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Significance of biopsy in approaching cases of nasopharyngeal mass lesions in adolescence and adulthood: A retrospective study in Dhofar region, Oman

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Significance of biopsy in approaching cases of nasopharyngeal mass lesions in adolescence and adulthood: A retrospective study in Dhofar region, Oman

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Background: Adenoid tissue rarely persists in adolescence and adulthood period, It rarely represents a malignant process. Nasopharyngeal mass lesions may vary from simple adenoid hyperplasia to other benign and malignant lesions.

Materials and methods: A retrospective study done on sixty- six patients presented with a nasopharyngeal mass lesion to our institute in Dhofar, Sultanate of Oman where nasopharyngeal biopsy was done in all cases to differentiate benign from malignant lesions.

Results: The majority of the cases included in the study 60/66 (90.9%) represented benign lesions. The six cases with malignancy showed highly significant correlation with neck mass, ear pain, unilateral otitis media with effusion and suspicious appearance on endoscopy. Advanced age showed a highly significant difference between the malignant and non- malignant groups.

Conclusion: Nasopharyngeal biopsy should be reserved only to cases where associated (sinister features) exist along with the presence of nasopharyngeal mass.

Keywords: Adenoid hyperplasia; malignant; neck mass; otitis media.

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Introduction

Adenoidal tissue is one of the immunological defense mechanisms of the upper aero-digestive tract, It reaches its maximal size between three and seven years of age and it represents the most common nasopharyngeal mass lesion, The world literature suggests that adenoidal hypertrophy rarely indicates a malignant diagnosis, [1] However, it is not possible to differentiate neoplastic adenoidal tissue from benign hypertrophy based on the gross appearance alone, Nasopharyngeal mass lesions might range from simple adenoid hyperplasia to benign lesions as inflammatory, congenital cysts, and angiofibroma or malignant lesions as nasopharyngeal carcinoma or lymphoma.

Nasopharyngeal carcinoma (NPC) is a malignant tumor arising from the mucosal lining of nasopharynx. Nasopharyngeal carcinoma is a relatively uncommon malignant disease with an incidence of less than 1:100,000, [2,3] NPC is considered a rare entity in Oman and usually presents at a late stage, Neck mass and nasal symptoms are the most common presentation in most cases of NPC in Oman, It is most common in Muscat followed by the Ash Sharqiyah region, [4] Dhofar region, in Oman, is known with the production and use of frankincense, The resin is obtained by slashing the bark of the Boswellia sacra tree and allowing the sap to bleed out and harden, Frankincense can be used in perfumery and aromatherapy, skin care, and traditional medicine, [5] The long-term use of frankincense (in smoke form) is associated with an increased risk of squamous cell carcinoma of the respiratory tract, [6] Dhofar as a coastal region is also famous with the process of preserving and canning of highly salted fish (known locally as Al-Maleh) which adds another risk factor for the development of nasopharyngeal carcinoma.

Juvenile nasopharyngeal angiofibroma is a very rare tumor which is highly vascular, uncapsulated and locally invasive tumor presenting mostly with epistaxis, Its incidence has been cited to be 0.05 % of all head and neck neoplasms as concluded in many literature studies. [7]

For the purpose of identifying nasopharyngeal mass lesions in Dhofar region, Sultanate of Oman, this retrospective study was done using the medical records from the ENT department, for all adolescent and adult Omani patients with nasopharyngeal mass lesions who presented to Sultan Qaboos hospital (the main regional hospital in Dhofar region) from June 2014 till June 2017, where nasopharyngeal biopsying was done for all the cases included in the study.

Material and Methods

A retrospective chart analysis was performed on all adolescent and adult cases with nasopharyngeal mass lesions that presented to Sultan Qaboos Hospital, Dhofar, Sultanate of Oman between June 2014 and June 2017, Local ethics committee approval was obtained for the study, This protocol of nasopharyngeal biopsy for this age group was already followed since 2004 in our institute, however we included only the last three years in our study due to lack of an accurate recording system (AlShifa) for patients' files before that.

Data was collected from the hospital patient data system (AlShifa) where all the cases included in the study had underwent nasopharyngeal biopsy for nasopharyngeal mass lesion under local anesthesia in the operating theater or the outpatient clinic, The objectives of the current study are to 1) evaluate the need for nasopharyngeal biopsy in cases of nasopharyngeal mass lesions in adolescence and adulthood, and 2) to identify if there is a significant correlation between specific factors as age, gender or a particular clinical manifestation with malignant lesions if any.

The study included all Omani patients whose ages are equal or more than 14 years with nasopharyngeal mass.

Exclusion criteria included any patient with known nasopharyngeal tumor with recurrence or residual disease, any adolescent case with profuse nasal bleeding, any case of known recurrent adenoid treated before by adenoidectomy, and non- Omani patients.

Epidemiological factors as age, gender were recorded for any possible correlation with the biopsy results, Also, clinical manifestations as ear pain, headache, neck swelling, epistaxis, and examination findings as otitis media with effusion or presence of suspicious nasopharyngeal mass on nasal endoscopy were recorded for any possible correlation.

All nasopharyngeal biopsies were done under topical anesthesia using nasal pack soaked with lidocaine HCL 2% and epinephrine 1: 200000. A 4 mm 0º rigid endoscope was introduced through the inferior meatus (Storz, Tuttlingen, Germany). Biopsy was performed using a punch forceps and all biopsy specimens were put in formalin and then embedded in paraffin. Sections cut from the paraffin blocks were stained with hematoxylin and eosin for histopathological analysis.

Age is presented as Median and Interquartile Range, comparison between the two groups was made by Mann-Whitney Test as the data was not normally distributed, Discrete data were presented as numbers and percentages, Chi-Square Test was used to compare between the malignant and the non malignant groups. Odds ratios (OR) and their 95% confidence interval (CI) were presented using univariate logistic regression. Statistical significance was determined as $P < 0.05$ using SPSS, version 21 (SPSS Inc., Chicago, USA).

Results

Sixty six nasopharyngeal biopsies were performed during the study period from June 2014 till June 2017, All cases were fulfilling the inclusion criteria. Biopsying was tolerated by all patients with no recorded complications.

The overall negative rate of malignancy of nasopharyngeal biopsies done in this study was 90.9% (60/66), Adenoid hyperplasia reflected the majority of the biopsy results, 86.36% (57/66), Two cases were inflammatory cysts and one case was Thornwaldt's cyst **(Fig. 1)**.

The study included 42 male patients (63.6%) where five showed malignancy and 24 female patients (36.4%) with only one presented with malignancy. Age of included patients ranged from 14-88 years with an overall average of 25. 257 years± SD 14. 328.

In the non malignant group, the average age of the patients was 22.85 years ± 10. 779. Whilst in patients with malignant lesions the average age was 49.333 years ± 23.079 as shown in **Table 1**. There is a highly significant difference between the two groups regarding age **(Table 1)**, By logistic regression OR was 1.096, CI 1.032- 1.165 with significant correlation **(Table 2)**.

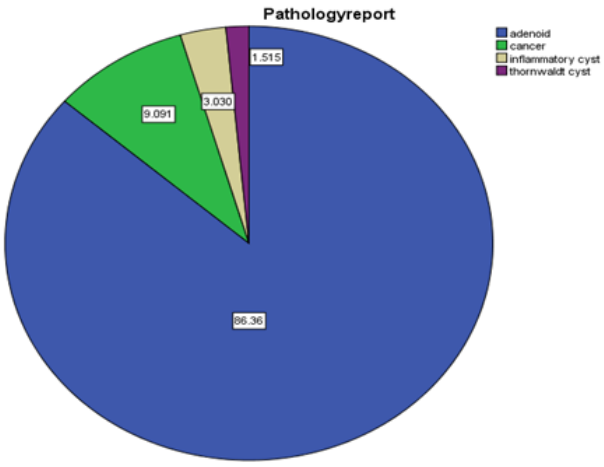

Fig 1 Results of pathology specimens from the nasopharynx (%)

Table 1 Median and Interquartile Range for age in malignant and non malignant groups

Group	N	Median ± Interquartile Range	M-W test	P value
Non Malignant	60	18 ± 10	3.109	0.002
Age Malignant	6	48.5 ± 32		
Total	66	19 ± 11		

Table 2 OR, CI 95% and P value between age and malignancy

	OR	CI 95%	P value
Age	1.096	1.032-1.165	.003

Table 3 shows the different results of neck swelling, otitis media with effusion, ear pain, headache, bleeding per nose and presence of a suspicious mass on endoscopy and their correlation with malignancy.

The presence of a suspicious mass on endoscopy was found in five cases only; these five cases were found to have malignancy in biopsy results with a highly significant correlation.

Unilateral neck swelling was found in five out of the sixty six cases, These five cases were found to have malignant lesions as seen from histopathology results, Unilateral neck swelling was found to have a highly significant relation with malignant lesions.

Ear pain was also encountered in 5/66 cases and these five cases were found to have malignant lesions.

Type A tympanometry was the most common finding in non malignant lesions while unilateral type B tympanometry reflecting unilateral middle ear effusion was the most common finding in malignant lesions with a highly significant relation.

The most common clinical manifestation in the malignancy group was a unilateral cervical mass, ear pain, middle ear effusion (5/6, 83.3%), followed by bleeding per nose (3/6, 50%).

The most common endoscopy finding in the malignant group was the presence of a suspicious mass (5/6, 83.3%).

Table 3 P value for the different parameters and their relation with malignant and non malignant lesions

		Group		X^2	P value
		Nonmalignant (60)	Malignant (6)		
Neck swelling		0 (0%)	5 (83.3%)	54.098	.000
Ear pain		0 (0%)	5 (83.3%)	54.098	.000
Otitis media with effusion	A	51 (85%)	0 (0%)		
	Unilateral C	0 (0%)	1 (16.7%)	66.0	.000
	Bilateral C	7 (11.7%)	0 (0%)		
	Unilateral B	0 (0%)	5 (83.3%)		
	Bilateral B	2 (3.3%)	0 (0%)		
Suspicious mass		0 (0%)	5 (83.3%)	54.09	.000

Data presented as number and percent

Discussion

The literature supports that adenoidal tissue is benign and rarely needs a biopsy except if there is a particular clinical manifestation or if the patient belongs to an endemic area.

Adenoids in adults, however can simulate nasopharyngeal tumors. [8]

Nasopharyngeal carcinoma represents about 85-90% of malignant lesions of the nasopharynx with lymphoma representing the rest mainly. Some environmental factors are correlated with malignancy as preserved food and salted fish. [9]

Nasopharyngeal angiofibroma is a benign yet, a locally aggressive disease that commonly affects young adolescent boys and characterized by severe bleeding that may be life threatening. It arises from either the lateral wall or the roof of the nasopharynx especially the sphenopalatine foramen. [10]

In a study done from January 2003 to August 2011 in Sultanate of Oman, only two cases of nasopharyngeal carcinoma were encountered in Dhofar region. [4]

Sultan Qaboos hospital is the main regional hospital in Dhofar region to which all cases with nasopharyngeal mass lesions are referred, We are implementing a protocol of biopsying all the nasopharyngeal mass lesions in adolescence and adulthood for the sake of differentiating cases with simple persistent adenoid hyperplasia from cases with various pathologies ranging from cysts to benign and malignant lesions.

There are only a few published studies on the benefits of routine nasopharyngeal biopsy in adults. One large-scale Taiwanese study examined the relationship between initial clinical manifestations and nasopharyngeal biopsy results. [11]

Although they correlated epistaxis and neck mass significantly with cases of malignant nasopharyngeal lesions as proved by biopsy, yet cases of non-cancerous masses due to adenoid hyperplasia were also encountered in the study with the same presentation where initially they thought to be malignant.

In 1990, Kamel et al., reviewed 35 adult patients with adenoid hypertrophy where five had bilateral secretory otitis media, 18 had nasal obstruction and four presented with snoring. After adenoidectomy, all the thirty five adenoid biopsies were free of malignancy and proved to be only adenoid hyperplasia. [12]

In this study, the overall benign lesions were 60/66 (90.9%), This is comparable to J Mitchell et al., study (13) where the percentage was 84% out of 110 cases, While, in Kamel et al., study this percentage reached 100% with no encountered malignant lesions out of the thirty five patients included in the study. [12]

In this study, we encountered a highly significant relation between increased age and malignancy (OR 1.096, CI 95% 1.032-1.165, p value .003).

In literature, an overall peak of malignancy incidence is described in 50- 60 years of age with a male to female ratio of 2:1, In high risk areas, such as Hong Kong, the NPC incidence in each sex rises sharply from the age of 20 onward and also reaches a plateau between 40 and 60 years of age. [14] In our study, the average age of the patients with malignant disease was around 49 years with only one case of 19 years old. In our study, five of the six patients with malignant lesions are males.

As mentioned in the literature, neck nodes might be the initial presentation of nasopharyngeal carcinoma (between 50- 90%) and about one third might present with otitis media with effusion (OME). [9]

In our study, five of the six malignant cases (83.3%) presented with OME and the same percentage for unilateral cervical lymphadenopathy with highly significant relation with malignancy.

In literature, blood tinged mucous is found in about half of the cases of nasopharyngeal carcinoma. [9] In our study, we found only three out of the six cases with blood tinged secretions from the nose,. No cases of profuse nasal bleeding were encountered in our study. Only one case with headache was encountered.

One more significant factor that has been encountered in malignant cases is ear pain which has been found in five of the six malignant cases with a highly significant correlation with malignancy.

It is well known that it is difficult to exclude NPC based on the nasopharyngeal mass lesion appearance as some

tumors might spread submucosally. [15] This is why it is mandatory to take a biopsy in suspicious cases with (sinister features) or lymphadenopathy even with normal appearance of nasopharyngeal mucosa or the presence of adenoid hypertrophy.

In our study, there were five cases with suspicious mass appearance on endoscopic examination. These five cases proved to be malignant highlighting the importance of this factor also in suspecting cases that need biopsy of the nasopharynx.

Our study showed that the actual number of malignant cases in relation to the included population was not huge which might reflect the fact of (no need) for biopsy of nasopharyngeal mass lesions except in highly selected cases as described. However, our study is a retrospective one and might be subjected to some selection bias, especially with the fact of small sample size and the low incidence of nasopharyngeal tumors especially nasopharyngeal carcinoma in Oman.

Conclusion

The true incidence of adenoid hypertrophy in adolescence and adulthood is unknown. Previous studies suggest that persistent adenoid in these age groups are usually benign.

Our data suggest that any patient with nasopharyngeal mass lesion without risk factors as advanced age, or (sinister features) as neck mass, unilateral otitis media with effusion ear pain, or suspicious mass on endoscopy in a non-endemic area should not be subjected to biopsy.

Efficient clinical history taking and examination is very important in avoiding unnecessary nasopharyngeal biopsy in cases of nasopharyngeal mass lesions, especially in young patients in non-endemic area without a history of suspicious clinical manifestations.

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Conflicts of interest

There are no conflicts of interest.

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