

Clinicopathological Spectrum of Nasopharyngeal Masses. A Hospital Based Study in a Tertiary Care Centre of Northeast India

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Abstract:- Nasopharyngeal mass is not an uncommon entity. Many types of masses including some rare ones have been mentioned in literatures. Because of the diversity of the cell types in the nasopharynx varied lesions may occur which might prove to be diagnostically challenging. **Aim and Objectives:** To evaluate the clinicopathological spectrum of nasopharyngeal masses.

MATERIALS AND METHOD: A prospective study was carried out in the Department of Pathology, Assam Medical College from September 2009 to August 2010. All nasopharyngeal masses were studied histopathologically with routine H&E stain and Immunohistochemistry was done as and when required. The bio-data, clinical profiles and histopathological diagnoses were analyzed.

RESULTS: The study comprised of 50 cases of nasopharyngeal masses. Age of the patients ranged from 8.5 years to 63 years with 36 males and 14 females. of the total 50 cases, 25 cases (50 %) are non neoplastic and the rest 25 cases (50 %) are neoplastic. Among the neoplastic cases malignant masses are more common in the nasopharynx than the benign masses comprising 16 cases (64 %) and 9 cases (36 %) of the neoplastic lesions respectively. Nasopharyngeal carcinoma is the commonest neoplastic lesion as well as the commonest malignant lesion. Among the benign lesion nasopharyngeal angiofibroma was the most common. Adenoids constituted the commonest non neoplastic masses. Nasal obstruction was the most common presenting symptom.

CONCLUSION: Nasopharynx can be a site for a variety of lesions and can occur in all age groups. Among the neoplastic masses majority are malignant in nature. Histopathology along with clinical correlation plays an important role in the diagnosis and management of such masses.

Keywords:- Nasopharynx; Northeast India; Clinicopathological.

I. INTRODUCTION

Though it constitutes only a small area, the strategic location along with the varied pathological lesions both benign and malignant that occur here and the difficulties in localizing them makes the study of nasopharyngeal masses an interesting

and challenging topic. Nasopharyngeal mass is not an uncommon entity. Many types of masses including some rare ones have been mentioned in literatures. Because of the diversity of the cell types in the nasopharynx varied lesions ranging from the common benign ones like antrochoanal polyps and adenoids to malignant lesions like nasopharyngeal carcinomas may occur. Most common benign tumor is the nasopharyngeal angiofibroma. Other tumors like papillomas, chondromas salivary tumors, teratomas and adenomas are rare.⁴ Nasopharyngeal carcinoma(NPC) is the most common malignant tumor.

Incidence of Nasopharyngeal carcinoma is rare in most parts of the world including India. Even though the incidence of oral cancer is very high in India, Nasopharyngeal carcinoma has a low incidence rate comparable to rest of the world except in certain ethnic groups of the North East India especially Nagaland, where it has a relatively high incidence. Hereditary factors and genetic predisposition along with local habits and viral infections play a very important role in this regard.

Nasopharyngeal masses can present with a myriad of signs and symptoms. Cervical lymphadenopathy, epistaxis and nasorespiratory symptoms, audiological symptoms (tinnitus, otalgia, deafness), neurological symptoms (headache, cranial nerve palsies) and metastases which may be local or distant .

Though nasopharyngeal masses are routinely encountered in clinical practice, there are only a few published studies especially from India. Therefore with a view to know about the incidence, age & sex distribution, symptoms and histological patterns and variations of the nasopharyngeal masses, this study was done within a limited time span of one year.

II. AIM AND OBJECTIVES

To evaluate the clinicopathological spectrum of nasopharyngeal masses. In the present study, an attempt is also made to establish a comparative study of incidence between benign & malignant masses and the age wise distribution of cases.

III. MATERIALS AND METHOD

A prospective study was carried out in the Department of Pathology, Assam Medical College, a tertiary care centre of North east India for a period of one year. A total of 50 cases were studied. Only those cases that had undergone biopsy

were included. Cases with lesions in the paranasal sinuses, orbits, nasal/oral cavities or larynx, with or without secondary extension to the nasopharynx, known cases of systemic lymphoma or known cases of lymphoma of other regions were excluded.

Sample was collected by using pretested and predesigned proforma. All nasopharyngeal masses were analyzed with routine H&E stain and Immuno- histochemistry was done as and when required. The bio-data, clinical profiles and histopathological diagnoses were compared.

IV. RESULTS

The study comprised of 50 cases of nasopharyngeal mass. The different diseases producing mass in the nasopharyngeal region in the present study are shown in Table 1. along with their incidence. It is observed that the hyperplastic adenoids are the most common mass lesion in the nasopharynx constituting 32 % of the total cases followed by nasopharyngeal carcinoma which constituted 30 % of the cases. Next in the order of frequency are antrochoanal polyp (18 %), nasopharyngeal angiofibroma (14 %), inverted papilloma (4%) and olfactory neuroblastoma(2%).

Lesions producing nasopharyngeal mass	Number of cases (50)	(%)
Adenoids	16	32
Nasopharyngeal carcinoma	15	30
Antrochoanal polyp	09	18
Nasopharyngeal angiofibroma	07	14
Inverted papilloma	02	04
Olfactory neuroblastoma	01	02

Table 1. Showing the Frequency of Different Mass Lesions

Non neoplastic	Cases	Neoplastic	Cases
Adenoids	16	Nasopharyngeal carcinoma	15
Antrochoanal polyp	09	Nasopharyngeal angiofibroma	07
		Inverted papilloma	02
		Olfactory neuroblastoma	01
Total	25	Total	25

Table 2. Table Showing the Neoplastic and Non Neoplastic Lesions

Table 2. shows of the total 50 cases, 25 cases (50 %) are non neoplastic and the rest 25 cases (50 %) are neoplastic.

Adenoids and antrochoanal polyps constituted the non-neoplastic lesions whereas nasopharyngeal carcinoma, angiofibroma, inverted papilloma and olfactory neuroblastoma constituted the neoplastic masses.

Neoplastic lesion of nasopharynx			
Benign		Malignant	
Nasopharyngeal angiofibroma	07	Nasopharyngeal Carcinoma	15
Inverted papilloma	02	Olfactory neuroblastoma	01
TOTAL CASES	09 (36%)		16 (64%)

Table 3. Showing the Distribution of Neoplastic Masses

From the above table, we see that among the neoplastic lesions malignant masses are more common in the nasopharynx than the benign masses comprising 64 % and 36 % of the neoplastic lesions respectively. Nasopharyngeal carcinoma is the commonest neoplastic lesion as well as the commonest malignant lesion. Among the benign lesion nasopharyngeal angiofibroma was the most common.

Neoplastic lesion of the nasopharynx		Age (yrs)		Sex	
Benign	Malignant	1-20	>21	Male	Female
Adenoids		16	-	09	07
Nasopharyngeal Angiofibroma		07	-	07	-
Antrochoanal polyp		07	02	05	04
Inverted papilloma		01	01	02	-
	Nasopharyngeal Carcinoma	01	14	13	02
	Olfactory neuroblastoma	-	01	-	01
TOTAL		32	18	36	14

Table 4. Showing the Mass Lesions with the Age and Sex Distribution

AGE GROUP (IN YEARS)	TOTAL	
	NO.	(%)
0—10	13	26
11-20	19	38
21-30	01	02
31-40	07	14
41-50	04	08
51-60	05	10
>60	01	02

Table 5. Showing the Overall Age Incidence of All Cases

SEX	NUMBER OF CASES	PERCENTAGE (%)
MALE	36	72
FEMALE	14	28

Table 6. Showing the Overall Sex Incidence of Cases in Males and Females

From the tables 4, 5 & 6, we see that mass lesions of the nasopharynx are more common in males than females. Males outnumber the females by 2.5 : 1. Age group < 20 years constitutes the greatest number of cases. 19 cases have been seen in the age group of 11-20 years whereas only 1 case is > 60 years of age. The youngest case is of a boy 8 ½ years of old.

SEX	BENIGN		MALIGNANT	
	NO.	(%)	NO.	(%)
MALE	23	67	13	81
FEMALE	11	32	03	19

Table 7. Showing the Sex Incidence in Benign and Malignant Cases

From table 7, we see that both the benign and malignant lesions are more common in males than the females. The male: female ratio for malignant lesions (4.2:1) is much higher than the benign lesions (2.09: 1).

Type			Total Number of cases
Keratinizing	Non keratinizing	Undifferentiated	
4(27%)	2(13%)	9(60 %)	15(100 %)

Table 8. Histologic Types of Npc

The above table shows that in the present study undifferentiated carcinoma is the most common histologic type of nasopharyngeal carcinoma comprising 60 % of the NPCs followed by keratinizing type 27 % and non keratinizing type 13 %.

Diseases producing sinonasal mass	Male	Female	Total
Adenoids	09	07	16
Antrochoanal polyp	05	04	09
Inverted Papilloma	02	-	02
Nasopharyngeal Angiofibroma	07	-	07
Nasopharyngeal Carcinoma	13	02	15
Olfactory Neuroblastoma	-	01	01
Total	36	14	50
Percentage (%)	72	28	100

Table 9. Disease Incidence According to Sex

Diseases producing sinonasal mass	0yr-9yr	10yr-19yr	20yr-29yr	30yr-39yr	40-49	50-60	>60	Total
Adenoids	12	04	-	-	-	-	-	16
Antrochoanal polyp	01	05	02	01	-	-	-	09
Inverted papilloma	01	-	-	-	-	01	-	02
Angiofibroma	-	07	-	-	-	-	-	07
NPC	01	-	-	04	04	05	01	15
Olfactory neuroblastoma	-	-	-	01	-	-	-	01
Total	15	16	02	06	04	04	03	50

Table 10. Shows the Disease Incidence According to Age

The above tables show that the majority of cases (16) are seen in the age group of 10-19 years followed by 15cases in the 0-9 years age group. Least number of cases was see in the age group of >60 years with only one case of nasopharyngeal

carcinoma. Adenoids are the most common lesion in the 0-9 years age group and JNA was the most common lesion in the 10 -19 years age group. Nasopharyngeal carcinoma was the

most common lesion found in the patients above 30 years of age.

Presenting symptom	no of patients	%
nasal obstruction	47	94%
nasal discharge	37	74%
Epistaxis	20	40%
Cervical lymphadenopathy	13	26%
Change in voice	15	30%
Nasal deformity	14	28%
Hearing difficulty	8	16%

Table 11. Presenting Symptoms

Nasal obstruction was present in most of the patients around 47 cases comprising 94 % of the cases presented with symptoms of nasal obstruction. Next common presenting feature was nasal discharge, followed by epistaxis, cervical lymphadenopathy, etc.

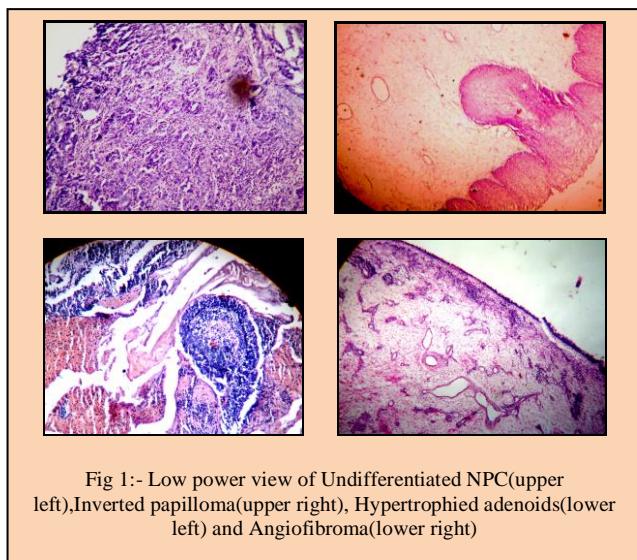


Fig 1:- Low power view of Undifferentiated NPC(upper left),Inverted papilloma(upper right), Hypertrophied adenoids(lower left) and Angiofibroma(lower right)

V. DISCUSSION

In this series of 50 cases of nasopharyngeal masses, both neoplastic and non-neoplastic masses were found in equal numbers i.e. 25 cases each. The non-neoplastic masses found in this study were adenoids and antrochoanal polyps. 16 cases of adenoids comprising 32 % and 9 cases of antrochoanal polyps constituting 18 % of the total cases were found. The neoplastic masses found were nasopharyngeal carcinoma, nasopharyngeal angiofibroma, inverted papilloma and olfactory neuroblastoma. Nasopharyngeal carcinoma was the most frequent neoplastic mass, comprising 30 % of the total

cases. Other neoplastic masses in the decreasing order of frequency are nasopharyngeal angiofibromas, inverted papillomas and olfactory neuroblastoma which constituted 14 %, 04 % and 02 % of the total cases respectively.

Biswas et al in 2002 carried out a similar clinical study on nasopharyngeal masses, where they found non-neoplastic masses were more frequent than the neoplastic masses. They reported that antrochoanal polyps were the commonest mass comprising 30 % of all cases followed by adenoids (23 %), angiofibroma (20 %) and nasopharyngeal carcinoma (13 %). In their study angiofibroma was the most common neoplastic mass of the nasopharynx. In the present study 50 cases were found but in the study done by Biswas et al a total of 30 cases were reported. This could be the reason for the varying results. Further, the ethnic backgrounds of the people in the present study along with the cultural traits are widely different in comparison to the study population of G. Biswas et al. This could explain the higher incidence of nasopharyngeal carcinoma in the present study.

In the present study, adenoids constituted the most common condition producing mass in the nasopharynx. 16 cases of adenoids were found which constituted 32 % of the total cases. In a study conducted on nasopharyngeal masses by G Biswas et al (2002), adenoids comprised 23 % of the masses. According to Bhargava et al, adenoids usually occur between the age of 3 years and 10 years. In the present study, approximately 75% of cases occurred in the 0-9 years age group. Thus, the age incidence of the present study is consistent with other studies. Males are more commonly affected than females. In the present study, a male to female ratio of 1.3: 1 was observed. The most common symptom was nasal obstruction. Other symptoms included mouth breathing, nasal discharge, deafness and otorrhoea. The present study revealed nasal obstruction in 100% of cases, nasal discharge in 60% and mouth breathing in 56.6% cases. Microscopic picture showed pseudostratified ciliated columnar epithelial lining and proliferation of lymphoid tissue in areas of extensive hemorrhage and necrosis. No other abnormalities were seen histopathologically.

Antrochoanal polyps constituted the second most common benign lesion in the present study. A total of 9 cases comprising 18 % of the total cases were found. Biswas et al (2002) found antrochoanal polyps to be the commonest mass in the nasopharynx constituting 30 % of the cases. According to Colman, Dandepath et al and Scott-Brown’s textbook, polyps are a disease of adolescence and young adult. In the present study, approximately 56% of cases occurred in the 10-19 year age group. Thus, the age incidence of the present study more or less is consistent with those of Colman, Dandepath et al and Scott Brown’s Otolaryngology. According to Drake Lee and Morgan and Scott Brown’s Otolaryngology , males are more commonly affected than females. Dandepath et al reported an almost equal incidence in males and females. In the present study, a male to female ratio of 1.3:1 was observed, which correlate the findings of Drake Lee and Morgan and Scott Brown’s otolaryngology. The present study revealed nasal obstruction in 100% of cases, nasal discharge (60%), headache (56.6%), frequent attack of cold (13.3%),

change in tone of voice (10 %), loss of sense of smell (6.6%) and nasal deformity and difficulty in hearing (3.3%). Histological analysis showed that the polyps were lined by ciliated columnar epithelium. The submucosa was edematous and infiltrated by inflammatory cells especially eosinophils and plasma cells. The histologic findings of the nasal polyps are consistent with those of other studies.

In the current study, 2 cases of inverted papillomas were found to produce mass in the nasopharyngeal region constituting 4 % of the cases, which is in accordance to findings of Sadeghi , who reported an incidence of 0.5-8% of primary nasal tumors. In the present study, 1 case occurred in the 50-59 year age group and the other case occurred in the 0-9 year age group. All cases were males (100 %). Most common symptoms were nasal obstruction and recurrent epistaxis, followed by mass in the nose and nasal discharge. Histologic analysis revealed a hypercellular thickening of the surface epithelium with downward invagination into the supporting stroma. The basement membrane appeared intact and of normal thickness. The neoplastic epithelium is squamous with prominent orderly basal cell proliferation. Epithelial maturation appeared uniform with minimal pleomorphism or atypical mitotic activity.

Nasopharyngeal angiofibroma is a benign but biologically active and locally aggressive tumour which can invade into surrounding structure and intracranially. In the present study, 7 cases of nasopharyngeal angiofibroma with were found constituting 14% of the total cases. In the present study, 100% of the cases occurred in the 10-19 year age group. All were males. Hicks et al, reported that they occur almost exclusively in males between 10 and 25 years of age. Bhargava et al, opined that most cases were of the adolescent group. F Shuler et al, quoted that it occurs almost exclusively in adolescents. Observations in the present study were comparable to others. Epistaxis and nasal obstruction were present in 100% of the cases and change in tone of voice in 75% of the cases. Histopathological examination revealed an intricate mixture of blood vessels and fibrous stroma. The vessels ranged from thin walled capillaries to venous sized, lined by single layer of endothelial cells. The fibrous stroma is composed of fibrous tissue with spindle cells.

The present study revealed 15 cases of nasopharyngeal carcinoma(NPC) constituting approximately 30% of the total cases of nasopharyngeal masses. NPC was the most common malignant mass of the nasopharynx. According to Scott Brown's Otolaryngology and Juan Rosai, nasopharyngeal carcinoma has bimodal age distribution with first peak between 10-20 years and second peak at 55-69 years. Hirayama reported that the incidence in both the sexes starts rising after the age of 20-24 and reaches a plateau between 45 and 54 years of age. In the present study one case was 8 ½ years and the other cases were above 30 years of age. 8 cases (53 %) were seen in the age group of 30-49 years and 6 cases (40 %) were seen in the age group of 50-69 years. These findings are more or less consistent with the findings of other workers. The sex incidence in the present study was found to be greater in males than the females. 13 cases (87 %) and 2 cases (13 %) were seen in males and females respectively. The

male to female ratio in this regard was 6.7: 1. Most of the cases of NPC (13 cases, 86 %) presented with cervical lymphadenopathy. 8 cases of NPC constituting 62 % presented with unilateral and 38 % presented with bilateral cervical lymphadenopathy. Other cases of nasopharyngeal carcinoma presented with nasal obstruction, epistaxis and hearing difficulties. These findings corroborate the findings of Jain, Damjanov and Linder and Juan Rosai , who stated nasal obstruction, epistaxis, blindness, multiple cranial nerve palsies, etc. as the most common symptoms. Histologic analysis revealed most cases of nasopharyngeal carcinoma as undifferentiated carcinoma (9 out of 15 cases constituting 60 % NPC) . These tumours showed microscopic picture consisting of broad sheets of large polygonal cells with vesicular nuclei, large prominent eosinophilic nucleolus, indistinct cell borders and surrounded by prominent mature lymphoid infiltrates. These findings are consistent with that of Damjanov and Linder and others. 2 cases showed the Regaud pattern and the rest showed the Schmincke type of growth pattern. Immunohistochemistry was done using CK and LCA antibodies in the tumours showing the Schmincke type of growth pattern. 4 out of 15 cases were of the keratinizing type comprising 27 % of the NPC cases. Histologically they showed keratinization and intercellular bridges. 2 of the cases were of the non keratinizing type (13% of NPC) and histologically they showed tumours comprising of stratified cells with sharp delineation from the surrounding stroma. No evidence of keratinization was seen.

Olfactory neuroblastomas are uncommon neoplasms that arise from the olfactory mucosa of the sinonasal tract representing 2-3 % of tumours in this region (D M Fletcher). In the present study, olfactory neuroblastoma was the second malignant mass seen and 1 case of a female 35 years of age was found, constituting 2 % of the total cases. The only case presented with nasal obstruction and difficulty in breathing along with unilateral cervical lymphadenopathy. Histopathology of the mass showed a cellular tumour composed of uniform small cells with round nuclei, scanty cytoplasm, indistinct nuclear membrane and a prominent fibrillary background. Some areas showed proliferation of vascular structures. Immuno-histochemistry with S100 and NSE were carried out.

VI. CONCLUSION

In the light of the results and observations of the present study we can say that though nasopharynx is a small anatomic area, a variety of common and rare lesions occur. Moreover, no single diagnostic modality can be conclusive and hence a combination of clinical, radiological and histopathological study is essential. Histopathological study alongwith a good clinical approach plays a very important role in this regard as it gives the confirmatory diagnosis. Therefore, it is an indispensable modality in the management of the cases presenting with a mass lesion in the nasopharynx. Further, a study of longer duration is required for proper follow up and to find out the exact incidence of different diseases producing mass in the nasopharyngeal region.

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