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A Clinicopathological Study about Lesions Occurring in Nasal and Paranasal Sinuses and Nasopharynx

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ABSTRACT

Background: The nasal cavity, nasopharyngeal, and paranasal areas are affected by several non -neoplastic and neoplastic disorders. Determining whether the lesion is neoplastic or non-neoplastic is challenging. Therefore, histopathological analysis is crucial for both the pathologists and surgeons. **Objective**: This research aimed to assess the pathological analysis of the diseases occurring in the nasal cavity, paranasal sinuses, and nasopharyngeal area according to their frequency, age, sex, and distribution by site ***Methods:*** *The current study with cross-sectional design was performed in the histopathological department of Shahid Ghazi Al-Harery Teaching Surgical Hospital in Baghdad Medical City over a three-year period from December 2021 to December 2024. Tissue samples were collected and fixed in 10% neutral-buffered formalin. The material was processed as routine. Five-micron-thick sections were cut and stained with hematoxylin and eosin.* ***Results****: Among 299 patients, 96 were females and 203 were males. The majority of the affected age group in this study was from the 2nd decade to the 4th decade. Among 299 cases; 169 were non-neoplastic lesion cases and 130 neoplastic lesion cases of which 60 were benign and 70 were malignant. Out of 169 cases of inflammatory and non-neoplastic lesions, inflammatory nasal polyp (81 cases) was the most common lesion. Out of 60 benign neoplastic cases, sinonasal papilloma (24 cases) was the most common benign neoplastic lesion. Out of 70 malignant cases, nasopharyngeal carcinoma was the commonest histopathological type, constituting 35 cases.* **Conclusion:** Since the majority of nasal cavity, paranasal sinus, and nasopharyngeal lesions can appear as polyp-like lesions; a histopathological analysis of these lesions can assist surgeons in diagnosing a condition and choosing the best course of therapy for the patient.

Keywords: Histopathological; Nasal cavity; Neoplastic; Non-neoplastic; Paranasal sinuses.

Article Information

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INTRODUCTION

The respiratory tract is subdivided into the upper respiratory tract, which includes the nasal cavity, paranasal sinuses, pharynx, and larynx) and the lower respiratory tract, These areas consist of several types of tissues including epithelial tissue, connective tissue, and muscle tissue. And nervous tissue, and are vulnerable to several diseases, including non-neoplastic and neoplastic (benign and malignant) conditions. [1]. Common presenting symptoms of nasopharyngeal, nasal, and paranasal sinus lesions are masses, nasal obstruction, and epistaxis. Many foreign materials, including allergens, viruses, physical and chemical irritants, and other environmental factors, can affect the upper airway tract [2]. The nasal, nasopharyngeal, and paranasal sinus regions experience various clinical disorders due to this multifactorial exposure. These ailments include benign and malignant neoplastic lesions and non-neoplastic lesions such as infection, inflammation, and polyps [2]. A presumptive diagnosis is made possible by the presenting characteristics, clinical features, and imaging studies, such as ultrasound, computed tomography, and magnetic resonance imaging. However, a complete histopathological study is necessary for a accurate diagnosis and prompt action ([3]. The purpose of this research was to assess the pathological analysis of disorders of the paranasal sinuses, nasopharyngeal area, and

nasal cavity according to their frequency, age, sex, and distribution by site and to contrast the outcomes with the accessible information.

METHODS

The current study with a cross-sectional design was performed in the histopathological department of Shahid Ghazi Al-Harery Teaching Surgical Hospital in Baghdad Medical City over a three-year period from December 2021 to December 2024. cases that were not amenable to medical treatment were the inclusion criteria in this study. Tissue samples were collected and fixed in 10% neutral-buffered formalin, and processed, and The usual hematoxylin and eosin staining was used.

RESULTS

The current study analyzed 299 cases of sinonasal, and nasopharyngeal lesions in total over three years from December 2021 to December 2024 comprising 169 non-neoplastic lesion cases and 130 neoplastic lesion cases (60 benign cases, and 70 malignant cases). The patient' ages ranged from 4 to 83 years with an average age of presentation being 36.5 years and the male-to-female ratio was 2:1 revealing male predominance. The commonest site involved was the nasal cavity followed by the nasopharynx and paranasal sinuses. Out of 169 cases of non-neoplastic lesions; inflammatory nasal polyp (81 cases) was the most common lesion, then the fungal infections (43 cases). Out of 60 benign neoplastic cases; sinonasal papilloma (24 cases) was the most common benign lesion, then angiofibroma (10 cases) and cavernous hemangioma (8 cases). Out of 70 malignant cases; nasopharyngeal carcinoma was the predominant histological type constituting 35 cases followed by squamous cell carcinoma (15 cases) and Basal cell carcinoma of nasal skin (6 cases).

Table 1: Frequency of distribution of neoplastic and non-neoplastic lesions of the nose, nasopharyngeal areas, and paranasal sinuses studied.

The Nature of lesion	Number of cases	percentage
1. Non-neoplastic	169	56.52
2. Neoplastic	130	43.47
Benign	60	20.06
Malignant	70	23.41
Total	299	100%

Table 2: Frequency of distribution of non-neoplastic lesions of the nasal cavity, nasopharynx, and paranasal sinuses.

Nature of lesion	Number of lesions	percentage
Inflammatory /allergic polyp	81	47.92%
Fungal infection	43	25.44%
Reactive Lymphoid Hyperplasia	29	17.15%
Antrochoanal polyp	6	3.55%
Nasolabial cyst	3	1.77%
Chronic granulomatous lesion	3	1.77%

Nature of lesion	Number of lesions	percentage
Wegner granulomatous	1	0.59%
Chronic osteomyelitis	1	0.59%
sialadenitis	1	0.59%
mucocele	1	0.59%
total	169	100%

Table 3: Frequency of distribution of non-neoplastic and neoplastic lesions of the paranasal sinuses, nasal cavity, and nasopharyngeal area according to age groups.

Age group	Non-neoplastic cases	Benign cases	Malignant cases
0-10 y	9	8	10
11-20y	34	10	9
21-30y	33	9	10
31-40y	38	6	10
41-50y	29	9	10
51-60y	14	8	12
61-70y	10	5	8
71-80y	1	5	1
81-90y	1	0	0
90-100y	0	0	1
Total cases	169	60	70

Table 4: Frequency of distribution of Neoplastic benign cases of the nasal cavity, paranasal sinus, and nasopharyngeal area

The nature of the lesion	Number of cases	percentage
Sinonasal papilloma	24	40%
Angiofibroma	10	16.66%
hemangioma	8	13.33%
Ameloblastoma	6	10%
Fibrous dysplasia	2	3.33%
Cemenifying fibroma	1	1.66%
schwannoma	2	3.33%
0steoma	1	1.66%
glomus tumor	1	1.66%
Solitary fibrous tumor	1	1.66%
lipoma	1	1.66%
Langerhans cell histiocytosis	1	1.66%
meningioma	1	1.66%
seborrheic keratosis	1	1.66%
Total	60	100%

Table 5: Frequency of distribution of Neoplastic malignant cases of the nose, paranasal sinus, and nasopharynx.

Nature of lesion	Number of cases	percentage
Nasopharyngeal carcinoma	22	31.42%
squamous cell carcinoma	15	21.42%
Basal cell carcinoma	6	8.57%
lymphoma	7	10%
Embryonal rhabdomyosarcoma	4	5.71%
Olfactory neuroblastoma	3	
Sinonasal papilloma with malignant transformation	3	4.28%
Malignant ameloblastoma	2	2.85%
osteosarcoma	1	1.42%
Adenoid cystic carcinoma	1	1.42%
Soft tissue sarcoma	1	1.42%
Sinonasal adenocarcinoma non intestinal type	1	1.42%
Metastatic Papillary thyroid carcinoma	1	1.42%
Nasal chondrosarcoma	1	1.42%
Ewing sarcoma	1	1.42%
Plasmacytoma	1	1.42%
Total	70	100%

DISCUSSION

Numerous tumors can be seen in the nasopharynx, nasal cavity, and paranasal sinuses. Clinically, it can be challenging to determine whether a lesion is neoplastic or non-neoplastic because these tumors are frequently misdiagnosed as chronic inflammatory diseases. Histopathological investigation results in a conclusive diagnosis, however imaging studies and present features aid in making a probable diagnosis. It is important to differentiate between non-neoplastic lesions and neoplastic lesions because of different treatment modalities and emotional burdens on the patient. The most common lesions observed in this study were:

Inflammatory nasal polyp is the most common type of sinonasal polyp, occurring in cases of chronic rhinosinusitis. Clinically, these polyps were commonly presented with nasal obstruction and mass. Microscopically, the polyps were composed of edematous stroma infiltrated by mixed inflammatory cells.

Sinonasal papilloma is a benign tumor of the sinonasal tract that has three types. Inverted papilloma, exophytic papilloma, and oncocytic papilloma: Association with human papillomavirus (HPV) has been implicated, especially with the inverted and exophytic subtypes. Clinically these lesions were commonly presented with nasal mass. Complete surgical excision is the treatment of choice.

Nasopharyngeal carcinoma was the most common malignant tumor observed in this study. The non-keratinizing, undifferentiated subtype is the most common, showing a syncytial growth pattern, vesicular nuclei with prominent central nucleoli, and reactive lymphoid stroma. Most are positive for Epstein-Barr virus/Epstein-Barr-encoded RNA in endemic areas. It commonly presents with painless upper cervical lymph node metastasis, and in the nasopharyngeal area, it is presented as a mass. Radiation therapy is the mainstay of treatment.

The lesions had a stronger predilection for males as compared to females with the male to female ratio being 2.1. This may be due to a combination of several factors, including genetic and environmental agents and hormonal influences. The findings of this research are similar to the study done by Surange et al where the majority of the patients were males [(4).] According to our research, men were more likely than women to have neoplastic lesions , may be due to men having greater occupational exposure to carcinogens like wood and leather dusts compared to women .which is similar to the study of Garg and Mathur [(5).]

According to the age groups, the most impacted age group was from the 2nd decade to the 4th decade which is similar to research done by Archana Bundela et al [(6).] The Percentage of non-neoplastic lesions was the greatest in 31-49 years while benign lesions were maximum (35%) in 11-20 years. The neoplastic malignant lesions were maximum in (51-60y). A number of factors, such as immunological system development and anatomical and developmental changes, and environmental agents may contribute to benign tumors occurring at younger ages. Also, some diseases, such as cystic fibrosis and asthma, are more prevalent in younger age groups , However, in the later decades (after the 4th decade), individuals are at a higher risk for developing malignant tumors due to the accumulation of genetic mutations and the increased risk of exposure to carcinogens over

time, smoking, and the natural aging process. Out of 299 nasal, paranasal, and nasopharyngeal cases; 169 (56.52%) were non-neoplastic lesions and 130 (43.47%) were neoplastic lesions in this study. Inflammatory nasal polyps were the most frequently found among non-neoplastic lesions which is similar to the study done by Sarumathy et al. in which the study included 73 cases of non-neoplastic lesions had inflammatory nasal polyps [7].

In neoplastic cases; 60 (20.06%) cases were benign and 70 (23.41%) cases were malignant which is similar to the study done by Shikha Ngairangbam et al [8]. The most common lesion among benign tumors was an inverted sinonasal papilloma with 24 cases (40%) then angiofibroma with 10 cases (16.66%) and hemangioma with 8 cases (13.33%). These findings contrast with those of a study done by Mohapatra et al. (2020); in which 21 cases with benign lesions; Hemangioma was the commonest benign lesion with 6 cases (28.57%) then inverted sinonasal papilloma with 4 cases (19.04%) [9]. Of neoplastic malignant cases Nasopharyngeal carcinoma was the most frequent type with 22 cases (31.24%) than squamous cell carcinoma with 15 cases (21.44%). This finding was similar to the study done by Begum MS, et. al which found nasopharyngeal carcinoma as the most frequent malignant lesion among 18.18% of the cases [10].

Study Limitations

1. This was a single-center study with a retrospective design. It included a relatively small sample size. These findings need to be analyzed in a study with a larger sample size.
2. The retrospective pattern of the study might introduce recall bias and limit the control over data completeness.

CONCLUSION

Numerous neoplastic and non-neoplastic lesions occur in the Sinonasal and nasopharyngeal regions. Among benign cases, Sinonasal inverted papilloma was the most common lesion. At the same time, nasopharyngeal carcinoma was the most common malignant lesion.

Ethical approval

This research was designed with the approval of the scientific committee of Al-Kindy College of Medicine, University of Baghdad, Iraq. (No: 7840 on 3/12/2024).

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NO Conflicts of Interest.

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