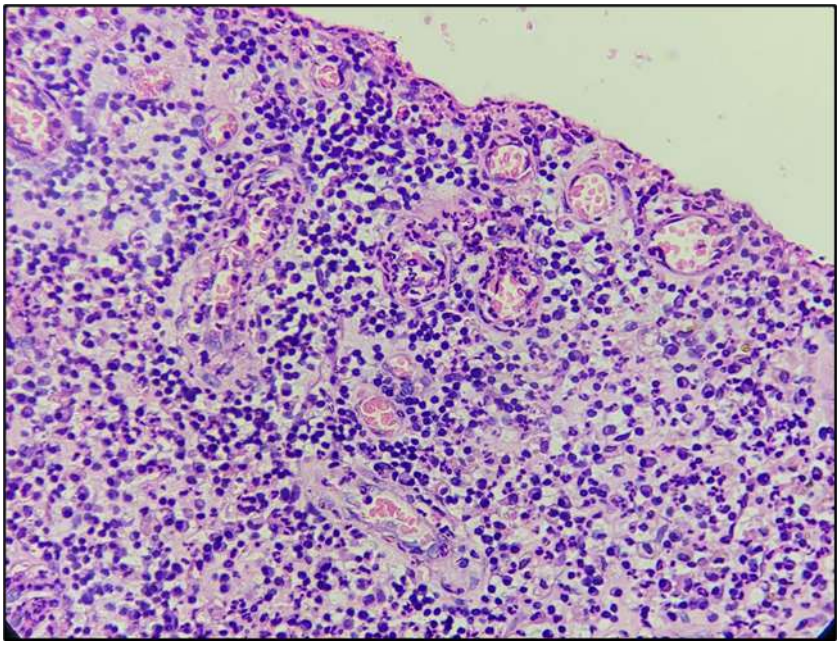

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FIGURE 2- Hemangioma: Varying sizes of vascular spaces lined by plump endothelial cells filled with red blood cells are seen. Intervening connective shows lymphocytic inflammatory infiltrate. (10x magnification; hematoxylin and eosin stain)

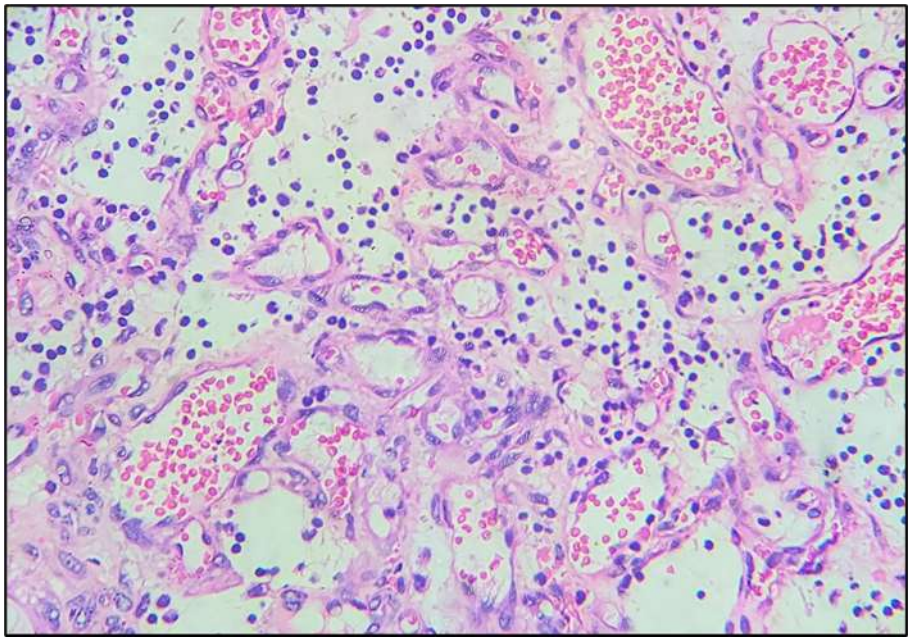

FIGURE 3- Angiofibroma: Many irregular, thin-walled blood vessels within a fibrous stroma are seen. The vessels lack an elastic lamina and smooth muscle. The stroma contains spindle-shaped cells with uniform nuclei and scant cytoplasm, without nuclear atypia or increased mitotic activity. (10x magnification; hematoxylin and eosin stain)

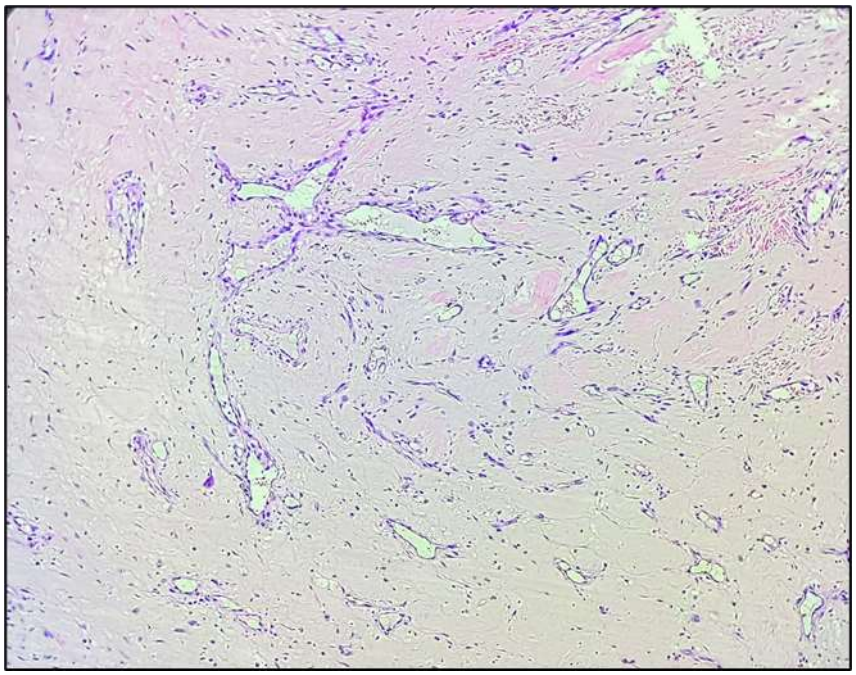

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FIGURE 4- Inverted papilloma: Downward endophytic growth of round to elongated interconnected epithelial nests is seen. Epithelium is hyperplastic. Stroma is edematous and few areas show transmigration of neutrophils and eosinophils. (10x and 40x magnification; hematoxylin and eosin stain)

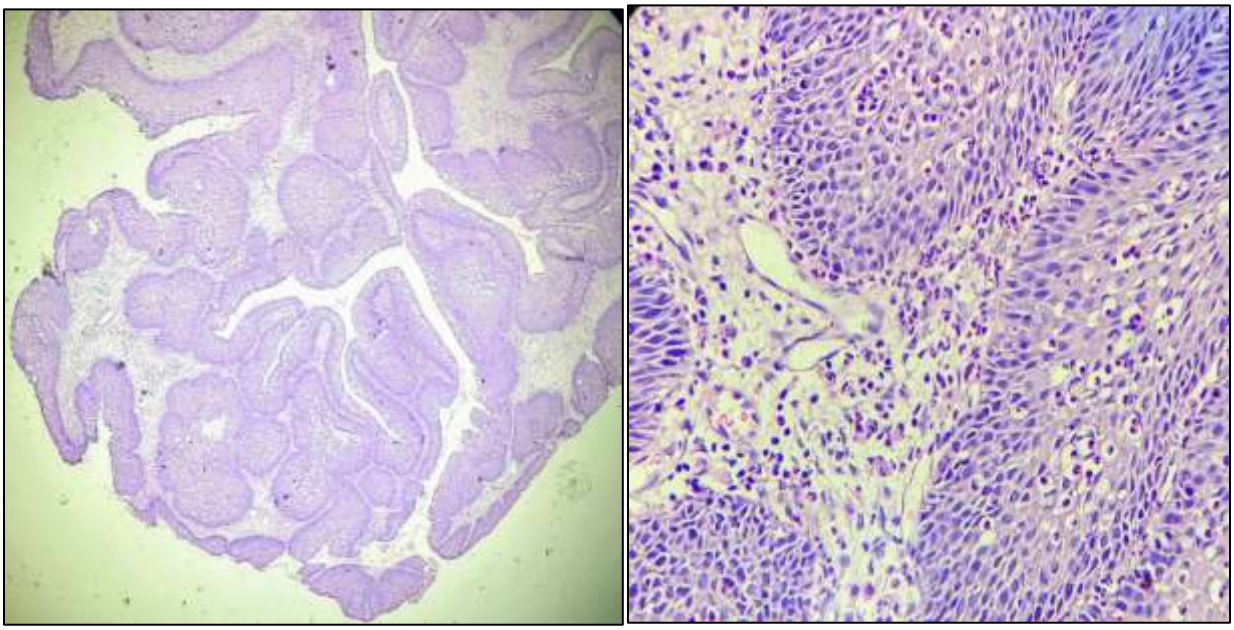

FIGURE 5- Schwannoma: A well-circumscribed lesion composed of spindle cells arranged in interlacing bundles and fascicles. with elongated, wavy nuclei are seen. The tumor features Antoni A areas with densely packed cells arranged in palisades (Verocay bodies) and Antoni B areas with a more myxoid stroma. (10x magnification; hematoxylin and eosin stain)

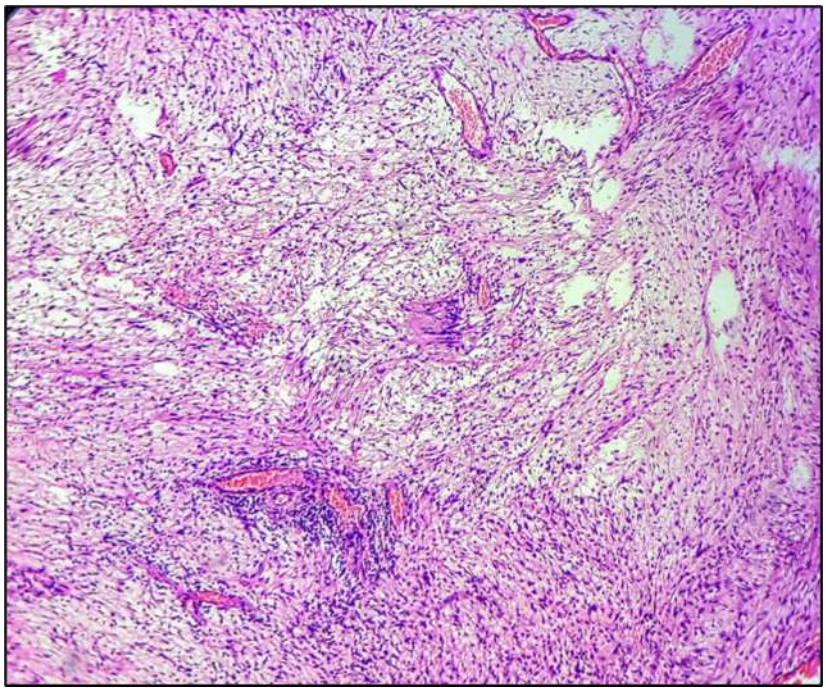

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FIGURE 6- Poorly differentiated malignancy: Cells are arranged in nests and sheets, separated by thin fibrous septa. The tumor cells are round to polygonal with moderate to abundant eosinophilic cytoplasm and hyperchromatic, pleomorphic nuclei and prominent nucleoli. Frequent mitotic figures are present. The stroma shows areas of desmoplasia with loose connective tissue. (10x magnification; hematoxylin and eosin stain)

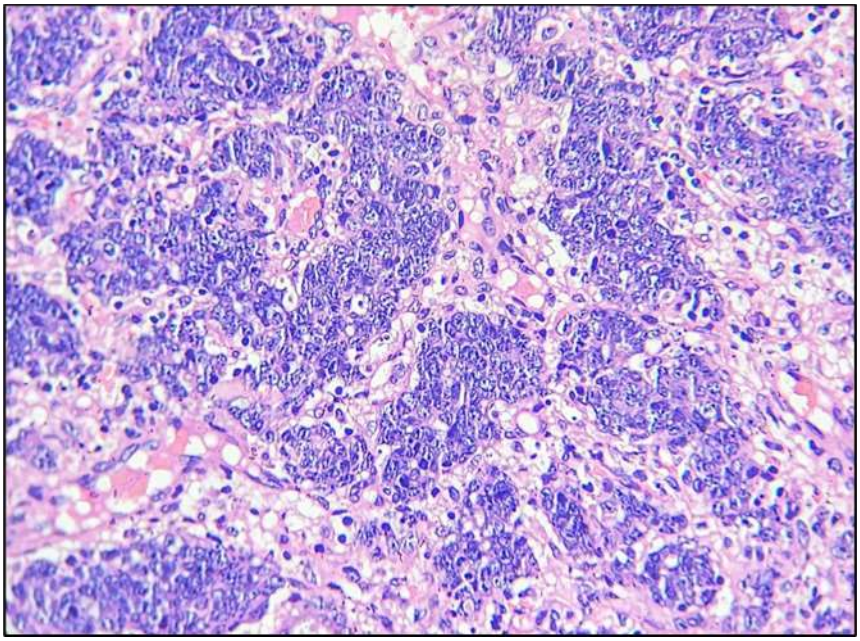
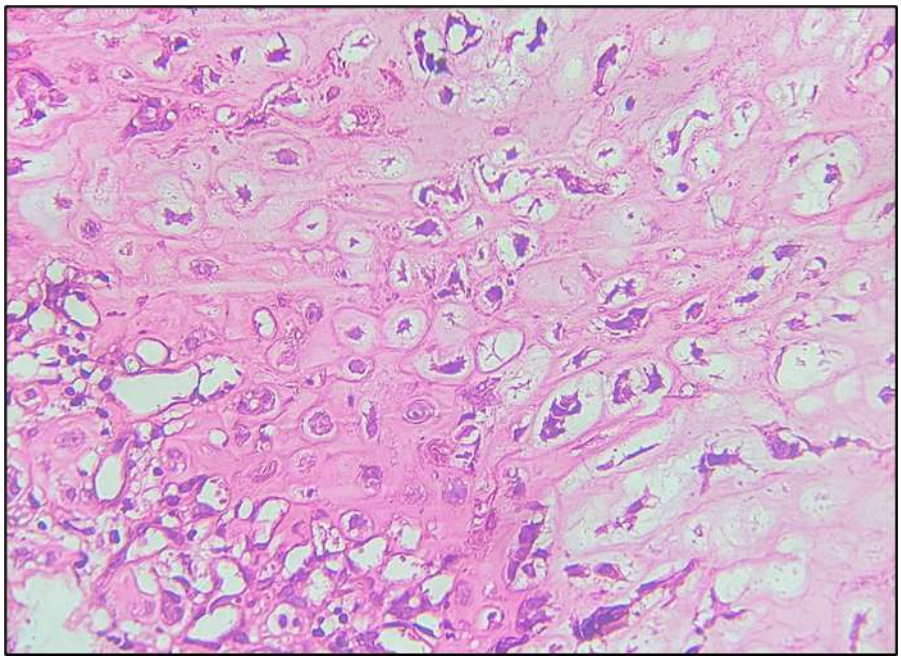


FIGURE 7- Chondrosarcoma: Neoplastic chondrocytes are embedded in an abundant chondroid matrix and arranged in a lobular pattern with hyperchromatic, irregular, and pleomorphic nuclei. Some cells show multinucleation. The background exhibits hyalinization, myxoid changes, and occasional calcifications. Mitoses are rare. (10x magnification; hematoxylin and eosin stain)



Discussion

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Polypoidal masses in the nasal cavity are frequently encountered lesions in clinical practice. These lesions can range from simple nasal polyps to polypoidal growths caused by various pathological conditions, spanning from infectious diseases to polypoidal neoplasms.

In our study, polypoidal lesions were more commonly observed in males, with a male-to-female ratio of 1.9:1. Similarly, studies by Lathi et al. [4] (male-to-female ratio of 1.6:1) and Zafar et al. (5) (male-to-female ratio of 2:1) also reported a male predominance. Conversely, Bakari et al. (6) from Nigeria documented a female predominance with a ratio of 1.2:1. Lesions in the nasal cavity are most likely to develop during the second to fourth decades of life. Malignancies have been reported generally after the fourth decade of life.

Chronic inflammation of the mucous membranes of the nose and sinuses leads to the formation of nasal polyps, which are the most common abnormalities in the nasal cavity. Although their exact cause is unclear, they are significantly associated with allergies, infections, asthma and sensitivity to aspirin. We found that 62% of nasal polypoidal lesions were non-neoplastic. Previous studies by Zafar et al [5], Bakari et al [6] and Dasgupta et al [7] reported such a high proportion of neoplastic lesions. Nasal polyps are classified as allergic nasal polyps characterized by a significant presence of eosinophils among other stromal inflammatory cells. In contrast, there are many lymphocytes, neutrophils, plasma cells and fewer eosinophils in inflammatory nasal polyps. Ethmoid and antrochoanal polyps usually correspond to allergic and inflammatory types. This pattern was also observed in the present study when two forms of polyps were analysed.

In our study, capillary haemangiomas were the most common benign neoplastic lesions observed in individuals aged between the third and fourth decades, with a male predominance. Dasgupta et al. [7] also reported haemangiomas as one of the most common benign lesions (59 cases or 45.7%), predominantly in male patients. Microscopically, all capillary haemangiomas revealed varying sizes of vascular spaces lined by plump endothelial cells.

In our study, there were 6 cases (12%) of inverted papillomas observed across an age range from 21 to 60 years. These cases predominantly affected males. Tondon et al. reported 8 cases of inverted papillomas out of 64 cases [8]. According to Thorp et al. [9], inverted papillomas most commonly occur between the fifth and seventh decades of life, with a male-to-female ratio of 2:1. Microscopically, it revealed acanthotic stratified squamous epithelium and tumor cells arranged in large nests that arise from the epithelial lining and extend downward into the stroma.

Angiofibroma affected 3 individuals in our current study. These cases ranged in age from 11 to 50 years and included both teenagers and adults, mostly men. Juvenile angiofibroma is a rare tumor which is locally invasive and histologically benign tumors occur in the nasopharynx and young males, accounting for 0.05% of head and neck tumor incidences [10]. Kapadia et al. [11] in a study on angiofibroma, it was observed only in males aged 10-17 years. According to Dasgupta et al. research revealed that 30 cases of angiofibroma (23.2%) in age group (10-55 years) and was observed mainly in males with mean age of 23 years [7]. Microscopic examination revealed more vascularity, numerous slit-like or gapped vessels, and sheets of fibroblasts.

Peripheral nerve tumors of the sinonasal region are extremely rare. They are thought to originate from the ophthalmic and maxillary branches of the trigeminal nerve and branches of the autonomic nervous system. Neurilemmoma (Schwannoma), the most frequent type of soft tissue tumor, is highly hypercellular and typically not encapsulated, leading to diagnostic difficulties [12]. We encountered one case of schwannoma. The histology examination revealed markedly hypercellular, compactly arranged, interlacing bundles of spindle cells arranged in palisading pattern (Antony A and B areas) and scanty interspersed fibroconnective tissue.

In our study, there was one case of poorly differentiated carcinoma in a 62-year-old male patient. From study done by Naggar et al. both males and females with poorly differentiated carcinoma were reported [13]. However, Dasgupta et al. [7] reported a single case in a woman. Microscopically, the polyp displayed characteristics like invasive malignancy, including nests of neoplastic cells with hyperchromatic, mitotically active nuclei, prominent nucleoli, and sparse vascularized cytoplasm. Immunohistochemistry showed that tumor cells were immunopositive for CK (cytokeratin), synaptophysin,

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chromogranin (weak), EMA (epithelial membrane antigen), CD56, Ki-67 proliferation index ranged from 40% to 50%.

Chondrosarcomas are notably rare when originating from the nasal septum [14]. Our study describes a unique case of primary chondrosarcoma in a 63-year-old male patient. This case is particularly significant given the uncommon nature of this location of the tumor. Our findings align with those reported by Maingi et al. (2019) [15] and Aziz et al. (2022) [16]. Maingi et al. documented a similar case of nasal septal chondrosarcoma, providing valuable insight into the clinical presentation and treatment of this rare condition. Similarly, Aziz et al. highlighted the rarity of this tumor in the nasal septum and discussed its management in their study of a large nasal septum chondrosarcoma. Treatment primarily involves surgical resection, with minimally invasive techniques reducing morbidity. For high-grade tumors or cases with incomplete resection, adjuvant therapies are often considered, reflecting current treatment practices.

Conclusion

Polypoidal lesions in the nasal cavity vary widely, ranging from benign inflammatory lesions to potentially fatal carcinomas. This study, conducted at a tertiary care institute, highlights the critical role of histopathological evaluation in accurately diagnosing these lesions. The study helped to understand the diverse range of these lesions form non-neoplastic to neoplastic including benign and malignant nasal tumors. Among the tumors, capillary haemangioma was the most common benign lesion. Benign conditions typically peak between the second and fourth decades of life, whereas malignancies generally manifest after the age of 40. Diagnosis by clinical and radiological examination alone is insufficient; therefore, all excised nasal polypoidal masses should undergo histopathological examination to avoid delays in appropriate treatment.

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