

A Clinical Study on Thyroglossal Duct Cyst

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Abstract: Objective: To study clinical presentation and surgical findings of thyroglossal duct cyst.

Study design: Retrospective study.

Setting: Department of ENT, Burdwan Medical College & Hospital, Burdwan

Materials and Methods : 30 patients of histopathologically confirmed thyroglossal cysts were enrolled in the study who presented with neck swelling in the Department of ENT, Burdwan Medical College & Hospital, Burdwan from March 2017 and February 2019.

Results: Mean age of presentation was 10 years. Majority of the patients (80%) were less than 15 years of age. Male:Female=8:2. Ninety percent (90%) of patients presented with neck swelling and subhyoid in location (85%). Erythema/redness over swelling was seen in 15% of patients. Majority (83.3%) were cysts. Thyroglossal ducts were found to be patent for different lengths and areas. Majority of patients (86.7%) had tract coming up from cyst and disappearing at superior border of hyoid body while three patients (10%) had patent thyroglossal duct from cyst to vallecular mucosa. A complete patent thyroglossal duct was seen in one patient (3.3%) from cyst to base of tongue. completely absent tract was seen in two patients (6.7%). Majority (70%) of cysts were having size between 1.5 to 3 cm.

Conclusion : Thyroglossal cysts are most commonly seen in pediatric males. Most of them present with visible midline neck swelling. In few cases cyst can rupture after repeated infections leading to fistula formation. Most of them are subhyoid in location. These cysts are usually of size 1.5-3 cm. Patent thyroglossal duct, in complete from cyst to tongue musculature is rarely seen while most of the times, a patent duct just disappears at the superior border of body of hyoid. None of our cysts had malignant features.

Keywords: Hyoid bone; Thyroglossal duct cyst; Thyroglossal fistula

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I. INTRODUCTION

Thyroglossal duct cysts (TGDCs) are the most common congenital midline cervical anomalies in children and account for approximately 70% of all congenital neck lesions [1]. The differential diagnosis of a midline mass in the neck mass in a child includes TGDC, dermoid, lymph node, lipoma, hemangioma, ranula, and inflammatory lesion. Thyroglossal duct runs from the foramen caecum at the junction between the anterior two-thirds and posterior third of the tongue to the anatomical resting place of the thyroid. It usually involute after the 5th embryonal week [2]. Failure to involute and atrophy leading to persistence of a thyroglossal duct remnant or cyst, which is usually found at the level of the hyoid bone. A thyroglossal cyst may form at any point along the duct [2].

The classic presentation is a midline, non tender, palpable mass that moves with swallowing and elevates on protrusion of the tongue. Thyroglossal duct cysts are usually 2–4 cm in diameter and gradually increase in size [3]. They may enlarge rapidly after an upper respiratory tract infection.

TGDCs tend to present in childhood as a painless midline mass just inferior to the hyoid at the level of the thyrohyoid membrane (65%). Other locations include the suprahyoid location in up to 20% to 25% of the cases and at the level of the hyoid in 15% to 50% of the cases [4]. TGDCs usually occur in equal frequencies in males and females [5].

Thyroglossal duct cysts (TDCs) often occur in pediatric patients, however, at least half are found in the second decade of life and they can also present later in adulthood [6]. Majority is benign, but 1% may be malignant [7]. Possible complications are inflammation, rupture and recurrence. The TDC which ruptures spontaneously manifests as a draining sinus, which is being erringly called a thyroglossal fistula.

Investigations for the detection of TDC include USG neck, which shows a cystic lesion [8]. Treatment consists of Sistrunk's procedures which include removal of cyst along with a tract, body of hyoid bone and core

of tissue along tract up to the foramen caecum [9]. Recurrence rates with Sistrunk's procedure, when properly performed, are less than 3%, and usually present within one year following excision [9].

II. MATERIALS AND METHODS

This is a retrospective study which was done in the Department of ENT, Burdwan Medical College & Hospital, Burdwan from March 2017 and February 2019. Thirty patients with thyroglossal cyst were enrolled in this study. Patients were initially diagnosed on the basis of clinical history, examination, FNAC findings and USG findings suggestive of cyst. All patients were taken up for a modified Sistrunk's operation where cyst along with body of hyoid and tract (whatsoever length present) was removed. Cuff of tissue of base of tongue was removed only if tract was seen attaching it. Clinical and surgical data in terms of size, location of cyst and presence or absence of thyroglossal duct etc. was analyzed and formulated in tables for patients who had histopathologically confirmed cyst in the study.

III. OBSERVATION

Major of the patients (60%) were less than 10 years of age (Table 1). TGDCs usually occur in equal frequencies in males and females. (Chart 1). Eighty six percent of patients in our study presented with painless neck swelling. Erythema/redness over swelling with pain were seen in 13.3% of patients. Movement with swallowing and with protrusion of tongue was seen in 100% of patients. (Table 2). All the TGDCs were midline but their longitudinal location were different. Majority (86.67%) of cysts were located at subhyoid region, followed by suprahyoid in 10% and overhyoid in 3.33%. (Table 3).

Thyroglossal duct tract were seen to be patent for different lengths. Majority (86.67%) had tract arising from cyst and becoming lost at superior border of hyoid body while 1(3.33) patient had an obvious complete thyroglossal duct tract from cyst to base of tongue and 2 patients (6.67%) had patent thyroglossal duct from cyst to vallecular mucosa. Complete absent tract (cyst with body of hyoid) was seen in one patient (3.33%). The patent tract went under, at superior border of hyoid body in 26 patients (86.6%)(Fig. 1) while in 3 patients each the patent duct went over the hyoid bone, after hooking under the hyoid bone. (Table 3, Fig. 2).

The size of TGDCs varied in our study. Majority (80%) of TGDCs were having size between 2 and 4 cm followed by 16.6% in size range 0–2 cm. Only one(3.33) cyst was seen with size greater than 4 cm. Most of the cysts (66.7%) were firm on palpation while 10% were soft cysts. (Table 4). We did not found any patient having concomitant malignancy.

IV. DISCUSSION

The primordium of the thyroid gland is combined with the tongue by a narrow tubular structure called the thyroglossal duct. The thyroglossal duct usually atrophies and disappears during the eighth and tenth weeks of gestation. Failure to involute and atrophy results in persistence of a thyroglossal duct as a fibrous cord or as a minute epithelial tube [0] or if the duct persists, regarding repeated local infection or inflammation, secretion from the epithelial lining may accumulate, triggering Thyroglossal cyst formation [11]. Thyroglossal duct cysts (TGDCs) are the most common congenital lesion in the neck.

The mean age of clinical presentation in our cases was 10 years. This is similar to a study by Kepertis et al.[12] who found the mean age of the 33 patients with TDC at the time of surgery as 6.125 years. In contrast, in other studies the mean age was quite high as compared to our study. The mean age was 16.7 and 21 years in a study by Asmat et al.[13] and Ubayasiri et al. [14] respectively. There were 22 boys (73.3%) and 8 girls (26.7%) in our study, which shows male predominance. This male predominance is in accordance with literature [12].

It is clear from our and other studies that Thyroglossal duct cysts (TDCs) are more common in pediatric patients followed by patients in their second decade of life. The probable reason being the thinning of adipose tissue during this period of childhood. It is rare in the elderly patients with a reported incidence of approximately 0.6% in the 6th decade [15].

It is expected that most of these patients are asymptomatic but in contrary all of our patients were symptomatic. Ninety percent of our patients presented with painless neck swelling. Moorthy et al. [16] in their study found typical painless swelling only in about 41.6% of the patients diagnosed of TGDC while one more study by Kepertis et al. [12] found 63.6% had palpable midline cystic mass.

Erythema/redness over swelling was seen in 13.3% of our patients and same had Tenderness. Painful swelling and deglutination was seen in 13.3% of patients at presentation while 10% presented with only recurrent discharge from midline neck. Kepertis et al.¹² in their study found (24.2%) with typical glairy discharge and (12.12%) with serious cervical infection at the midline requiring preoperative drainage and antimicrobial therapy.

Because of its relationship to both the hyoid bone and foramen caecum, the cyst typically moves cranially with swallowing and protrusion of the tongue. These manoeuvres may be difficult to elicit in small children. We found movement with protrusion of tongue and with swallowing in 100% of patients.

Thyroglossal duct cysts have been seen to be located at different sites. We found majority (83.3%) of cysts were subhyoid in location followed by suprahyoid in 10% and suprasternal and overhyoid in 3.35%. Most of the cysts (9.7%) were midline while one was seen towards left side. This predominance of subhyoid location has been reported in studies of Ali et al [10]. Although we did not find any rare location of cyst but rare locations have been reported in literature like suprasternal [10], lingual (foramen caecum) [17], *mediastinum* [16], *intrahyoid* [16].

We tried to see on naked eye the remnants and patent thyroglossal ducts at the time of surgical exploration and we found some interesting results. We found that thyroglossal duct was patent for different lengths and areas in different patients. In majority of patients (80%) a duct was seen coming out of thyroglossal cyst and disappearing at superior border of body of hyoid while 3 patients (10%) had patent thyroglossal duct from cyst to vallecular mucosa. A complete patent thyroglossal duct was seen in one patient (3.3%) from cyst and entering base of tongue. Complete Absent tract was seen in two patients (6.7%). In our study patent duct went under the hyoid body in 26 patients (86.6%) while in two patients each the patent duct went either through or over the hyoid bone. In contrary one article mentions that when main duct is found it has a position anterior to the hyoid in 72% of cases and posterior to the hyoid in 28% of cases. From our surgical naked eye observation we conclude that complete patent thyroglossal duct is rarely seen and surgeon should remember this fact while operating a patient of thyroglossal duct cyst.

Removing hyoid body is necessary to significantly reduce recurrence. Using classical Sistrunk's technique, Marshall and Becker [2] described a recurrence rate of just 1.3% in their series of 310 cases.

Nevertheless, the current published data give a recurrence rate of over 4%¹⁹ because nowadays a modified Sistrunk's operation is done where coring out suprahyoid tissue up to base of tongue is not done. Instead, it is common practice to simply follow the tract above the hyoid until it breaks off or disappears. As a result surgeon can leave tissue that could contain remnant ducts or branches that are not visible to naked eye and so there are bit higher chances of recurrence.

In light of our observation in majority of cases, removal of cyst with hyoid bone and thyroglossal duct up to superior body of hyoid is sufficient. We personally did not find any recurrence so far with this procedure but at the same time we believe classical Sistrunk's operation is still the procedure with least recurrence. Some authors do claim that central neck dissection [14] in addition to removal of hyoid body decreases the recurrence to about zero but this is yet to be universally accepted.

Thyroglossal duct cysts are usually 2–4 cm in diameter and gradually increase in size as per one standard textbook [3] and we are also of same opinion as Majority (70%) of cysts were having size between 1.6 and 3 cm followed by 16.6% in size range 0–1.5 cm [18]. We did not encounter any giant thyroglossal cyst but there are reports of giant cysts in literature [20]. Most of the cysts (66.7%) were firm on palpation while 10% were soft cysts.

Intraoperatively three (10%) of our cysts got ruptured while in a series by Ubayasiri et al. [14] 19% got ruptured. We did not encounter malignant change in any of our patients. It is estimated that only about 1% of the patients with TDC show malignant changes, the most common being papillary thyroid carcinoma[16].

V. CONCLUSION

Thyroglossal duct cyst is the most common congenital cervical anomaly. There is maximum clustering of cases in pediatric males. Most of them present with visible midline neck swelling which moves with deglutination and swallowing. In few cases cyst can rupture after repeated infections leading to sinus formation. Most of them are subhyoid in location. These cysts are usually of size 1.5–3 cm.

Complete patent duct from cyst to tongue musculature is rarely seen while most of the times, a patent duct just disappears at the superior border of body of hyoid. These cysts can rupture on surgical exploration. None of our cysts had malignant features.

VI. TABLES

Table 1: Age distribution

Age	Number of cases	Percentage (%)
0-10	18	60
11-20	05	16.67
21-30	05	16.67
31-40	02	6.67
>40	00	00
Total	30	100

Chart – 1: Gender Distribution

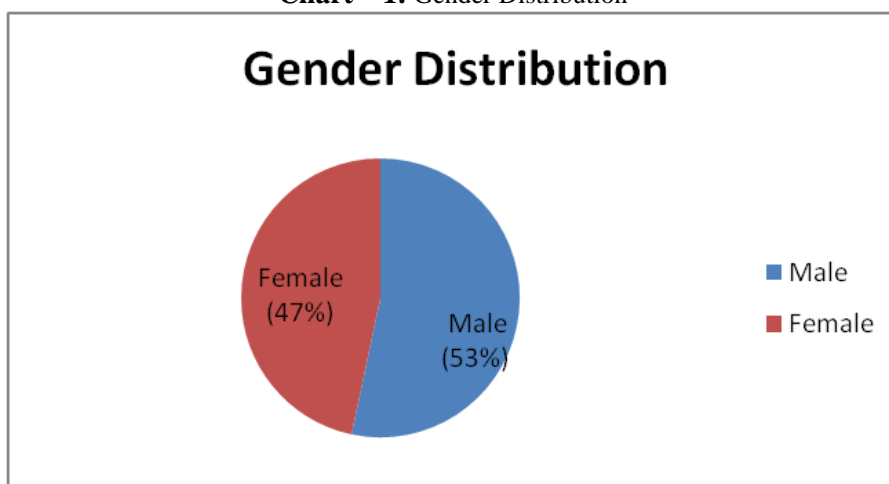


Table – 2: Clinical presentation

Symptoms/Signs	No of cases	Percentage (%)
Painful neck swelling	26	86.67 %
Erythema/redness	4	13.3 %
Painful swelling	4	13.3 %
Movement with protrusion of tongue	30	100 %
Movement with digglutition	30	100 %

Table – 3: Extent and course of the Thyroglossal Duct

Extent of the tract :	No of Patients	Percentage (%)
From cyst to base of tongue	1	3.3 %
Fron cyst to vallecular mucosa	2	6.67 %
Absent tract	1	3.33 %
From cyst to superior border of hyoid	26	86.67 %
Course :		
Going under the hyoid	26	86.6 %
Going over the hyoid	3	10 %

Table – 4: Size and consistency of the Thyroglossal Duct

Size of the cyst :	No of Patients	Percentage (%)
0 – 2 cm	5	16.6 %
2.1 – 4 cm	21	70 %
>4 cm	1	3.4 %
Consistency :		
Cystic	10	33.3 %
Firm	20	66.7 %

Fig-1: Surgical steps of TGDC with patent tract went under, at superior border of hyoid body.



Subhyoid tgdc



Upper & lower flap elevated.

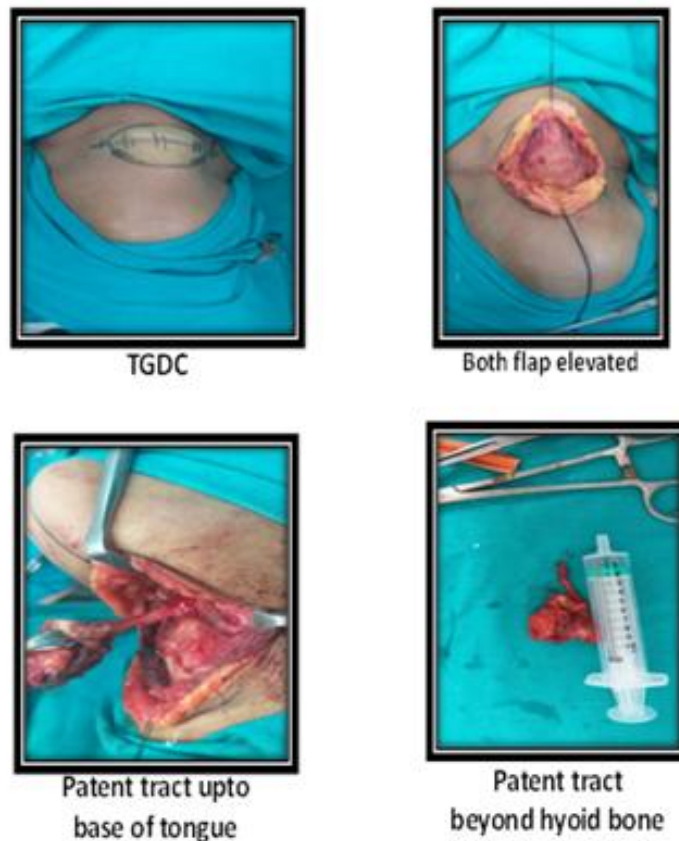


Subhyoid tgdc dissected out.



Dissected tgdc with part of hyoid body.

Fig-2: Surgical steps of TGDC with patent duct went over the hyoid bone (upto base of tongue).



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