Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/5y00xj48

CLINICAL OBSERVATION OF THYROGLOSSAL DUCT CYST

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Abstract
Remnants of the embryonic thyroglossal duct can occur anywhere from the base of the tongue to the thyroid gland and present as thyroglossal cysts, the most common congenital anomaly of the neck. These cysts are midline swellings of the neck that move with swallowing and tongue protrusion.
This article presents 10 cases of thyroglossal duct cysts (TDC) seen in the ENT Department at Saraswathi Institute of Medical Sciences (SIMS), Anwarpur, Hapur. Here, we discuss their different presentations and diagnostic approaches.
Study design: Prospective clinical study of patients presented in the ENT department, both outpatients and inpatients. Their clinical presentation, examination, radiological investigations, FNAC, and histopathological examination (HPE) reports and their correlations were analyzed.
Results: Ten cases of TDC treated in the ENT department are described here.
Conclusions: This study shows variations of TDC with respect to age, anatomical site, and associated signs and symptoms.

Keywords: Thyroglossal duct, FNAC, Histopathological examination

Introduction

The thyroglossal duct cyst (TDC) is a frequently occurring birth defect affecting the neck. Distinguishing it from other cysts such as branchial cysts, lymphangiomas, epidermoid cysts, dermoid cysts, and hydatid cysts can be challenging. This institutional study examines 10 cases with thyroglossal duct cysts to evaluate the clinical presentation, treatment, and outlook of the condition. Among these cases, 6 (60%) were male and 4 (40%) were female. Most of them were children. Every patient experienced a previous occurrence of a painless enlargement in the front center of the neck that shifted as they swallowed or protruded their tongue. Recurrence after surgical removal was uncommon, and our investigation did not observe any instances of recurrence. While this congenital

defect is typically detected in children at an early age, there have also been cases where young adults presented with TDC [1,2,3]. The majority of thyroglossal cysts manifest as a painless fluid-filled tumor located around the hyoid bone. The TDC typically manifests as a movable, painless, non-lobulated swelling in the neck that shifts when swallowing or protruding the tongue.

Untreated thyroglossal duct cysts (TDC) can result in several issues. Initially, approximately 5% of these cysts manifest as an acute inflammatory event, either with or without an infection. The first reason is that the thyroglossal duct cyst might grow in size and potentially rupture, leading to the formation of a thyroglossal fistula in 15% of cases [4]. Furthermore, it is worth noting that in exceptional instances, residual thyroid tissue may be found within a cyst and can develop into a tumor [5]. There is an equal distribution of sexes. The average age of onset is five years, with a range spanning from four months to advanced age. Ninety percent of the cases are located in the midline, but 10 percent may be found on either side, with 95 percent of these cases being specifically on the left side. Seventy-five percent of them are positioned pre-hyoid, while the remaining 25 percent are situated either above or below the hyoid bone. Occasionally, they can also be detected within the mediastinum [6]. In certain documented instances, it may manifest on the floor of the mouth or in the sublingual area, leading to potential confusion with ranula, dermoid, and cystic hygromas. Imaging and FNAC are crucial in making a diagnosis [7]. The therapy of choice is Sistrunk's procedure.

Materials & Methods

The research was conducted in the Department of Otorhinolaryngology (ENT) for a two-year period, commencing on January 1, 2022, and concluding on May 1, 2024. In Greater Noida, India, the Department of Otorhinolaryngology at the Saraswati Institute of Medical Sciences (SIMS) treated 10 patients who were diagnosed with thyroglossal cysts during this period. The hospital's ethics committee granted ethical approval for the investigation. The patients in our investigation ranged in age from one year to forty years. Thirty percent of the total number of cases (3 instances) were attributed to individuals aged one to ten. Four out of eleven to twenty years is equivalent to forty percent. Two individuals, which account for 20% of the total, were between the ages of 21 and 30. Furthermore, there was one individual, who was between the ages of 31 and 40, and accounted for 10% of the total. From a total of 10 cases, 6 (60%) were male and 4 (40%) were female, calculated according to gender. Swelling was observed in 30% of patients above the hyoid bone and in 60% of patients immediately below the hyoid bone, as indicated by their anatomical locations. Furthermore, 10% of the patients experienced edema between the hyoid bone and sternum.

In clinical terms, patients present with midline neck swellings that have been present since birth, which progressively enlarge and are non-painful. A midline cystic neck enlargement was observed during the local examination. After swallowing and protruding the tongue, it was non-tender and moved vertically. Nevertheless, it did not migrate laterally. The diagnosis was determined through a combination of clinical examination, ultrasonography, fine needle aspiration cytology, and histopathological examination (Figure 1 and Figure 2). The thyroid hormone profile, systemic examination, and investigations did not reveal any abnormalities. The Sistrunk surgery was performed on all six individuals, which constitutes 60% of the sample. None of these patients experienced a recurrence of their condition. Out of the total cases, four (40%) were treated exclusively through the Shalang operation, which involved surgically removing the lesion.

Figure 1: Suprasternal Thyroglossal Cyst Showing Cystic Wall, Epithelial Lining, and Surrounding Stroma at 4x Magnification

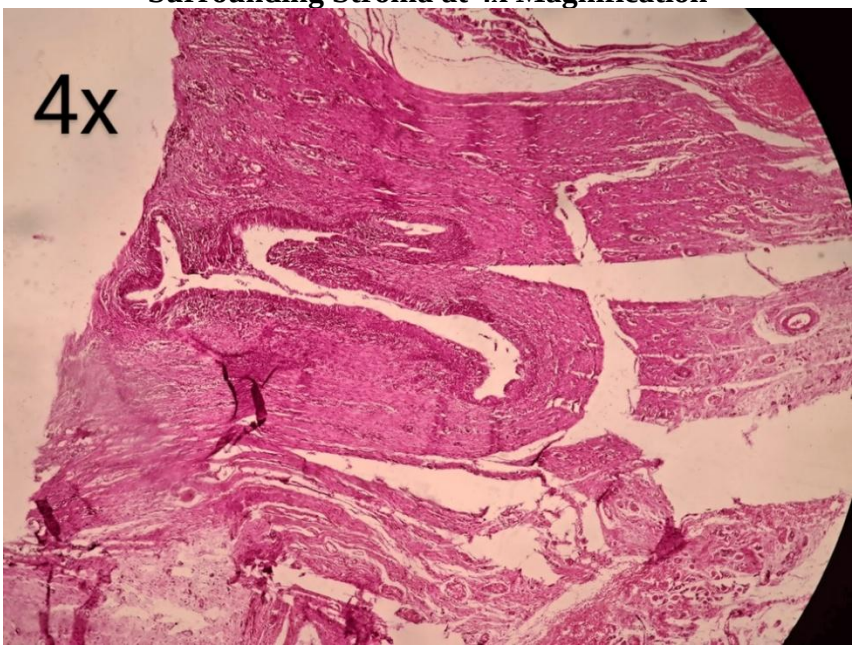
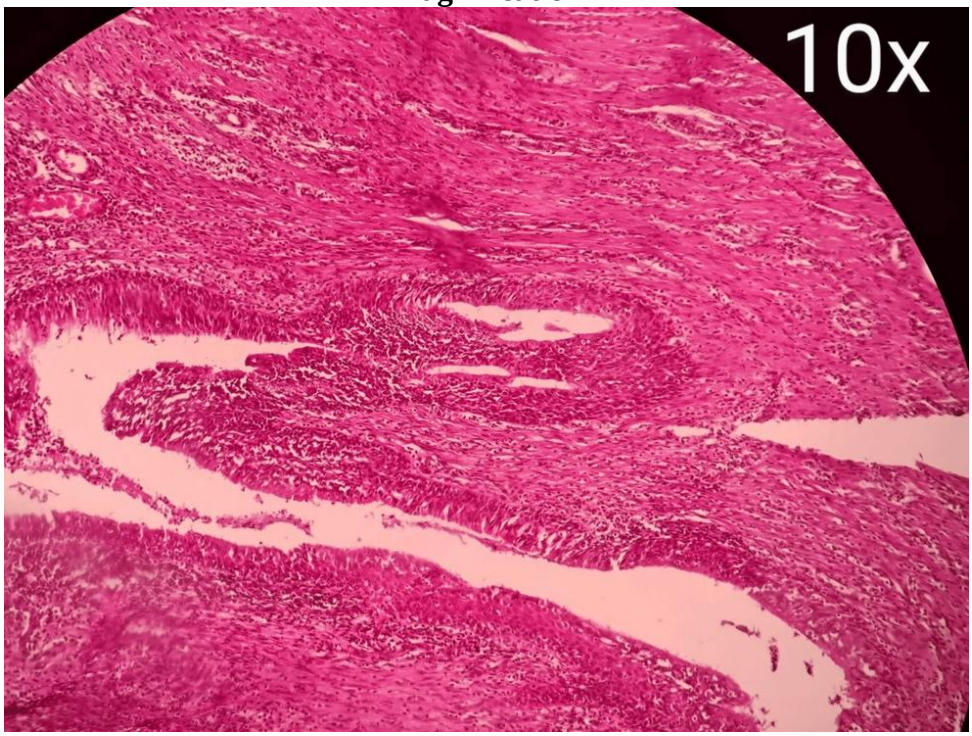


Figure 2: Supra-Hyoid Thyroglossal Cyst Showing Cyst Wall and Lymphoid Tissue at 10x Magnification



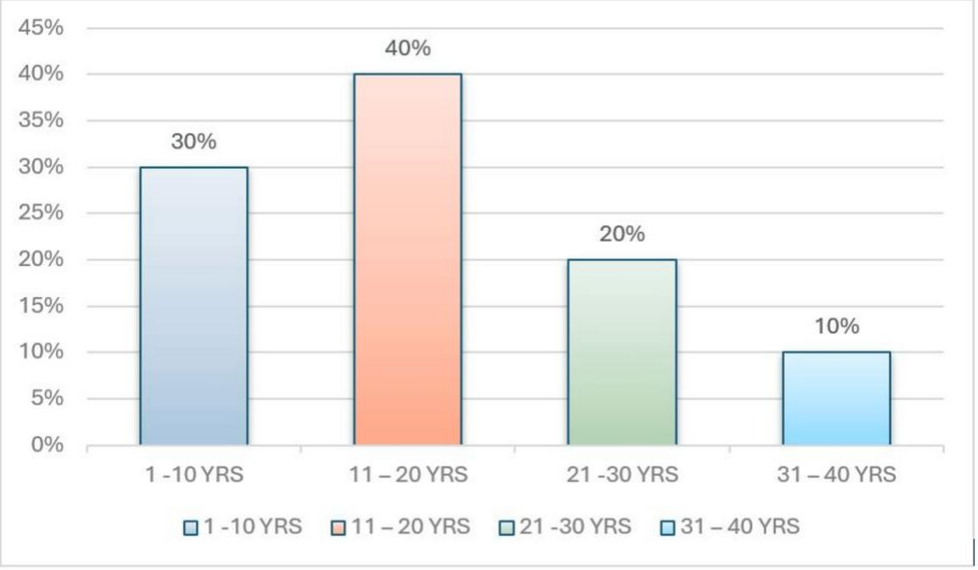
Results

The present study was conducted in the Department of ENT for a duration of three years from January 1, 2021, to March 1, 2024. During this period, ten cases of thyroglossal duct cysts were admitted to the Department of ENT. The results and observations are presented according to the following tables and charts. Table 1 and Figure 3 summarizes the age distribution in this study.

Table 1: Age Distribution

	NO. OF CASES	PERCENTAGE
1 -10 YRS	3	30%
11 – 20 YRS	4	40%
21 -30 YRS	2	20%
31 – 40 YRS	1	10%

Figure 3: Graphical Representation of Age Distribution

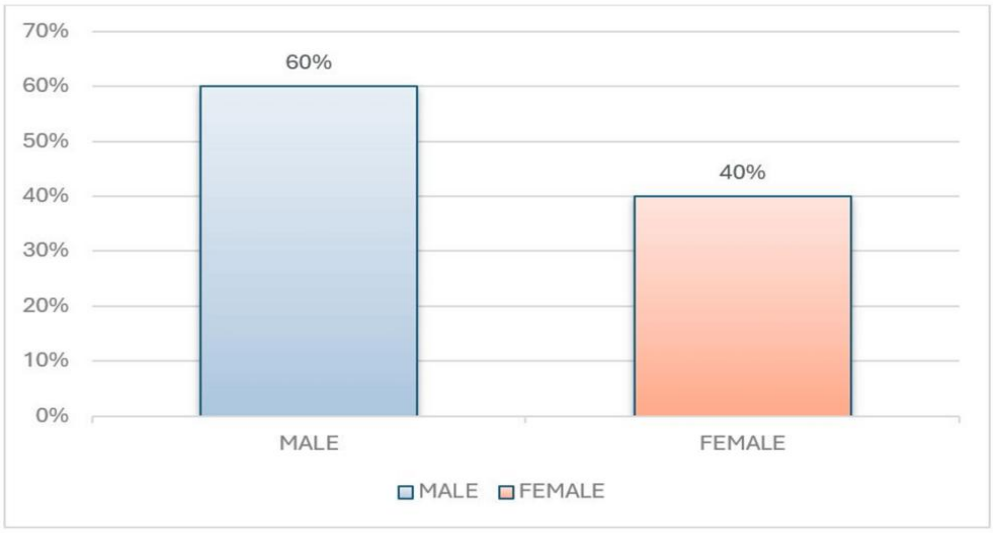


The second decade (ages 10-19) is the most prevalent age group in the current study, followed by the first decade (ages 0-9). The youngest patient was six years old, while the oldest was 35 years old. The incidence was more common in males, with 6 patients (60%). Table *2* and Figure *4* illustrate the distribution based on gender.

Table 2: Sex Distribution

	NO. OF CASES	**PERCENTAGE**
MALE	6	60%
FEMALE	4	40%

Figure 4: Graphical Representation of Gender Distribution



The subhyoid location was most common, occurring in 6 patients (60%). Table *3* and Figure *5* illustrate the location of thyroglossal cysts based on the location of the hyoid bone.

Table 3: Location of Thyroglossal Cyst in Relation to the Hyoid Bone

	NO. OF CASES	PERCENTAGE
SUBHYOID	6	60%
SUPRAHYOID	3	30%
SUPRASTERNAL	1	10%

Figure 5: Graphical Representation of the Location of Thyroglossal Cyst in Relation to the Hyoid Bone

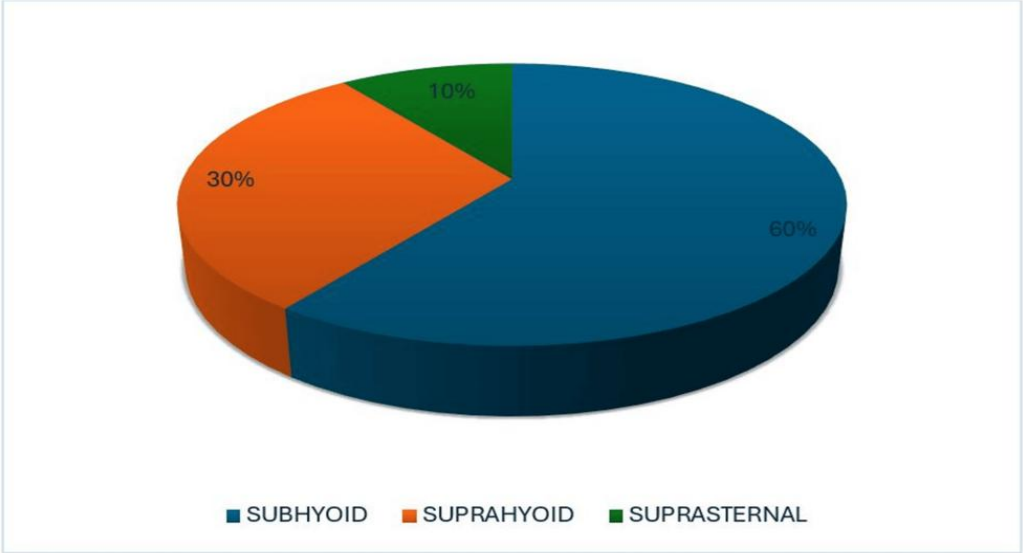
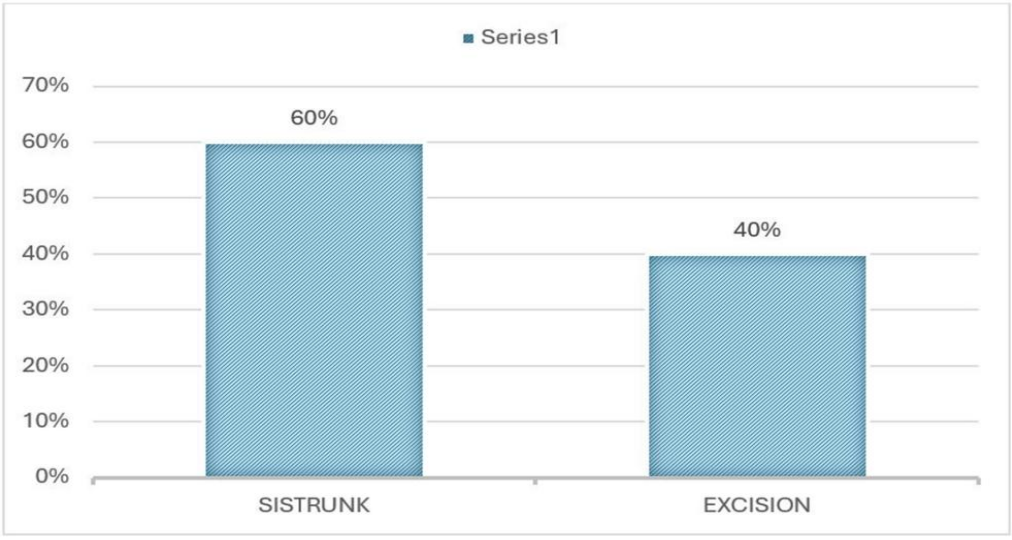


Table 4 and Figure 6 illustrate that sistrunk approach was most commonly used to treat thyroglossal cyst.

Table 4: Mode of Treatment

TYPE OF WOUND	NO. OF CASES	PERCENTAGE
SISTRUNK	6	60%
EXCISION	4	40%

Figure 6: Graphical Representation of Mode of Treatment



Discussion

A thyroglossal cyst is the most common anterior congenital midline neck swelling [8]. The thyroid gland originates from the lower portion of the early pharynx, specifically between the first and second pharyngeal pouches. By the seventh week of gestation, the thyroid gland has typically migrated to its usual position. It extends downward through the thyroglossal duct and is situated beneath the thyroid cartilage. When epithelial cells do not become quiescent, they develop into thyroglossal duct cysts. If the stalk does not degenerate by the sixth week, it will persist as a patent tract, which may subsequently develop into a thyroglossal duct, where cysts can form. The tract may extend from the thyroid gland in a downward or upward direction, as well as in the vicinity of the hyoid bone. It may be situated in front of, behind, or through the bone at this location. It concludes at the foramen cecum region of the tongue, which is the junction between the anterior two-thirds and the posterior third of the tongue [9].

Thyroglossal cysts are typically diagnosed in children; however, young adults may also present with a primary cyst that requires surgical intervention [10]. The clinical presentation is characterized by a movable cystic enlargement in the center of the front of the neck that is non-painful. This enlargement is typically situated in close proximity to the hyoid bone and is most noticeable when the tongue is protruded or swallowed [11]. Cystic growths may occasionally rupture and become infected, leading to the formation of a fistula.s

Surgical excision is the treatment of choice [12]. The Sistrunk technique was initially documented in 1920. Previously, the hyoid bone was not removed, resulting in a substantial number of recurring cases associated with infections. A frequently employed procedure is a modified variant of the Sistrunk approach, which does not require the removal of the epithelium from the base of the tongue [13]. The cyst is excised through a horizontal midline neck incision positioned directly beneath it. The infrahyoid strap muscles and the laryngeal cartilages are surgically excised to eliminate the thyroglossal duct cyst. The dissection then proceeds to the hyoid bone region. The hyoid bone is now separated from the suprahyoid muscles, which include the mylohyoid, geniohyoid, and genioglossus muscles. Additionally, the middle third of the hyoid bone, located between the lesser cornua, is severed and removed along with the soft tissue specimen of the adjacent area. The thyroglossal duct cyst is included in this specimen. The surgical procedure involves the removal of a core of tissue by dissecting upwards, specifically into the base of the tongue. This tissue should include a tract or raphe between the mylohyoid muscles, a portion of each genioglossus muscle, and extend to the foramen cecum. In contrast to the Shalang operation, which involves simple excision or removal of the cyst, the utilization of this technique has led to a significant reduction in the rate of cyst recurrence [14].

Conclusions

This study demonstrates the variability of thyroglossal duct cysts (TDC) in relation to age, anatomical location, and the presence of accompanying signs and symptoms. A thyroglossal duct cyst is a painless swelling that occurs in the center of the neck. These cysts result from a failure to completely eliminate the embryonic duct during the migration of the thyroid. The recommended surgical procedure is the Sistrunk operation, which has a low rate of recurrence.

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