HISTOPATHOLOGICAL STUDY OF NASAL MASSES IN A TERTIARY CARE HOSPITAL

Gurpreet Kour Archana Gupta, K C Goswami, Arvind Khajuria
Corresponding Author :
Email: dr.archanagupta10@gmail.com

Abstract

Background: The nasal cavity is the most cephalic part of the respiratory tract which communicates with the external environment via the anterior apertures and with the nasopharynx via the posterior apertures. Sinonasal masses have inflicted man from time immemorial**.** A variety of inflammatory and neoplastic conditions involve the nasal cavity and paranasal sinuses

Aims and Objectives 1) To study histopathological pattern of nasal masses. 2) To classify the lesions into non-neoplastic or neoplastic category. 3) To determine relative distribution of various lesions with regard to age and sex.

Materials and Methods: The present study was conducted over a period of two years- 1) Retrospective analysis (November 1, 2019 to October 31, 2020). 2) Prospective analysis (November 1, 2020 to October31, 2021). For retrospective study, all information regarding cases of nasal masses was collected from the records available in the department of pathology. All the stained slides were reviewed along with clinical information. For prospective analysis, all the specimen of nasal masses were received carefully along with proper history, relevant investigations and type of biopsy. The information was recorded in a pre-structured proforma.

Results: Out of 50 patients, 37 (74%) patients had non- neoplastic disease and the remaining 13 (26%) patients had variety of neoplastic lesions of the nasal cavity. Among the patients having non-neoplastic lesions, inflammatory polyp was the most common diagnosis and was present in 29 (78%) patients. Among benign lesions, a total of three cases of hemangiomas were observed accounting for 43% of the benign tumors in the present study. In our study one (14.3%) case was diagnosed as angiofibroma. Two (28.6%) cases of inverted papillomas were observed. One (14.3%) case of cemento-ossifying fibroma was seen. Among malignant lesions one (16.6%) case each of squamous cell carcinoma, adenoid cystic carcinoma, olfactory neuroblastoma, embryonal rhabdomyosarcoma, chordoma and malignant melanoma was seen.

Conclusion: Histopathological examination is the only means of determining whether the lesion is neoplastic or non-neoplastic.

Keywords: Neoplasm, polyp, papilloma, angiofibroma, embryonal rhabdomyosarcoma.
DOINumber:10.14704/nq.2022.20.8.NQ44874 **NeuroQuantology 2022; 20(8): 8506-8513**

Introduction

Sinonasal masses have inflicted man from time immemorial.[1] A variety of inflammatory and neoplastic conditions involve the nasal cavity

and paranasal sinuses. Inflammatory lesions are more common than neoplastic masses.[2] Among the inflammatory masses, nasal polyps are the most common affecting up to four percent of the population. Their etiology remains unclear, but they are known to have associations with allergy, asthma, infection and aspirin sensitivity.[3] The average age of onset of nasal polyposis is third and fourth decade and is more frequent in men with a male to female ratio of 2:1.[4] They present with nasal obstruction, anosmia, rhinorrhoea and post nasal drip. The other causes for inflammatory nasal masses are bacterial (rhinoscleroma, tuberculosis), fungal (rhinosporidiosis, candidiasis, aspergilosis, mucormycosis, histoplasmosis).[5] Nasal epithelium can be involved by a varied range of epithelial and non- epithelial tumours. Epithelial tumours are three times more common than non-epithelial tumours.[2] Among the benign neoplasms, inverted papilloma is the most common.[2] It is a benign, but locally aggressive tumor that usually presents as the unilateral fleshy mass and has 10% incidence of malignant transformation to transitional cell carcinoma.[6,7,8] Other benign tumors found in nasal cavity are angiofibroma, hemangioma, desmoid tumor and pleomorphic adenoma. Among the malignant neoplasms, most frequently encountered is the squamous cell carcinoma. Other malignant neoplasms which may be found in nasal cavity are adenocarcinoma and melanoma.[9]

Tumours of nasal cavity are difficult to diagnose.[10] Masses suspected as inflammatory in origin can turn out to be malignant on detailed histopathological examination and vice- versa.[11] Thus, a complete histopathological examination is necessary to decide the nature of nasal masses.

Aims and Objectives

1. To study histopathological pattern of nasal masses.
2. To classify the lesions into non-neoplastic or neoplastic category.
3. To determine relative distribution of various lesions with regard to age and sex.

Materials and Methods

The present study was conducted over a period of two years in the Post-Graduate Department of Pathology, Acharya Shri Chander College of Medical Sciences & Hospital, Sidhra after obtaining due clearance from Institutional Ethical Committee.

1. Retrospective analysis (November 1, 2019 to October 31, 2020).
2. Prospective analysis (November 1, 2020 to October31, 2021).

INCLUSION CRITERIA:

1. Cases with nasal masses who presented in the ENT department of ASCOMS and Hospital, Jammu.
2. Primary lesions of nasal cavity which were confirmed with diagnostic nasal endoscopy.
3. All age groups were included.

EXCLUSION CRITERIA:

1. Lesions of nasal skin.
2. Lesion of vestibule of nose.
3. Secondary invasion (metastasis) of the sinuses and nasal cavity.
4. Recurrence cases after radiotherapy and chemotherapy.

For retrospective study, all information regarding cases of nasal masses was collected from the records available in the department of pathology. All the stained slides were reviewed along with clinical information. For prospective analysis, all the specimen of nasal masses were received carefully along with proper history, relevant investigations and type of biopsy. The information was recorded in a pre-structured proforma.

METHODS OF THE STUDY:

A. Each case was analysed with respect to the following features:
   Age, Sex, Clinical presentation, Gross features, Histological types
B. The data was collected from both the clinical case sheets and histopathology records of Pathology department.

C. For the study into the patterns of different nasal masses, the paraffin sections of all biopsy proven cases were re-examined.

D. In the prospective study, 21 patients presenting with nasal masses with clinical features of rhinorrhoea, nasal obstruction and epistaxis were examined. The biopsies/ specimens received in the histopathological section were grossed meticulously and the details were noted. The tissue from the representative area of the specimen/tumour was prepared, fixed in 10% formalin, dehydrated with ascending grades of alcohol, cleared in xylene and finally embedded in paraffin. 3-5 micrometre thick paraffin sections were cut on rotary microtome, dewaxed and stained routinely with H&E.

Observations and Results

The present work pertains to the study of histopathologically proven cases of nasal masses in the Post-Graduate Department of Pathology (ASCOMS and Hospital), Jammu over a period of two years (November 2019 to October 2021). A total of 50 cases were studied.

Table 1 representing distribution of patients according to age.

AGE (in years)	NUMBER OF PATIENTS (n=50)	PERCENTAGE
1-10	1	2%
11-20	04	08%
21-30	10	20%
31-40	21	42%
41-50	05	10%
51-60	04	08%
61-70	03	06%
71-80	02	04%

The age and gender characteristics of the study population are represented in Tables 1-2. The highest number of cases (42%) were seen in the fourth decade of life and an overwhelming majority of these comprised of the inflammatory lesions.

Table 2 representing gender wise distribution of the patients.

GENDER	NUMBER OF PATIENTS	PERCENTAGE
MALE	24	48%
FEMALE	26	52%

Out of the 50 patients studied, 24 were males and 26 were females with a male to female ratio of approximately 1:1.

Table 3 representing the clinical features of the patients with nasal masses.

CLINICAL FEATURES	NUMBER OF PATIENTS	PERCENTAGE
RHINORRHEA	25	50%
NASAL OBSTRUCTION	17	34%
EPISTAXIS	08	16%
PAIN	04	06%
SWELLING	01	02%
NASAL CONGESTION	01	02%
DISCHARGE	01	02%

The commonest symptom with which the patients presented was rhinorrhoea occurring in 25 (50%) patients. Nasal obstruction was present in 17 (34%) patients while intermittent epistaxis was present in 8 (16%) cases.

Table 4 representing distribution of nasal masses based on histopathological diagnosis.

NASAL MASSES	NO. OF CASES	PERCENTAGE
Non-neoplastic	37	74%
Neoplastic	13	26%

Out of 50 cases 37 cases (74%) were non-neoplastic, rest were neoplastic.

Table 5 representing diagnosis of non-neoplastic nasal masses.

INFLAMMATORY POLYP	29	78%
RHINOSPORIDIOSIS	03	8.1%
MUCORMYCOSIS	03	8.1%
RHINOSCLEROMA	02	5.4%
TOTAL PATIENTS	37	100%

The most common non-neoplastic masses observed were inflammatory polyps accounting for 29 (78%) cases.

Grossly, inflammatory polyps were soft, polypoid masses, glistening white to brown in colour. Microscopy revealed loose edematous stroma with inflammatory infiltrate comprising of lymphocytes, plasma cells, neutrophils and few eosinophils. Rhinosporidiosis was characterized by polypoidal mass in nasal cavity. Microscopic examination revealed many thick- walled sporangia containing numerous spores Intervening stroma was infiltrated by lymphocytes, plasma cells and histiocytes.

Mucormycosis was present in diabetic patients and the patients suffering from Covid- 19 infection. Histologically, large areas of haemorrhage and necrosis were present along with marked chronic inflammatory cell infiltrate. Irregular branching, twisted and aseptate hyphae with PAS positivity were present.

Rhinoscleroma - Microscopic examination of these cases showed extensive infiltration of foamy macrophages (Mikulicz cells) and plasma cells in stroma.

Out of 50 patients, 13 had neoplastic lesions. Out of 13 patients having neoplastic nasal masses, six (46%) patients had malignant masses while remaining seven (54%) patients had benign nasal masses. Hemangiomas formed the largest group amongst the benign tumors comprising of three (43%) cases. The other benign tumors were papilloma (28.5%), angiofibroma (14.3%) and cemento-ossifying fibroma (14.3%). Other malignant tumours were- squamous cell carcinoma, embryonal rhabdomyosarcoma, malignant melanoma, chordoma, olfactory neuroblastoma and adenoid cystic carcinoma of the nasal cavity; present in one (16.6%) case each.

Table 6 showing diagnosis of benign lesions.

BENIGN LESIONS	NO. OF PATIENT	PERCENTAGE
HEMANGIOMA	03	43%
PAPILLOMA	02	28.5%
ANGIOFIBROMA	01	14.3%
CEMENTO-OSSIFYING FIBROMA	01	14.3%
Total no. Of patients	07	100%

Most common benign lesions seen was hemangioma in 3 cases (43%) followed by papilloma in 2 cases (28.5%).

Grossly, hemangiomas were polypoidal masses, soft in consistency and haemorrhagic on cut section. Histologically, hemangiomas showed neoformed capillaries containing blood and arranged in lobules and nests.

Angiofibroma was observed in one case. Histologically, angiofibromas show mixture of proliferating blood vessels and a fibrous stroma.

Microscopically, inverted papillomas were characterised by downward proliferation of the epithelium into the stroma with orderly maturation.

Cemento- ossifying fibroma was present in one case. Macroscopic examination consisted of multiple grey brown fragments. Cartilaginous and bony tissue fragments were seen. Cut section showed focal cystic areas filled with thick mucoid material. Microscopic examination showed fibrous stroma with bone trabeculae and associated variable mineralized material that resembled dental cementum.

Table 7 showing diagnosis of malignant lesions of nasal cavity.

MALIGNANT LESIONS	NO. OF PATIENT	PERCENTAGE
SQUAMOUS CELL CARCINOMA	01	16.6%
OLFACTORY NEUROBLASTOMA	01	16.6%
EMBRYONAL RHABDOMYOSARCOMA	01	16.6%
ADENOID CYSTIC CARCINOMA	01	16.6%
CHORDOMA	01	16.6%
MALIGNANT MELANOMA	01	16.6%
Total no. Of patient	06	100%

Out of 6 malignant neoplastic lesions seen in our study, 1 case (16.6%) each of Squamous Cell Carcinoma, Olfactory Neuroblastoma, Embryonal Rhabdomyosarcoma, Adenoid Cystic Carcinoma, Chordoma and Malignant Melanoma were seen.

Squamous cell carcinoma was categorised as well- differentiated. Adenoid cystic carcinoma- Histologically, the tumour showed nests and columns of cells arranged concentrically around gland like spaces forming a cribriform pattern. Grossly, olfactory neuroblastoma was polypoidal, glistening and vascular in appearance. Histologically, the tumor showed circumscribed lobule separated by vascularized stroma.

Embryonal rhabdomyosarcoma was present in a two year old boy. Grossly, it was fleshy forming grape like mass. On histological examination, tumour showed round to spindled primitive mesenchymal cells with hyperchromatic nuclei seen.

Chordoma was observed in one case. Histologically, large physaliphorous cells with vesicular nuclei embedded in a homogenous, intercellular substance were present.

Malignant melanoma was seen in one case. Grossly, it was friable mass. Histologically, nests of large cell with high nuclear: cytoplasmic ratio, vesicular nuclei, prominent nucleoli and intracytoplasmic inclusions seen.

Discussion

During the study period, 50 patients with nasal masses were analysed.

In our study, nasal masses had an almost equal predilection for males and females, demonstrating a male to female ratio of approximately 1:1 (24 males and 26 females). In the study conducted by Shuiabu IY et al[12] male preponderance was seen (male-to female ratio of 1.7:1). The study conucted by Zafar U *et al*[13] and Bakari A *et al*[14] revealed female preponderance (M:F ratio of 1:1.2).

The age of the patients in the present study ranged from 2 to 76 years with maximum patients presenting in the 4th decade of life

(42%). Bakari A *et al*[14] had reported a peak incidence at 33 years, while for Zafar U *et al*[13] the mean age of presentation was 22.5 years. Most of the patients presenting in 3rd and 4th decade of life had non- neoplastic lesions. Malignancies were mostly reported after 4th decade of life. One exception was embryonal rhabdomyosarcoma of nasal cavity which was diagnosed in a male child of two years.

The common presentations of nasal masses were rhinorrhoea (50%), nasal obstruction (34%), epistaxis (16%), pain (6%), swelling causing external deformity of nose and cheek (2%), nasal congestion (2%) and nasal discharge (2%). These findings compare favourably with Lathi A *et al.*[15]

Among the patients having non- neoplastic lesions, inflammatory polyp was the most common diagnosis and was present in 29 (78%) patients. Such a high proportion of non-neoplastic lesions has been reported in previous studies.[13,14,16] Rhinosporodiosis, an endemic disease in India and few African nations[17] was diagnosed in three (8.1%) patients. Pradhananga R *et al*[18] had encountered only one case during their two-year study period. The incidence of Rhinoscleroma was 5.4% among non-neoplastic lesions. Much higher incidence was reported by Zafar U *et al*[13] while no case was reported by Bakari A et al[14] and Pradhananga R *et al.*[18]

In the present study three (8.1%) cases of cases of mucormycosis were reported and all were seen in Covid 19 infected patients. Histology showed irregular branching, twisted and aseptate hyphae. This is in agreement with the observations made by Juvekar MR *et al.*[19]

Out of 50 patients, 37 (74%) patients had non-neoplastic disease and the remaining 13 (26%) patients had variety of neoplastic lesions of the nasal cavity. Out of 13 neoplastic lesions, seven (14%) were benign and six (12%) were malignant lesions. In a study by Lathi A *et al*[15] , non-neoplastic lesions were seen in 80 (71.4%) subjects and neoplastic lesions in 32 (28.6%) cases.

Among benign lesions, a total of three cases of hemangiomas were observed accounting for 43 % of the benign tumors in the present study. This finding corresponds to the observation of Pradhananga R *et al.*[18] In our study one (14.3%) case was diagnosed as angiofibroma. In contrast, Shashin K *et al*[20] and Sreenivas G and Kiranmayi VS[21] reported a higher incidence of angiofibroma with 58% and 36.6% of the cases respectively.

Two (28.6%) cases of inverted papillomas were observed. Shashin K *et al*[20] in their series observed 18% cases of inverted papilloma.

Inverted papillomas are comparatively rare, but this morphological variant is the most commonly encountered lesion of all sinonasal papillomas.[22,23] Cemento- ossifying fibroma was present in one (14.3%) case.

Among malignant lesions one (16.6%) case with squamous cell carcinoma of nasal cavity was identified. Svane-Knudsen et al[24] and Zacharia AA et al[25] have reported squamous cell carcinoma to be the most commonly encountered malignancy of sinonasal tract in Denmark. One case each of adenoid cystic carcinoma, embryonal rhabdomyosarsoma, olfactory neuroblastoma, malignant melanoma and chordoma (16.6%).

Histopathological examination is conclusive in detecting the nature of nasal lesions. It is the only means of determining whether the lesion is non-neoplastic or neoplastic.

Conclusion

- Nasal masses had an almost equal predilection for males and females. The age of the patients in the present study ranged from 2 to 76 years. The common presentations of nasal masses were rhinorrhoea (50%), nasal obstruction (34%), epistaxis (16%), pain (6%) and swelling.
- Out of 50 patients, 37 (74%) patients had non- neoplastic disease and the remaining 13 (26%) patients had variety of neoplastic lesions of the nasal cavity.
- Among the patients having non- neoplastic lesions, inflammatory polyp was the most

*e*ISSN1303-5150 www.neuroquantology.com

common diagnosis and was present in 29 (78%) patients.

- Among benign lesions, a total of three cases of hemangiomas were observed accounting for 43% of the benign tumors in the present study. In our study one (14.3%) case was diagnosed as angiofibroma. Two (28.6%) cases of inverted papillomas were observed. One (14.3%) case of cemento-ossifying fibroma was seen.
- Among malignant lesions one (16.6%) case of squamous cell carcinoma, adenoid cystic carcinoma, olfactory neuroblastoma, embryonal rhabdomyosarcoma, chordoma and malignant melanoma was seen.

Financial Support and Sponsorship
Nil

Conflicts of Interest
There are no conflicts of interest.

Bibliography

1. Khan N, Zafar U, Afroz N, Ahmad SS, Hasan SA**.** Masses of nasal cavity, paranasal sinuses and nasopharynx: A clinicopathological study. *Indian J Otolaryngol Head Neck Surg* 2006;58(3):259-63.
2. Panchal L, Vaideeswar P, Kathpal D, Madiwale CV, Prabhat, DP. Sino-nasal epithelial tumours: a pathological study of 69 cases. *Journal of postgraduate medicine* 2005;51(1):30.
3. Garavello W, Gaini RM. Incidence of inverted papilloma in recurrent nasal polyposis. *Laryngoscope* 2006;116(2):221-3.
4. Johansson L, Åkerlund A, Melén I, Holmberg K Bende M. Prevalence of nasal polyps in adults: The Skovde population-based study. *Annals of Otology, Rhinology & Laryngology* 2003;112(7):625-29.
5. Taxy JB**.** Paranasal fungal sinusitis: contributions of histopathology to diagnosis: a report of 60 cases and literature review. *The American journal of surgical pathology* 2006;30(6):713-20.
6. Bohman A, Juodakis J, Oscarsson M, Bacelis J, Bende M Torinsson-Naluai Å. A family-based genome-wide association study of chronic rhinosinusitis with nasal polyps implicates several genes in the disease pathogenesis. *PLoS One* 2017;12(12):e0185244.
7. Roger A, Campillo EA, Torres MC, Millan C, Jáuregui I, Mohedano E *et al.* Reduced work/academic performance and quality of life in patients with allergic rhinitis and impact of allergen immunotherapy. *Allergy, Asthma & Clinical Immunology* 2016;12(1):1-9.
8. Leoncini, G, Zanetti L. The Papillomas of the Sinonasal Tract. A Comprehensive Review. *Pathologica* 2017;109(1);31-34.
9. Gil Z, Orr-Urtreger A, Voskoboinik N, Trejo-Leider L, Spektor S, Shomrat R *et al.* Cytogenetic analysis of sinonasal carcinomas. *Otolaryngology—Head and Neck Surgery* 2006;134(4):654-60.
10. Resto VA and Deschler DG. Sinonasal malignancies. *Otolaryngologic Clinics of North America*, 2004;37(2):473-87.
11. Khan SY. Clinico-pathological study of sino-nasal masses. *Indian J Otolaryngol Head Neck Surg* 2005;(special issue): 6064.
12. Shuaibu IY, Usman MA Ajiya A. Unilateral sinonasal masses: Review of clinical presentation and outcome in Ahmadu Bello university teaching hospital, Zaria, Nigeria. *Nigerian medical Journal: Journal of the Nigeria Medical Association* 2020;61(1):16.
13. Zafar U, Khan N, Afroz N, Hasan SA. Clinicopathological study of non-neoplastic lesions of nasal cavity and paranasal sinuses. *Indian Journal Pathology and Microbiology* 2008;51(1):26-29.

14. Bakari A, Afolabi OA, Adoga AA, Kodiya AM, Ahmad BM. Clinic-pathological profile of sinonasal masses. *BMC Research Notes* 2010;3:186.
15. Lathi A, Syed MM, Kalakoti P, Qutub D, Kishve SP. Clinico-Pathological Profile of Sinonasal Masses: A Study from a Tertiary Care Hospital of India. *Acta Otorhinolaryngologica Italica* 2011;31(6):372.
16. Gupta R, Moupachi SS, Poorey VK. Sinonasal Masses: A Retrospective Analysis. *Indian Journal of Otolaryngology and Head & Neck Surgery* 2012;65(1):52–56.
17. Morelli L, Polce M, Piscioli F, Del Nonno F, Covello R, Brenna A *et al.* Human Nasal Rhinosporidiosis: An Italian Case Report. *Diagnostic pathology* 2006;1:25.
18. Pradhananga R, Adhikari P, Thapa N, Shrestha A, Pradhan B. Overview of nasal masses. *Journal of Institute of Medicine Nepal* 2008;30(3):13-16.
19. Juvekar MR, Juvekar RV, Tendolkar UM. Fronto-ethmoidal mucormycosis—a case report." *Indian Journal of Otolaryngology and Head and Neck Surgery* 200052(2):269-71.
20. Shashin K, Somani S, Kamble P. Mischievous presentation of nasal masses in rural areas. *Indian J Otolaryngol Head Neck Surg* 2005;60-64.
21. Sreenivas G, Kiranmayi VS**.** Histopathology of nasal polyps-a retrospective study. *Indian Journal of Otolaryngology and Head and Neck Surgery* 2005;65.
22. Syrjanen KJ. HPV Infections in Benign and Malignant Sinonasal Lesions. *Journal of clinical pathology* 2003;56(3):174-81.
23. Humayun AHP, Huq AZ, Ahmed ST, Kamal MS, U KK, Bhattacharjee N *et al.* Clinicopathological Study of Sinonasal Masses. *Bangladesh Journal of Otorhinolaryngology* 2010;16(1):15-22.
24. Svane-Knudsen V, Jorgensen KE, Hansen O, Lindgren A, Marker P**.** Cancer of the nasal cavity and paranasal sinuses: a series of 115 patients. *Rhinology* 1998;36:12-14.
25. Zachariah AA, Koteeswaran G, Karthikeyan P. Histopathological spectrum of polypoidal lesions of nasal cavity in a tertiary care center. *International Journal of Medical & Health Research* 2019;5:56-59.