

# Management of Thyroglossal Duct Cyst

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## ABSTRACT

**Aim:** To analyze presentation and approach to management in patients with thyroglossal duct cyst.

**Design:** A descriptive study.

**Setting:** Department of ENT, Head & Neck Surgery, PGMI, Lady Reading Hospital Peshawar

**Patients and methods:** This study included twenty patients with thyroglossal duct cyst over a period of five years. All patients were admitted. Detailed history, clinical examination and relevant investigations were done. Cervical ultrasonography was performed in all these cases. Fine needle aspiration cytology (FNAC) was done in two cases with the mass in the suprahyoid position. Sistrunk operation was performed in all patients. Excised tissue was sent for histopathological examination.

**Results:** There were 12 male and 8 female with male to female ratio of 1.5:1. The average age at diagnosis was 8 years (range 5-11years). Eighteen patients presented with a midline cystic neck mass while in two patients the presentation was a recurrent draining fistula. Ultrasound studies were done in all patients which clarified the nature and position of the cyst and the presence of thyroid gland in its normal position. In two patients with suprahyoid mass fine needle aspiration confirmed the clinical diagnosis of thyroglossal cyst. All twenty patients underwent sistrunks procedure. Histopathological examination of the specimen confirmed the diagnosis of thyroglossal cyst. No postoperative complications were seen. One patient had recurrence.

**Conclusion:** The most common presentation of thyroglossal cyst is a midline cystic swelling of the neck that moves up with tongue protrusion. Ultrasound scan is the most appropriate investigations. Sistrunks procedure is the treatment of choice.

**Key words:** Thyroglossal duct cyst, neck mass, congenital anomaly.

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## INTRODUCTION

Thyroglossal duct cyst is the commonest congenital neck mass in children<sup>1</sup>. This congenital malformation occurs due to incomplete closure of the thyroglossal duct. Towards the end of the third week of embryonic life thyroid gland appears as an epithelial proliferation in the floor of the primitive pharynx between the tuberculum impar and the cupula, at a point later indicated by the foramen cecum. This endodermal thickening soon becomes evaginated to form thyroglossal duct. This descends into the neck between the developing mandible (first arch) cranially and the hyoid bone (second and third arch) caudally. On reaching the front of the trachea the duct becomes bilobed to form the two thyroid lobes which are connected by the isthmus. By weeks 5 to 8 of gestation, the thyroglossal duct obliterates, leaving a proximal remnant, the foramen cecum, at the base of the tongue and a distal remnant, the pyramidal lobe of the thyroid. Thyroglossal tract passes down in front of the hyoid bone and then hooks up around its inferior border to lie posterior to the bone before

finally descending to the thyroid isthmus. Due to intimate relationship to the hyoid bone it is difficult to dissect the tract from its surface. The best way to remove all tract remnants is to excise the central part of the hyoid bone as recommended by sistrunk<sup>2</sup>.

Thyroglossal duct cyst is most often associated with young age although they may be found in patients of any age. More than half of the cysts are found before age of 10 years<sup>3</sup>. There is an equal male to female incidence<sup>4</sup>. The most common presentation is that of a painless cystic neck mass near the hyoid bone in the midline. The mass usually moves with swallowing and with protrusion of the tongue<sup>5</sup>.

Although these cysts are most commonly found just inferior to the hyoid (66%), they can be located between the tongue and hyoid (25%) and just over 10% are related to the thyroid. In 90% of cases the cysts are in the midline but in 10% these may be situated lateral to midline, usually on left side. Some patients present with acute infection and abscess formation. This may end in a draining fistula as a result of spontaneous rupture or surgical drainage<sup>4</sup>.

Ultrasound scanning is the investigation of choice which will confirm the diagnosis and will identify the presence of functioning thyroid in the neck. Thyroid function tests and / or a radioisotope scan may be performed if the patient is clinically

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hypothyroid or if no thyroid gland is seen on ultrasound scan<sup>6-7</sup>. A fine needle aspirate is needed to confirm the diagnosis if the mass is suprahyoid to help differentiate it from a dermoid cyst or submental lymph node.

Elective surgical excision is the treatment of choice for uncomplicated thyroglossal duct cysts to prevent infection of the cyst. The Sistrunk procedure is performed, rather than simple excision, to reduce recurrence risk<sup>8</sup>. Infected cysts or sinuses are managed first by treating the infection and once the infection clears the patient may undergo an elective Sistrunk procedure. Using the Sistrunk procedure recurrence is reported to be 2.6 to 5%<sup>9</sup>. Less than 1% have malignant tissue, usually well-differentiated thyroid carcinoma. Up to 90% of these are papillary carcinoma. This malignancy occurs most often in adults but has been reported in children. Treatment is with Sistrunk operation and thyroid suppression with thyroxin. Careful follow up is necessary<sup>8-10</sup>.

## PATIENTS AND METHODS

We treated 20 patients of thyroglossal duct cysts over a period of five years from January 2007 to December 2011. Patients with infected cysts or with systemic illness were excluded from the study. All these patients were admitted in ENT department and were evaluated in terms of detailed history, clinical examination and relevant investigations. Ultrasound scanning of the neck was performed in all patients to confirm the clinical diagnosis. Fine needle aspiration was performed in two patients with suprahyoid mass. Thyroid function tests and /or thyroid scan was not done. Sistrunk operation was performed in all cases which consisted of excision of thyroglossal duct, central portion of the hyoid bone and thyroglossal tract with a core of tongue muscles around it to just short of foramen cecum. This was done in order to remove all tract remnants and thus avoid recurrence. All specimens were sent for histopathological examination. Follow up was done at one, two, four weeks and six months interval for any complications and /or recurrence.

## RESULTS

This study included 20 patients constituting 12 male and 8 female (Male: Female 1.5:1). The age of the patients ranged from 5 to 11 years. The average age at diagnosis was 8 years. Eighteen patients (90%) presented with only midline cystic neck mass. In two patients (10%) the presentation was with a recurrent draining fistula in anterior part of the neck. In seventeen patients (85%) the mass and /or fistulous opening were located below the hyoid, in two patients

(10%) the mass was suprahyoid while in one patient (5%) it was found just above the thyroid gland. In nineteen patients (95%) the cyst and/or fistulous openings were found in the midline of the neck while in one patient (5%) the cyst was lying on the left side of the midline. Ultrasound examination of the neck was performed in all patients (100%) which clarified the nature and position of the mass and the presence of thyroid gland in the normal position. The cysts were found anechoic and well circumscribed on ultrasound. Fine needle aspiration performed in two patients (10%) with suprahyoid mass established the diagnosis of thyroglossal duct cyst. In all patients Sistrunk procedure was performed in which the cyst was removed along with the central portion of the hyoid bone with meticulous excision of persistent thyroglossal duct up to the foramen cecum. Prophylactic antibiotics were given to all patients for one week postoperatively. Clinicoradiological diagnosis was found in agreement with histopathological diagnosis of thyroglossal duct cyst in all of our patients. On follow up no post operative complications were seen. One patient had recurrence and was operated on six months later.

## DISCUSSION

Thyroglossal duct cyst is the most common midline paediatric neck mass<sup>1</sup>. Two thirds of thyroglossal duct anomalies are diagnosed within the first 3 decades of life, with more than half being identified before age 10 years. The average age in our study is 8 years (range 5-11 years) and we encountered no adult patient with thyroglossal cyst. Although male to female incidence of the cyst is reported to be equal, in our study males were affected more frequently compared to female<sup>4</sup>. Thyroglossal duct cysts are most commonly found immediately adjacent to the hyoid<sup>5</sup>. In our study seventeen patients (85%) had the cyst/ fistulous opening just below the hyoid bone, two patients (10%) had the cyst in supra hyoid position while one patient (5%) was having the cyst just above the thyroid gland in the midline. Deaver MJ et al also found the cyst inferior to the hyoid bone in majority of his patients (65%)<sup>4</sup>. Based on the study by Allard, (60%) of thyroglossal cyst were located adjacent to the hyoid bone, (24%) were between the hyoid and base of the tongue, (13%) were between the hyoid and pyramidal lobe of the thyroid gland and the remaining were within tongue or within thyroid<sup>12</sup>.

The most frequent presentation of thyroglossal cyst is a midline painless cystic neck mass that moves with swallowing and protrusion of the tongue. We observed this classical presentation in seventeen patients (85%), in one patient (5%) the cyst was to the left side. Recurrent draining fistula located in the

midline below the hyoid was found in two patients (10%) which was the result of spontaneous drainage of infected cyst. These findings were in agreement with various studies in the literature<sup>1,3</sup>.

Though the diagnosis is mainly clinical, ultrasound scanning is of great help to confirm the diagnosis and clarify the nature of the cyst. Normal thyroid tissue has to be identified by ultrasound before surgery to prevent postoperative hypothyroidism<sup>6,13</sup>. We subjected all of our patients to ultrasound study which demonstrated an anechoic well circumscribed cyst in all cases (100%). Thyroid profile and radioisotope thyroid scan were not performed as the ultrasound clearly identified the presence of normal thyroid gland in the neck. Fine needle aspiration may be needed to confirm the diagnosis if the mass is supra hyoid to help differentiate it from a dermoid cyst and/ or sub mental lymph node<sup>14</sup>. This was done in two patients (10%) with the mass in supra hyoid location.

Earlier, thyroglossal duct cyst was treated with simple excision which resulted in a high recurrence rate of 38% to 70% in patients. In 1893, Schlange proposed the excision of the cyst along with the central portion of the hyoid bone, which reduced the recurrence rate to 20%<sup>15</sup>.

Treatment of choice now is Sistrunk operation. This consists of excision of thyroglossal, cyst, central portion of the hyoid bone and thyroglossal tract with a core of tongue muscles to just short of foramen cecum. This has brought down the recurrence to 3.6 to 5%<sup>16,17</sup>. We encountered recurrence after Sistrunk procedure in one patient (5%) which is agreement with that of the other studies<sup>13-14</sup>.

The histologic appearance of a thyroglossal cyst is a cyst lined by respiratory epithelium with thyroid tissue, mucous glands, and small patches of lymphoid tissue variably present in the connective tissue wall. The presence of thyroid tissue in the wall of the cyst is considered pathognomonic of thyroglossal cyst. According to the literature review thyroid tissue has been observed histologically in 46% of cases of excised thyroglossal cysts<sup>18</sup>. In all of our cases the histopathology reports supported the diagnosis of thyroglossal cyst. The incidence of carcinoma of thyroglossal duct cyst is less than 1% which occurs more often in adults but has been reported in children as young as 6 years old. Up to 90% of these are papillary. Treatment is with Sistrunk operation and thyroid suppression with thyroxine<sup>8,10</sup>. Histologically all our cases were reported benign.

## CONCLUSION

The diagnosis of thyroglossal duct cyst in most of the cases is clinical. The most common presentation is a

midline cystic swelling of the neck that moves up with protrusion of the tongue. Ultrasound scanning is the investigation of choice to confirm the clinical diagnosis and to avoid inadvertent excision of an ectopic thyroid gland. Sistrunk procedure is the best management policy.

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