

## Role of Fine Needle Aspiration Cytology in Head and Neck Lesions: A Prospective Study

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### Abstract

*Background and Aim:* The swellings in head neck region are of great clinical significance. The aetiology of swellings may vary from cysts, benign tumours and malignancy to metastatic tumours. So, these neck swellings are a great dilemma to surgeon for diagnosis and treatment. The aim of present study is to diagnose the different types of cysts out of total head neck swellings because these cysts are commonly present in head neck region. *Materials and Methods:* In this study 100 patients of different cystic neck swelling were studied over a period of five years from 2014-2016 to compare the findings with clinical diagnosis, FNAC and histopathological report for its diagnostic reliability. This study was done in surgery department of mcgann teachin hospital and Medical College Hospital shimogha. Patients of 1-70 yrs age were taken for study. History of patients was taken, clinical examination of swelling was done followed by FNAC and histopathology examination of postoperative specimen of neck swelling. *Results:* The analyzed data was presented by various tables. Out of these 100 cases of neck swellings 40 cases were of various cysts. 16 were males and 24 were females. The male, female ratio was 1:1.5. Age range was 1-70 years with maximum frequency in the 1-30 yrs of age. Clinical, cytological and histopathological diagnosis was done in all the cases. Out of the cases studied 50% were thyroglossal cyst, 25% were Epidermoid cyst, 15% were dermoid, 10% of total were brachial cyst, retention cyst and ranula. *Conclusion:* It is concluded that head and neck

swellings are very common conditions encountered. Our study found that simple clinical examination followed by FNAC and histopathology is simple, quick, inexpensive and minimally invasive technique to diagnose different types of head and neck swellings. In this study out of different head and neck cystic swellings thyroglossal cyst was most common followed by dermoid cyst.

**Keywords:** Cytology; FNAC; Lesions.

### Introduction

The evaluation of a neck mass is a common clinical dilemma and a condition to which clinicians routinely encounters. Cystic neck swellings in the neck arise from a diverse range of tissues and pathological disorder. Common clinical swellings in neck are lymphoid swellings, salivary gland enlargement, thyroid enlargement & brachial cysts, etc. The approach to diagnosis relies on a thorough history and an appropriate examination including the internal examination to exclude an occult primary malignancy. The typical feature of fluctuance is many times not elicited because the contents of cyst can be under tension. Transillumination is not performed now-a-days. Aspiration of cyst, USG of swelling are done usually but CT and MRI can be done in some cases where needed. Clinical presentation of cyst, its anatomical location, extent, its internal composition and vascularity as seen on Doppler USG and contrast CT help us in accurate interpretation of these swellings [1]. Definitive treatment is usually surgical excision. Complete excision of the cyst is advocated to avoid the complications of infection, which will make resection more difficult and recurrence more likely. So with benign disease repeat aspiration can be considered. No intervention can be an option if there is significant co-morbidity, absence of functional

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or cosmetic impairment or there is reluctance by the patient to undergo surgery. Commonly presenting cysts in the neck are congenital neck masses which include branchial cleft cysts, thyroglossal duct cysts (TGDCs), ectopic thymus cysts, dermoid and teratoid cysts, cystic vascular abnormalities, and lymphatic malformations such as the cystic lymphangioma [2]. In addition to these, other masses are metastatic squamous cell carcinoma, acquired laryngoceles, and cystic schwannomas. They usually result from embryonic structures that have failed to mature or have persisted in an aberrant fashion [3]. This article mainly focuses on the cystic swellings of neck. FNAC (fine needle aspiration cytology) is a simple, quick and cost effective method to investigate about superficial masses in the head & neck [4]. It can be diagnostic as well as therapeutic in cystic swellings [5]. A thyroglossal duct cyst (TGDC) is the most common mass found in the midline of the neck and most commonly seen in children. Cysts are usually noted during the first decade of life as a soft tissue mass located on the midline at or immediately adjacent to the hyoid bone. The mass is usually located at or below the level of the hyoid bone. It occurs with equal frequency in males and females. The literature reports that most of these lesions occur in patients younger than 30 years. They may be found in as many as 7% of the population. Most commonly, they present in the first decade of life. However, they are also seen in adults [6]. Thyroglossal cyst (TGC) may be mistaken for thyroid swelling. Diagnosis can usually be achieved on an outpatient basis [7]. Interestingly, over the last decade, a number of older patients are presenting with a TGDC, some of whom are aged 80-90 years. More than 90% of branchial cleft anomalies arise from the second branchial cleft system. Approximately 8% of branchial cleft anomalies arise from the first branchial cleft system.

Cysts which arise from the 3rd and 4th branchial cleft system occur rarely. Branchial cysts are more common than branchial sinuses or fistula. The location of the cyst can be anywhere along the course of the fistula but occur most commonly below hyoid bone in the anterior triangle of neck. Branchial cleft cysts manifest in early childhood and usually occur with an acute and painful enlargement of the cysts secondary to an upper respiratory infection.

Dermoid cyst is a mass containing skin, hair and skin glands that are trapped under the skin, usually located in the area drawn from the middle of the forehead to the bottom of the neck. Dermoid cyst is recognised as a small, painless swelling on the face, scalp, nose or neck. They can range in size from 1-4 cm across. These cysts are to be differentiated from other congenital neck masses, which can be done with

careful physical examination and other investigations. Lymphatic malformations, which include lymphangioma and cystic hygroma, are areas of localized abnormal development of the lymphatic system. Approximately half of all lymphatic malformations are diagnosed at birth, and 90% are diagnosed by age 2. Most of these neck cysts present as slow-growing cystic cervical masses. A hemangioma is an abnormal growth of blood vessels that are formed before or shortly after birth. Hemangiomas usually start to grow larger shortly after birth (proliferative stage) reaching a peak at 18 months to 2 years of age. At that point, most hemangiomas will start to shrink involute. This process may take several years.

## Materials and Methods

The present study was done on 100 cases of head and neck swellings done in Surgery department of MCG Hospital and Medical College Shimoga 2014-2016. Out of which 40 cases were of cystic swellings. All patients were asked about history related to neck swelling and relevant questions to the etiological cause, present, past and family history. The swelling was examined clinically and aspiration was done to ascertain that it was a cystic swelling followed by surgical excision of cyst and histopathological examination.

## Results

The study included 40 cases of cystic swellings with age range from 1 to 70 years. Out of these 40 cases 40% were male and 60% were female. Male to female ratio was 1:1.5. Maximum incidence was observed in the age group of 1 to 30 years and out of 40 cases 75% were below 50 years of age. Among the diagnostic outcome, higher incidence of lesion was in the neck region than in the head region. In our study 75% lesions were midline, 25% were lateral.

Thyroglossal cyst involvement (50%) was more common than other lesion. It involved about 30% of females and 20% of males. Incidences of Epidermoid cyst (25%) was also more in females (15%) than males (10%) while dermoid cyst was present in 15% of patients. In addition to this 10% are branchial and ranula were present [Table 1].

In 20 cases of TGC, 16 (80%) were present in 1-30 yrs of age, 4 (20%) in 30-50 yrs of age. In Epidermoid cyst 4 (10%) patients were of 1-30 yrs age group, 4

(10%) were of 30-50yrs age and 2 (5%) were in 50-70 [Table 2].

Thyroglossal duct cysts, the most common congenital neck cyst, accounted for 54.68% of all cases. These were followed by cystic hygroma (25.08%), brachial cleft cysts (16.31%) bronchogenic cysts (0.91%), and thymic cysts (0.30%). Out of the total, nine cases (2.72%) remained unclassified [Table 4]. In our study, Thyroglossal cyst involvement (50%) was more common than other lesion. It involved about 30% of females and 20% of males. They were all located on the midline or adjacent to the hyoid bone. Cysts are usually noted during the first decade

of life as a soft tissue mass located on the midline at or immediately adjacent to the hyoid bone. In this study 10% had brachial cyst, out of total 5% males and 5% females had this type of cyst. These cysts were located along the anterior border of the sternocleidomastoid muscle. The epithelial lining was stratified squamous, pseudostratified columnar or mixed. In study of Yi-Yueh Hsieh et al., [9] 54 patients 16.31% of the total had branchial cleft cysts. Median age of diagnosis was 16 yrs in our study as compared to Yi- Yueh Hsieh et al., [9] where it was 11yrs. These cysts are characteristically associated with abundant lymphoid tissue in the stroma. There were 83 (25%) cases of cystic hygroma in study by Yi-

**Table 1:** Sex incidence'

Type of cyst	No.	Male		Female	
		Percentage	No.	Percentage	No.
Thyroglossal cyst (TGC)	8	20%	12	30%	12
Epidermoid cyst	4	10%	6	15%	6
Dermoid cyst	2	5%	4	10%	4
Branchial cyst ranula, retention cyst	2	5%	2	5%	2

**Table 2:** Age incidence

Lesion	1-30 yrs	30-50yrs	50-70yrs
Thyroglossal cyst	16 (80%)	4(20%)	0
Epidermoid cyst	4 (10%)	4 (10%)	2 (5%)
Dermoid cyst	2 (5%)	3 (7.5%)	1 (2.5%)
Branchial cyst and Ranula	1 (2.5%)	2 (5%)	1 (2.5%)

**Table 3:** Comparison of location

Study	Mid line cysts	Lateral cysts	Entire neck mass
Present study	75%	25%	0%
Al-Khateeb TH et al.,[2]	66%	22%	12%

**Table 4:** Comparison of type of cystic swelling

Study	TGC	Epidermoid cyst	Dermoid cyst	Branchial	Cystic hygroma
Present study	50%	25%	15%	10%	Not seen
Al-Khateeb et al., [2]	53%	11%	22%	6%	Not seen
Yi-Yueh Hsieh et al., [9]	54% approx		16% approx	4% approx	25% approx

Yueh Hsieh et al., [9] which was the second most common pediatric neck cystic lesion. Cystic hygromas are thought to arise from a failure of the lymphatic system to communicate with the venous system in the neck and is most frequently found in the lateral cervical region.

## Discussion

Swellings in head neck region are of great concern to the patients. Any patient presenting with swelling has to be examined thoroughly clinically as well as

through radiological investigations and pathological tests. In the present study of 40 cases of various head and neck cysts different data were obtained about age of the patients, sex incidence, location of cyst and type of cyst. The results achieved in the present study were compared with different studies. The differential diagnosis is based upon the location and histology of the epithelium and the surrounding stroma. There was higher incidence of lesion is in the neck region than in the head region. In our study the majority of lesions presented as painless neck mass similar as compared to Al-Khateeb TH et al., study [2]. In our study 75% lesions were midline, 25% were lateral.

This is in comparison to Al-Khateeb TH et al., [2]. In his study there were 66% mid line masses, 22% were lateral neck masses and 12% were entire neck masses [Table 3]. Male to female ratio is 1:1.5 in our study similar to his study showing same ratio 1:1.2 with most lesions affecting females.

But in contrast in study by Yi-Yueh Hsieh et al., [9] a male to female ratio of around 1:6 was seen. In our study maximum incidence was observed in the age group of 1 to 30 years and out of 40 cases 75% were below 50 years of age. The mean age group was 16 yrs with maximum no of cases (38%) in first decade in study of Al-Khateeb TH et al., [2]. The median age at diagnosis was 5 years in study by Yi-Yueh Hsieh et al., [9]. These findings were similar to those of previous reports [10]. Paediatric neck swellings differ from that in adults in that malignancy is much less likely [11]. In our study incidence of TGC was 50%, Epidermoid cyst was 25% Dermoid cyst were 15% while brachial cyst and ranula was present in 10% of patients. In study of Al-Khateeb TH et al., [2] the most frequent mass was TGC 53% followed by Brachial cyst in 22%, dermoid cyst in 11%, hemangioma in 7% and lymphangioma in 6% cases. In study by Yi-Yueh Hsieh [9] occur adjacent to carotid sheath anywhere from hyoid bone to anterior mediastinum [8]. In addition to these masses, deep neck infection like quinsy and submandibular abscess can present as neck masses seen more commonly in children.

### Conclusion

It is concluded from present study that there is wide spectrum of lesions that can present as head and neck swellings which have to be diagnosed and treated carefully. Thyroglossal duct cysts were the most commonly found congenital cervical cyst, followed by epidermoid cysts, dermoid cysts, and branchial cysts. Since each type of cyst has its unique location in the neck and is highly associated with its embryonic origin, complete and precise clinical information is a prerequisite in order to make accurate diagnoses of these cystic swellings.

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