

Sistrunk's operation: ten years' experience in a teaching hospital.

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ABSTRACT

Introduction: Thyroglossal duct cyst (TGDC) is a congenital condition that results from persistence of thyroglossal duct. It commonly presents in the midline neck as a painless nodule. On physical examination, it moves with protrusion of tongue and on swallowing. Meticulous clinical history and physical examination are sufficient to make a correct preoperative diagnosis. Ultrasonography of the neck and fine needle aspiration cytology are other useful tools in the diagnosis. Although a congenital anomaly, it usually presents in the first and second decades of life. The standard treatment of choice for thyroglossal duct cyst is Sistrunk's operation. The aims of this study are to identify the age of presentation of patients with thyroglossal cyst, its site of occurrence in relation to hyoid bone and to look for the patterns of recurrence after Sistrunk's operation.

Methods: This is a retrospective study with 34 patients over a period of ten years operated by a single surgeon. Patients treated by Sistrunk's operation and confirmed as the thyroglossal duct after histopathology report were included in the study. Their demographic data, age at presentation, surgical treatment and recurrence rate were noted and analysis were made.

Results: There was slight male predominance, majority of the thyroglossal cysts were found in the pediatric population and below the hyoid bone, and there were acceptable recurrences.

Conclusions: Thyroglossal duct cyst is a disease of children. Sistrunk's operation is the standard surgical procedure with minimal recurrence.

Key words: *Position; Recurrence; Sistrunk's operation; Thyroglossal cyst*

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INTRODUCTION

Thyroglossal duct cyst (TDC) is a congenital condition that results due to persistent thyroglossal duct. It is a very common differential diagnosis of midline neck swelling in children. [1] Although location of a thyroglossal duct cyst can vary ranging from intraoral to suprahyoid and infrahyoid, most of them present as painless nodules inferior to the hyoid bone in the neck. [2] Other symptoms like dysphagia and hoarseness are rare and occur when the cyst gets infected. [3] There are reports of papillary carcinoma thyroid developing within the cyst as well. [4]

On physical examination, thyroglossal duct cyst moves both with protrusion of tongue (due to its connection to the base of tongue) and on swallowing. This is the most characteristic clinical feature to differentiate from other neck swellings. In most circumstances a meticulous clinical history and physical examination are sufficient to make a correct preoperative diagnosis. Ultrasonography of the neck and fine needle aspiration cytology are the other useful tools in the diagnosis. Although a congenital anomaly, thyroglossal cyst usually presents later in life. A bimodal age distribution of TDC has been observed, with a peak between the ages of 6–13 years and at ≥ 19 years. [5]

The standard treatment of choice for thyroglossal duct cyst is Sistrunk's operation. [6,7] This operation entails excision of the mid-portion of the hyoid bone with the cystic portion, as well as excision of the thyroglossal duct between the foramen cecum at the tongue base and the hyoid bone to prevent cyst recurrence. [8] Simple excision of the cyst is associated with high rates of recurrence. [9] In this study, we have elaborated our experience on thyroglossal duct cyst according to the age of presentation, common site of presentation in relation to the hyoid bone and outcome of Sistrunk's operation in our institution. We hope that this study will enlighten our standards of treatment in thyroglossal duct cyst regarding identification of the age of presentation of patients with thyroglossal cyst, the site of occurrence of thyroglossal cyst in relation to hyoid bone and the patterns of recurrence after Sistrunk's operation

METHODS

This is a retrospective study carried out in the Department of ENT and Head and neck surgery at Manipal College of Medical sciences, Pokhara, Nepal. Diagnosis of thyroglossal duct cyst was made by clinical findings, ultrasonography of the neck and fine needle aspiration cytology (FNAC). Patients of all age and both sex of confirmed thyroglossal duct cyst undergoing Sistrunk's operation by the principal author over a period of 10 years (2008-01-01 to 2017-12-31) were included in the study. All specimens which were proven to be consistent with TGDC in histopathology were finally included in the study. Samples were taken from hospital in-patient files and the principal author's record of surgery and follow up. Patients were contacted over the telephone for their post-operative status and were asked to follow up if possible. Patients who

had come for follow up of at least 1 year after surgery were included in the study. Revision surgery and thyroglossal fistula were excluded from the study. Ethical clearance was taken from the Institutional Review Committee. Data were taken and analyzed in terms of age of presentation, site of occurrence and recurrence of the cyst and the results were published.

RESULTS

Forty-three patients of thyroglossal duct cyst were excised by Sistrunk's operation for a period of ten years by the author. All the patients underwent the same standard procedure without biasness. Out of them nine patients could not be contacted. Therefore, only thirty-four patients were enrolled for final analysis.

There were 18 male and 16 female patients in our study with male to female ratio of 1.12:1 (Fig.1). The youngest patient was of 4 years and the eldest was 56 years with the mean age of 19.76 years. Most of the patients were of less than 10 years (12) followed by 10 to 19 years (10). There were only 12 patients above 20 years. Patients below 20 years represented about two thirds (64.7%) of the total patients in our study. Figure 2 shows the number of patients according to age. There was statistical significance in the age ranges (two-tailed P value 0.0021) according to one sample t test).

Thyroglossal duct cyst location was also noted. Infrahyoid location was found in 29 patients (85.2%) and suprahyoid location was found in 5 patients (14.8%). However, there was no statistically significant difference between the two sites (two tailed p value=0.39).

There was variable duration from occurrence of the cyst to the presentation to hospital. Fifty percent (17) of the patients presented within 1 year of occurrence of the neck swelling, 7 of them presented in their second year of occurrence, 5 of them presented after 2 to 10 years and rest 5 presented after 10 years. Average duration from the occurrence of cyst to presentation to the hospital was 4.16 years. The maximum delay was 30 years after the occurrence of cyst (Table 1).

Occurrence of cyst	Number of patients
0-1 years	17
1.1-2 years	7
2 -5 years	5
>10 yrs	5

Table 1. Duration from occurrence of the cyst to the presentation to hospital.

There was also variability in the size of the cyst. Fifty percent of the cysts were small and less than 20 mm in their greatest dimension in ultrasonography (17 out of 34), thirteen of them ranged from 20 to 29 mms in their greatest dimensions whereas 4 of them were ranging from 30 to 39 mms in their greatest dimension. None of the cysts were more than 40 mms in size (Table 2).

Size of the cyst	Number of patients
1-19 mm	17
20-29 mm	13
30- 39 mmm	4

Table 2. Number of patients according to size of the cyst

Comparison was made between the size of cyst and time of presentation to the hospital (Table 3).

Presentation to hospital after occurrence of the cyst		Maximum transverse diameter of the cyst (millimeters)	
		1-19	>20
0-1 yrs		11	6
>1 yrs		6	11

Table 3. Comparison between the size of the cyst and presentation to hospital after occurrence of the cyst

No significant association existed between delayed presentation and increase in size of the . There was recurrence after surgery in three out of 34 cases making the recurrence rate as 8.82%. Two of them were conservatively managed with wide bore needle aspiration and dressing whereas one patient required revision surgery.

DISCUSSION

Thyroglossal duct cyst is a congenital anomaly that results due to persistence of thyroglossal duct during its descent from the foramen cecum to the thyroid gland in the neck. During its descent, the duct is mostly trapped in the hyoid bone because the hyoid develops from lateral to medial and changes its position, too. Surgery is the mainstay of treatment of thyroglossal duct cysts. The prototype surgery for this condition is Sistrunk's operation which aims to remove the cyst along with the body of hyoid bone in between its two greater cornu and a part of the muscles above the hyoid bone aiming at the foramen cecum. This study was performed to share the author's experience about thyroglossal duct cysts and their surgery in a medical college over a period of 10 years.

The number of patients in our study were 34 with slight male predilection. This is in consistent with the study carried out by Swaid et al.[10] In their study, there was male predominance with male to female ratio of 2.3:1.

Although one of the congenital disorders, thyroglossal duct cyst is usually seen after birth. The most common presentation in our study was the first decade of life followed by second decade and others. Patients of first and second decade made around two thirds of all cases (64.7%). However, Arunkumar et al [11] in a study of 15 patients found that the cyst commonly presented at the second decade of life. We had a statistically significant presentation in the young age which also confirms that TGDC is the disease of children.

Bimodal age presentation was noted in our study. The children had their mean age of occurrence at the age of 7.94 years whereas adults had a mean age of presentation of 31.7 years. Average age at presentation in our study was 19.76 years. Similar results have been reported by other researchers in the literature.[12, 13]

Location of the cyst in relation to the hyoid bone is also important for the surgical planning. Cysts above the hyoid are less vulnerable to recurrence. As the tract passes anteriorly, posteriorly or through the hyoid bone, a part of hyoid bone is removed in Sistrunk's operation. In our study, infrahyoid location was the most common and was found in 29 patients (85.2%) and suprahyoid location was found in 5 patients (14.8%). In a study performed by Thompson et al [14] in 685 patients, infrahyoid location was the most common. In a study performed by Sarkar et al [15], majority of cysts (83.3%) were subhyoid in location followed by suprahyoid in 10% of the cases. These studies are in consistent with our study. Similar observations have been reported by Debnath et al. [16]

In our study, we could not find any statistically significant association between delayed presentation and increase in size of the cyst in our study. There is no mention of this fact in the literature, too.

Size of the thyroglossal duct cyst was found to be ranging from 10 mm to 39 mm in greatest dimension in our study, with 50% less than 20 mm in greatest dimension. However, in a study performed by Patigaroo et al, [17] it was observed that majority of the cyst size was from 16-30 mm in greatest dimension.

The average time from occurrence of the cyst to the presentation to hospital was 4.16 years in our study with 50% presenting within one year of occurrence of the swelling. In one study, it was found that duration of the symptoms prior to presentation to hospital varied from 1 week to 6 years (median: 6months).[18]

Recurrence of the cyst after Sistrunk's operation occurred in three of 34 in our patients (8.82%). Out of them, only one required revision surgery. The recurrence rates in Lawrence's study and Tom's study were reported to be 10.8% and 11.5% respectively. [19, 20]

CONCLUSION

Thyroglossal cysts present as small to medium size midline neck swellings that moves both with protrusion of tongue and swallowing. It usually presents at the first decade of life with bimodal age presentation. Infrahyoid location is more common, there is no association between initial or late presentation and the definite surgery is Sistrunk's operation with acceptable chances of recurrence.

CONFLICT OF INTEREST

None

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