

## STUDY OF PRESENTATION AND MANAGEMENT OF THYROGLOSSAL CYST IN INDIAN POPULATION

Shailendra Singh<sup>1</sup>, Raj Kumar Mathur<sup>2</sup>, Manish Kaushal<sup>3</sup>, Shashi Shankar Sharma<sup>4</sup>

<sup>1</sup>Resident, Department of General Surgery, M. G. M. Medical College and M. Y. Hospital, Madhya Pradesh.

<sup>2</sup>Professor, Department of General Surgery, M. G. M. Medical College and M. Y. Hospital, Madhya Pradesh.

<sup>3</sup>Associate Professor, Department of General Surgery, M. G. M. Medical College and M. Y. Hospital, Madhya Pradesh.

<sup>4</sup>Assistant Professor, Department of General Surgery, M. G. M. Medical College and M. Y. Hospital, Madhya Pradesh.

### ABSTRACT

#### BACKGROUND

Thyroglossal cyst is a congenital malformation that occurs due to incomplete closure of the thyroglossal duct. Apart from quiescent embryological remnant, it presents clinically as a midline cystic swelling that moves with tongue protrusion; present at any age, often requires surgical excision. Complete excision of tract is necessary to prevent recurrence. Sistrunk's surgery is done for thyroglossal duct remnants.

#### OBJECTIVE

Gender wise distribution of patients of thyroglossal cyst. To know the presentation of thyroglossal cyst in the patients admitted in M.Y.H. Management of thyroglossal cyst in Indian population.

#### MATERIAL AND METHODS

Sample size was of 30 patients of age ranged 0 to 70 years, operated in M.Y. Hospital, Indore over a period of 2003 to 2013 (10 years). Patient's data was collected from medical record in retrospective manner and from 2014 to 2015 in prospective manner, included patients of clinically diagnosed thyroglossal cyst. All 30 patients were primary case of thyroglossal cyst with no recurrence cases. The gender preponderance, various presentation and management options were observed. Complications or recurrence if any were noted.

#### RESULT

A total 30 cases of thyroglossal cyst with mean age of 23 years were included in study. There were fifteen males and fifteen female patients. Most common site of cyst was infrahyoid region. All 30 patients were managed surgically as definitive management. Two patients initially underwent excision of cyst only, both of them had "recurrence" and managed second time with Sistrunk's operation. There was no recurrence following Sistrunk's procedure on followup up to 6 months.

#### CONCLUSION

The most common presentation of thyroglossal cyst is a midline cystic swelling that moves with tongue protrusion. The standard surgical approach to thyroglossal cyst is Sistrunk's operation with low recurrence rate. Malignancy within thyroglossal cyst is very rare but should be rule out in all cases.

#### KEYWORDS

Thyroglossal Cyst, Sistrunk's Operation, Developmental Anomaly.

**HOW TO CITE THIS ARTICLE:** Singh S, Mathur RK, Kaushal M, et al. Study of presentation and management of thyroglossal cyst in Indian population. J. Evid. Based Med. Healthc. 2016; 3(50), 2574-2577. DOI: 10.18410/jebmh/2016/566

**INTRODUCTION:** The thyroglossal cyst is a well-recognised developmental abnormality which arises in some 7% of the population. Consequently, it represents the most common type of developmental cyst encountered in the neck region.<sup>1</sup> Thyroglossal cysts are usually considered to be a benign embryonic malformation where the thyroglossal duct fails to obliterate after descent of the thyroid gland.<sup>2</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 10th week. However, if the thyroglossal duct is not obliterated, the secretory epithelium of the thyroglossal duct may result in a thyroglossal cyst. Thyroglossal cysts may be observed at any age, but most are noted during childhood.<sup>3,4</sup>

Thyroglossal cysts can be found anywhere in the midline from the submental region to the suprasternal notch, but are most commonly located halfway between these extremes, near the hyoid bone.<sup>3</sup> The cyst usually presents itself as a painless, asymptomatic midline swelling and may cause a neck mass or a nodule, which occasionally may become infected and rarely gives rise to carcinoma.<sup>3,4</sup>

*Financial or Other, Competing Interest: None.*

*Submission 30-05-2016, Peer Review 03-06-2016,*

*Acceptance 21-06-2016, Published 23-06-2016.*

*Corresponding Author:*

*Dr. Shailendra Singh,*

*Department of General Surgery,*

*M. G. M. Medical College and M. Y. Hospital,*

*Indore, Madhya Pradesh.*

*E-mail: shailendrasinghssmc@gmail.com*

*DOI: 10.18410/jebmh/2016/566*

On physical examination, thyroglossal cysts present as nodular swelling in neck that move with swallowing or protrusion of the tongue.<sup>5</sup> Simple incision and drainage or partial resection of a thyroglossal duct cyst virtually always leads to recurrence. Therefore, complete excision of cyst with the Sistrunk's procedure is the recommended surgical approach.<sup>6</sup>

Walter Ellis Sistrunk in 1920 described a surgical technique to remove the thyroglossal cyst with a core of normal tissue including the central portion of hyoid bone, thereby reducing the recurrence rate.<sup>7</sup> Although excision of the central portion of the hyoid bone had previously been described by Schlange in 1893,<sup>8</sup> it was Sistrunk's addition of further excision of a core of normal tissue which remains the operation of choice to this day and compared with simple excision of thyroglossal cysts to reduce the recurrence rate from 50% to 4%.<sup>9</sup>

**MATERIAL AND METHODS:** This observational study was carried out in the Department of Surgery, MGM Medical College & M.Y. Hospital. A total thirty cases of both sexes with the age ranged from 0 to 70 years, operated in M.Y. Hospital, Indore over period of 2003 to 2013 (10 Years), patients' data was collected from medical record in retrospective manner and from 2014 to 2015 in prospective manner, included patients of clinically diagnosed thyroglossal cyst. A detailed history and thorough physical examination was done. A semi-structured proforma was made to collect all necessary information of patient. Ultrasound studies were done in all cases to confirm the cystic nature of lesion and the presence of normal thyroid gland at its normal site. Thyroid function test was also done in all cases to assess the function of thyroid gland.

Management was mainly surgical, most common performed surgery was Sistrunk's operation in 27 cases as a primary surgery and in two cases as a second time surgery for recurrent cases following excision of cyst in first operation. One patient underwent total thyroidectomy as found to be malignant on biopsy. Followup was done up to six months for any complications and/or recurrence.

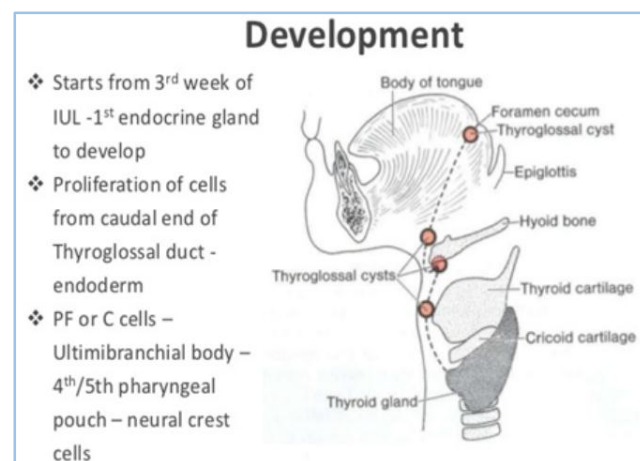
**RESULTS:** In our study, total 30 patients of thyroglossal cyst were included with age group ranging from 0-70 years, the maximum cases were in 11-20 years of age group (36.66%) with mean age being 23 years. Of the total 30 cases, fifteen (50%) patients were male and fifteen (50%) were female.

Patients presented with more than one complaint. Maximum of the cases i.e. 28 (93.3%) patients presented with midline cystic swelling that moves with protrusion of tongue. Among these 28 cases, eight cases (26.66%) also complained of sore throat, four cases (13.33%) with dysphagia. However, two cases (6.66%) presented with sinus as chief complaint. As per the location of the cyst, infrahyoid was the most common location seen in 17 cases (56.66%). Suprahyoid was the second most common location seen in 10 cases (33.33%). However, 2 cases presented at juxtahyoid region

on left side (6.66%) and 1 case presented with cyst in suprasternal region.

On Ultrasound examination, the cyst presented as an anechoic lesion in eleven cases (36.66%) (04 suprahyoid, 06 infrahyoid and single suprasternal location), eighteen cases (60%) as hypoechoic lesion (07 suprahyoid, 09 infrahyoid and 02 juxtahyoid) and single case (03.33%) as heterogeneous lesion. Duration of symptoms of cyst range from 1 to 6 years, 12 patients (40%) presented with cyst for a duration of 1 year, 10 patients (33.3%) with cyst for a period of 2 years, three patients (10%) with cyst for 3 years, 02 patients (06.6%) with cyst for 4 years, one patient (03.3%) with cyst for 5 years and two patients (06.6%) with cyst for 6 years. All the 30 cases were managed surgically. Two cases (06.66%) were operated with excision of cyst only, twenty-seven cases (90%) underwent Sistrunk's procedure and one patient operated for total thyroidectomy. Recurrence was seen in both the cases which underwent excision of cyst initially. No recurrence seen in cases operated with Sistrunk's procedure.

**DISCUSSION:** The thyroid gland is the largest endocrine gland of the body and is the first of the body's endocrine glands to develop. It begins to develop in the 3<sup>rd</sup> week of foetal life as a median outgrowth from the floor of primitive pharynx. This thyroid primordium originates at the level of the foramen caecum, which in the adult lies at the junction of the anterior two-third and posterior one-third of the tongue. The primitive thyroid descends in the neck, penetrates through the underlying mesoderm of the tongue and floor of the mouth musculature, and eventually passes anterior to the developing hyoid bone and laryngeal cartilages. The anlage of the gland reaches its final position in inferior part of neck by the 7<sup>th</sup> week of gestation after descending anterior to the thyrohyoid membrane and strap muscles (sternothyroid and sternohyoid muscles).



During its migration, the anlage of thyroid gland is connected to tongue by a narrow tubular structure, the thyroglossal duct. This duct normally involutes by the 8<sup>th</sup>-10<sup>th</sup> gestational week. The site of the original opening of the thyroglossal duct persists as foramen caecum of the tongue, with the inferior end of the canal becoming pyramidal lobe of the thyroid gland.<sup>10,11</sup> If any portion of the thyroglossal duct persists, secretions from the epithelial lining (likely

secondary to repeated local infection and inflammation) may give rise to cystic lesions.<sup>6</sup>

The duct is immediately associated with developing hyoid bone, usually passing through it. As a consequence, most thyroglossal duct cysts are found either at the level of hyoid bone (15% of cases) or in the strap muscles (65%) immediately inferior.<sup>12</sup> Thyroglossal duct anomalies are the most common developmental malformations in the neck and constitute 70% of all the congenital cervical masses. The thyroglossal cyst is more common in children under the age of 5 years. And 60% of lesions diagnosed before the age of 20 years.<sup>13</sup> The most common age of presentation of patients in our study is 10-20 years of age (36.66%). The earliest presentation was seen at the age of 5 years and the spectrum extended till the age of 65 years.

In our study, a total 30 cases were taken, of which the number of male and female patients is equal. There is no sex preponderance in patients of thyroglossal cyst. This is in accordance to study of Allards in 1982.<sup>6</sup> Thyroglossal cyst usually presents as fluctuant swelling in the midline of the neck along the line of thyroid descent. According to study of Ali L.S. et al<sup>14</sup> in 2007 in Saudi Arabia, the presenting feature of thyroglossal cyst may be midline neck swelling, sore throat, pain, dysphagia, hoarseness of voice, globus. In our study, most common presentation of cyst is midline neck swelling moving with tongue protrusion in 28 patients (93.33%). Eight patients also presented with sore throat along with swelling and four patients with dysphagia. However, two patients presented with discharging sinus.

Cyst may be found anywhere from base of tongue to manubrium. Asmat et al<sup>15</sup> in 2007 studied 41 cases of thyroglossal cyst and observe that cyst was most commonly located in infrahyoid region. In our study also, the most common location of cyst was in infrahyoid region in 17 patients (56.66%), suprahyoid in 10 patients (33.33%), two patients (6.66%) with cyst on juxtahyoid on left side of neck and one patient (3.33%) in suprasternal region. Though the diagnosis of thyroglossal cyst is mainly clinical, ultrasonography is of great help. In our study, all patients were subjected to ultrasonography not only for the diagnostic purpose, but also to evaluate normal thyroid gland in the neck. All patients were subjected for thyroid profile along with routine blood investigation.

In our study, ultrasonographic finding of majority of cases (60%) was a hypoechoic picture; was different from study done by Ahuja A.T. et al<sup>16</sup> who reported 28% each for anechoic, pseudosolid and heterogeneous picture. In one case, the sonographic finding was heterogeneous lesion, which was later found to be malignant on biopsy after resection. The presentation of the cyst varied in duration as mostly the cyst was asymptomatic. In our study, most patients (40%) presented with symptoms of thyroglossal cyst for one year. However, duration of cyst ranged from 1 to 6 years. Most effective management for thyroglossal cyst is surgical intervention and this was performed in all cases. The procedure of choice was Sistrunk's operation, in which we excise the whole tract along with the portion of attached hyoid bone. The thyroglossal tract commences at the

foramen caecum and descends through the tongue musculature, attaching to the hyoid bone and finishing at the thyroid isthmus. Thyroglossal cysts can occur anywhere in this tract.

There is a significant risk of recurrence if thyroglossal cyst is excised leaving a remnant of this tract. The Sistrunk's procedure is recommended as the main operation of choice, especially in adults in whom a more extended tract resection should be performed.<sup>7</sup> since the whole tract is removed in Sistrunk's procedure, no recurrence is possible. All 30 patients in our study were managed surgically. The most common surgery performed was Sistrunk's procedure. Two patients were initially operated by excision of cyst only but recurrence was seen in both the cases and they were taken for second procedure i.e. Sistrunk's. According to Jamal S et al,<sup>17</sup> about 1% of thyroglossal cyst are found ultimately to harbour thyroid carcinoma which was first reported by Ucherman in 1915. In our study, one patient (3.33%) underwent total thyroidectomy as was found to be a malignant lesion of thyroglossal cyst on biopsy.

**CONCLUSION:** Thyroglossal cyst arises from a persistent epithelial tract. Thyroglossal cyst is usually present in age group of 5 to 20 years, although they may be found in patients of any age with equal sex distribution. On physical examination, they present as a painless midline mass that moves upward with tongue protrusion. It is located anywhere from base of tongue to manubrium, but commonly in infrahyoid region. Diagnosis is mainly clinical. Ultrasonography will help to confirm the diagnosis and identify the presence of normal thyroid gland in neck. The thyroid function test should be done in all cases of thyroglossal cyst. Thyroglossal cysts are treated surgically by Sistrunk's operation. There is no recurrence in our study following Sistrunk's procedure after followup period of 6 months. Malignant transformation should be ruled out in all cases of thyroglossal cyst and fistula.

## REFERENCES

1. Mondin V, Ferlito A, Muzzi E, et al. Thyroglossal duct cyst: personal experience and literature review. *Auris Nasus Larynx* 2008;35(1):11-25.
2. Cheng CY, Chang YL, Hsiao JK, et al. Metachronous thyroglossal duct cyst and inferior parathyroid cyst: a case report. *Kaohsiung J Med Sci* 2008;24(9):487-491.
3. Organ GM, Organ CH. Thyroid gland and surgery of the thyroglossal duct: exercise in applied embryology. *World J Surg* 2000;24(8):886-890.
4. Shahin A, Burroughs FH, Kirby JP, et al. Thyroglossal duct cyst: a cytopathologic study of 26 cases. *Diagn Cytopathol* 2005;33(6):365-369.
5. Acierno SP, Waldhausen JHT. Congenital cervical cysts, sinuses and fistulae. *Otolaryngol Clin North Am* 2007;40(1):161-176.
6. Allard RH. The thyroglossal cyst. *Head Neck Surg* 1982;5(2):134-146.

7. Sistrunk WE. The surgical treatment of cysts of the thyroglossal tract. *Ann Surg* 1920;71(2):121-124.
8. Schlange H. Ueber die fistula colli congenita. *Arch Klin Chir* 1893;46:390-392.
9. Brown PM, Judd ES. Thyroglossal duct cysts and sinuses. Results of radical (Sistrunk) operation. *Am J Surg* 1961;102:495-501.
10. Langmann J. *Medical embryology*. 3<sup>rd</sup> edn. Baltimore: Williams & Wilkins 1975:p. 3.
11. Reede D, Bergeron RT, Som PM. CT of thyroglossal duct cyst. *Radiology* 1985;157(1):121-125.
12. Harnsberger HR. *Handbook of head and neck imaging*. 2<sup>nd</sup> edn. St Louis, Mo: Mosby 1995:199-223.
13. Madana J, YolmoD, Saxena SK, et al. True thyroglossal fistula. *Laryngoscope* 2009;119(12):2345-2347.
14. Swaid AI, Al-Ammar AY. Management of thyroglossal duct cyst. *The Open Otorhinolaryngology Journal* 2008;2:26-28.
15. Asmat, Imad, Saeed. Thyroglossal duct cyst: a descriptive case study of 41 cases. *JPMI* 2010;24(3):231-233.
16. Ahuja AT, King AD, King W, et al. Thyroglossal duct cyst: sonographic appearance in adults. *AJNR Am J Neuroradiol* 1999;20(4):579-582.
17. Jamal S, Mamoon N, Lauqman M. Thyroglossal duct carcinoma. *J Coll Physician Surg PAK* 2002;12(12):755-759.