

## Clinical Presentations and Management of Thyroglossal Duct Cyst and Sinuses

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### ABSTRACT:

#### BACKGROUND:

The thyroglossal duct cyst results from a failure in obliterating the embryonic duct produced during thyroid migration and it represents the most common type of developmental cyst encountered in the neck region. Ectopic thyroid tissue neoplasia is rare, and it is even rarer when associated with the thyroglossal duct cyst.

#### OBJECTIVE:

To study the clinical behavior, distribution and treatment of thyroglossal cyst and fistula.

#### MATERIALS AND METHODS:

A prospective study carried out during the period 2002-2011, in the otolaryngology departments of Al Diwaniyah Teaching Hospital and Gazi Hariri Hospital, 72 patients suffering from thyroglossal cyst and sinuses were diagnosed and treated (60 cysts and 12 sinuses). The data were collected on the basis of history, physical examination, investigations, management and follow up.

#### RESULTS:

A seventy two patients complaining from thyroglossal duct cyst and sinuses were diagnosed and treated. 45 male (62.5%) and 27 female (37.5%). The commonest age of presentation is the second decade, 33 patients (46%). The most common clinical presentation of thyroglossal duct cyst is a midline neck mass and a midline anterior neck discharging opening in cases of thyroglossal sinuses. The thyrohyoid region is the most common location of both thyroglossal cysts and sinuses. The histological diagnosis in all the cases was benign (100%). All the patients were managed by Sistrunk s operation. The recurrence was seen in only one patient (1.3%). The incidence of carcinoma in the cysts or sinuses was 0.0%.

#### CONCLUSION :

Thyroglossal cysts and sinuses are quite prevalent. Thyroglossal cyst usually appears as a midline swelling in the prehyoid region of the neck. The etiology of thyroglossal sinuses in this study is mostly iatrogenic which means more awareness is required about diagnosis and proper management of thyroglossal cyst. The standard surgical approach is Sistrunk operation for both thyroglossal cyst and sinuses with low recurrence rate.

**KEY WORDS:** thyroglossal cyst, thyroglossal fistula, sistrunk operation.

### INTRODUCTION:

Thyroglossal duct cyst is a well recognized developmental abnormality. The thyroid gland is originally located in the floor of the pharynx between the tuberculum impar (the first pharyngeal arch) and the copula (the second and third pharyngeal arches) during the 4<sup>th</sup> week of fetal life <sup>(1)</sup>. During development, the thyroid gland reaches its final position in front of the trachea and leaves the thyroglossal duct, a narrow canal with an epithelial lining along the

descending route of the thyroid gland. Normally the thyroglossal duct completely disappears before the 10<sup>th</sup> week <sup>(1,2)</sup>. However, if the thyroglossal duct is not obliterated, the secretory epithelium of the thyroglossal duct may result in thyroglossal duct cyst. The thyroglossal tract extends from the foramen cecum at the dorsum of the tongue to the thyroid gland. Any part persist causes sinus, fistulae or cyst. Most of the sinuses are acquired following rupture or incision of an infected thyroglossal cyst. Occasionally, a sinus tract is present in the midline without a visible cyst. This midline sinus tract represents the remnant of the thyroglossal duct. It may open in

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the region of the hyoid bone or lower above the sternal notch. The sex distribution of thyroglossal duct cyst is equal and the age range is from birth to 70 years with a mean age of 5.5 years. 70% present as midline swellings and the remainder can be found as far lateral as the lateral tip of the hyoid bone. 40% present below 10 years of age, 65% present less than 35 years of age<sup>(3)</sup>. Seventy percent are diagnosed in childhood and 7% are diagnosed in late adulthood. The epithelial lining of the thyroglossal duct cyst is variable, most commonly it is pseudo-stratified ciliated columnar but it may be squamous. Malignant neoplasms rarely arise in thyroglossal cyst in less than 1%<sup>(4)</sup>. It is often diagnosed incidentally after surgical excision. 94% are of thyroid origin and 6% are of squamous origin<sup>(5)</sup>. The malignancy often found is papillary carcinoma<sup>(5,6,7)</sup>. The incidence of thyroglossal duct cysts and sinuses are 72% and 55% respectively among other cysts and congenital fistulae of the face and neck<sup>(8,9)</sup>. It is important to confirm the presence of normal thyroid gland before doing Sistrunk's operation because inadvertent removal of an ectopic thyroid gland may result in hypothyroidism<sup>(10)</sup>. The incidence of ectopic thyroid tissue is 1-2%<sup>(6)</sup>. Therefore, preoperative ultrasonography and thyroid scan are necessary to rule out the possibility of the ectopic thyroid gland. In location, the thyroglossal duct cyst are 2% intralingual, 24% suprahyoid, 61% thyrohyoid and 13% are suprasternal which shows that one quarter of the cysts are above the hyoid bone and three quarters below it. The

thyroglossal duct cysts and sinuses are managed by Sistrunk's operation<sup>(11)</sup>. The recurrence rate after this operation is 4%<sup>(12)</sup>.

### AIMS OF THE STUDY:

To study the clinical behavior, distribution and treatment of thyroglossal cyst and fistula.

### MATERIALS AND METHODS:

During the period between February 2002 and March 2011, in the otolaryngology department of Al-Diwaniyah Teaching Hospital and Gazi Hariri Hospital, 60 patients with provisional diagnosis of thyroglossal duct cyst and 12 patients with provisional diagnosis of thyroglossal sinus were included in the study. A detailed history, clinical examination and routine investigations were carried out. We record the age, gender, diagnostic methods, and surgical management for all patients. Laboratory tests (full blood count, blood film, serology and biochemical investigations), neck and chest radiography, ultrasonic scan and thyroid function tests, to rule out the possibility of ectopic thyroid, were done to all patients. Sistrunk's operation were done to all patients with thyroglossal duct cyst and sinuses. The follow up was carried out for a minimum 6 months period. All of the specimens were sent for histopathological examination to confirm the diagnosis and to exclude thyroid carcinoma.

### RESULTS:

A seventy two patients complaining from thyroglossal duct and sinuses were diagnosed and treated, 45 male (62.5%) and 27 female (37.5%). The commonest age of presentation is the second decade of life.

**Table 1: Age and gender distribution of the patients with thyroglossal duct cysts and sinuses.**

Age	Male	Female	Total no.
5-10 years	07	02	09
11-20 years	20	13	33
21-30 years	11	07	18
31-40 years	07	05	12
Total	45	27	72

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The most common clinical presentation of thyroglossal duct cyst is a painless midline neck mass while in case of thyroglossal sinus is midline discharging opening. Two patients presented with tender inflamed cysts, these patients treated with antibiotics initially until the

infection subside and then operated upon. The most common cause of thyroglossal sinus was iatrogenic, 10 patients (83%) of the 12 with thyroglossal sinus gave a history of surgical intervention on a previous cyst while 2 patients denied any history of a cyst or surgical trauma.

**Table 2: Distribution of the clinical presentations for patients with thyroglossal cysts and sinuses.**

Symptoms	No. of patients
Painless midline neck mass	57
Painless lateral neck mass	01
Painful midline neck mass	02
Discharging midline neck sinus	12
Total no.	72

The level of the cysts and sinuses in the neck were as follows: 3 patients (4.5 %) in the suprahyoid region, 67 patients (93%) in the

thyrohyoid region and only 2 patients (2.5%) below the level of the thyroid cartilage.

**Table 3: The location of the thyroglossal duct cysts and sinuses at the time of presentation.**

Location	No. of patients	Percentage %
Intralingual	00	0%
Suprahyoid	03	4.5%
Thyrohyoid	67	93%
Suprasternal	02	2.5%
Total	72	100%

Histological examination was done to all the specimens and it was benign in all patients. No recurrence surgical treatment was detected in case of thyroglossal duct cyst giving 100% success rate; while in thyroglossal sinus there is one case with recurrence, (i.e.) 91.6% success rate.

### DISCUSSION:

Thyroglossal duct cyst are localized towards the midline, between the base of tongue and the pyramidal lobe of the thyroid gland.<sup>(4)</sup> In our study the most common clinical sign was a non – tender , mobile neck mass , usually in close proximity to the hyoid bone , less often , thyroglossal duct cyst may show signs and symptoms of secondary infection or present as a discharging sinus . The cystic mass is situated anteriorly towards the midline of the neck, which moves with tongue protrusion and swallowing and it transilluminates. In rare cases, the cysts are

situated laterally<sup>(13)</sup>. In our study there is only one patient with laterally situated cyst. Hatada T. et al report one case of an intrathyroid thyroglossal cyst<sup>(14)</sup> while in our study there were two thyroglossal cysts at the level of the thyroid gland. Thyroglossal sinuses are usually presented as a persistent mucoid discharging opening from the midline of the neck.

In our study the number of patients below the age of 10 years were 9 patients (12.5%) and less than 30 years were 60 patients (83.3%) as compared with the study conducted by Brewis C. et al<sup>(3)</sup> in which it was 40% and 60% respectively . In a study conducted by Broussau V J et al<sup>(15)</sup> there was a bimodal distribution for age at presentation of thyroglossal duct cyst but this finding was not present in our study.

The factors associated with recurrence are: Inaccurate initial diagnosis, infection, unusual

presentation and inadequate tissue resection from the tongue base.

The level of surgeon training affects the surgical outcome<sup>(16)</sup>.

Follow up of the patients continue for 6-12 months and the recurrence rate was found to be 1.3% (one patient) as compared to the studies of Dedivitis RA et al<sup>(17)</sup>, Michelini ME et al<sup>(18)</sup>, Turkyilmaz Z et al<sup>(12)</sup> in which it was 1.82%, 11.8%, 4% respectively. The etiology of the majority of thyroglossal sinuses is iatrogenic, which means that more awareness and higher index of suspicion is required regarding the diagnosis and proper management of the thyroglossal cyst by Sistrunk procedure.

Approximately 200 cases have been reported in the literature worldwide, diagnosed as papillary carcinoma arising from the thyroglossal duct<sup>(19)</sup>.

In our study no malignancy was detected during histopathological examination of the removed cysts and sinuses.

### CONCLUSION:

Thyroglossal duct cyst in most of the cases appears as an asymptomatic swelling in the prehyoid region of the neck.

The majority of cases of thyroglossal sinuses are iatrogenic which means that more awareness is required regarding the diagnosis and proper surgical management of thyroglossal cyst. Incision and drainage of a midline cystic neck mass should be avoided to prevent the development of thyroglossal sinus which is more difficult to resect totally because of the development of scarring.

The standard surgical approach to thyroglossal duct cyst and sinus is Sistrunk operation with low recurrence rates. Malignancy within a thyroglossal duct cyst is very rare but should be included in the differential diagnosis of a neck mass, for this reason, in addition to confirmation of the diagnosis, any cystic midline neck mass or sinus should be sent for histopathological examination after excision.

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