

## Original Article

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# Clinical Presentation of Thyroglossal Cysts and Sinuses

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### Abstract:

**Objective:** To see the clinical presentation of thyroglossal cysts and sinuses.

**Methods:** Observational type of Cross sectional study.

Department of ENT & Head-Neck Surgery in Sher-E-Bangla Medical College Hospital, Barishal from September 2014 to February 2015. All patients attended in the Department of ENT and Head Neck Surgery in Sher-E-Bangla Medical College Hospital, Serum TSH, USG of thyroid swelling and FNAC were done for diagnoses and for evaluation.

**Results:** Thyroglossal cysts and sinuses were found in 23(63.9%) and 13(36.1%) cases respectively. The mean age of presentation was found  $16.6 \pm 11.3$  years in cysts group and  $15.5 \pm 7.2$  years in sinus group. Regarding the site of cysts 4(17.4%) cases was suprahyoid, 11(47.8%) infrahyoid and 8(34.8%) at the level of hyoid. Regarding the site of sinus 1(7.7%) case was suprahyoid, 9(69.2%) infrahyoid and 3(23.1%) at the level of hyoid. All the patients had normal thyroid gland in both group, all of them had normal serum TSH level. FNAC was done in all cyst patients and shows normal cystic lesion with no malignancy. But in sinus patients only one FNAC was done and reported as cystic lesion.

**Conclusion:** Thyroglossal cysts and sinuses were more common in 2<sup>nd</sup> decade and male predominant. Majority of the cysts are Infrahyoid and on the right side of midline and majority of sinuses are Infrahyoid and on the right side. Development of sinuses is due to operation following abscess formation in majority of cases.

**Keywords:** Thyroglossal cyst, Thyroglossal sinus, Presentation.

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**Introduction:**

Thyroglossal duct cyst (TDC) is the most common type of developmental cyst found in the neck region. Thyroglossal duct extends from the base of the tongue and the thyroid gland and failure of its obliteration leads to the development of Thyroglossal cyst.<sup>1</sup>

The thyroid gland originates from thyroglossal duct which invaginates from the foramen caecum present in the floor of the pharyngeal gut on the 17<sup>th</sup> day of gestation. Then the gland gradually descends in front of the pharynx as a bilobed diverticulum. By the 7<sup>th</sup> week of gestation it reaches its final position in the neck. This diverticulum usually disappears by the 10<sup>th</sup> week of gestation. Persistence of any part of this duct gives rise to thyroglossal cyst.

Literature review shows that this developmental cyst develops in about 7% of the population. Malignancy can be found in about 1% of the patients suffering from TDC.<sup>1,2</sup> Till now about one hundred and fifty cases of TDC carcinoma have been reported in different literatures, most of them are of papillary type.<sup>3</sup> This cyst often presents as a cystic lesion which is painless, mobile, fluctuant and usually in the midline of the neck. The investigation techniques such as Ultrasonography(USG), FNAC, scintigraphy and Computerized Tomography (CT) of neck are used in the confirmation of diagnosis of TDC and associated carcinoma. Sistrunk's procedure since 1920 is the gold standard treatment for TDC.

Thyroglossal duct anomalies can be found in any age group. Two thirds of anomalies are found within first 3 decades and more than fifty percent are identified before the age 10 years.<sup>4</sup> The most common presentation is a painless cystic neck mass near the hyoid bone. They are most commonly found immediately adjacent to the hyoid bone (66%), they can also be found between the tongue and hyoid (20 to 25%), between the hyoid and pyramidal lobe (25 to 65%), within the tongue or within the thyroid.<sup>5,6</sup> The mass

usually moves with swallowing or protrusion of the tongue.

Concurrent or prior infection is the most common presentation in adults and it occurs in about one third of the patients.<sup>7</sup> One fourth of patients present with a draining sinus resulting from spontaneous drainage or surgical drainage of an abscess. Other uncommon presentations may be a lateral cystic neck mass, severe respiratory distress or an anterior tongue fistula or may present with coexistent branchial cleft anomalies.<sup>8</sup> The preoperative evaluation for a patient who has a suspected thyroglossal duct cyst includes a complete history and physical examination, preoperative ultrasound, FNAC and screening thyroid stimulating hormone (TSH) level. The purpose of our study is to see the clinical presentation thyroglossal cysts and sinuses.

**Materials and Methods:**

The study was observational type of cross sectional study. It was conducted in Sher-E Bangla Medical College, Barisal from September 2014 to February 2015. Convenient and purposive non-randomized sampling technique was applied and all patients (36 cases) with clinical diagnosis of thyroglossal cysts and sinuses were taken as sample in this study.

All patients attending indoor and outdoor of the department of ENT and head neck surgery AND General Surgery in Sher- E Bangla Medical college Hospital, Barisal within the mentioned period with swelling and sinuses in front of neck examined and those with clinical diagnosis of thyroglossal cysts and sinuses were included in the study population. Thirty six cases were enrolled in the study. Those with far lateral neck swelling and those with thyroid swelling were excluded from the study. Serum TSH, USG of thyroid and swelling and FNAC of swelling were done for supporting the diagnosis and evaluation.

Statistical analyses were done by using the Statistical Package for Social Sciences

version 20.0 for Windows (SPSS Inc. Chicago, Illinois, U.S.A.). Continuous variables were analyzed by mean values. The quantitative findings were indicated by frequencies and percentages.

### Results:

A total Of 36 patients were enrolled in the study. 23(63.9%) cases were cysts and 13(36.1%) cases were sinuses. It was observed that more

than one third 8(34.8%) patients were belonged to age 11-20 years in cysts group and 5(38.5%) in sinus group. The mean age of presentation was found  $16.6 \pm 11.3$  years in cysts group and  $15.5 \pm 7.2$  years in sinus group. 15(65.2%) patients were male in cysts group and 9(69.2%) in sinus group, 8(34.8%) patients were female in cysts group and 4(30.8%) in sinus group. Socioeconomic status was found 14(60.9%) patients were middle class in cysts group and 8(61.5%) in sinus group.

**Table I:**  
*Distribution of the study patients by demographic profile (n=36)*

Demographic profile		Cysts (n=23)		Sinus (n=13)	
		n	%	n	%
Age (in years)	1 – 10	7	30.4	6	46.1
	11 -20	8	34.8	5	38.5
	21 – 30	4	17.4	2	15.4
	>31	4	17.4	0	0.0
	Mean±SD	16.6 ±11.3		12.5 ±7.2	
Range (min, max)	3 , 40		4, 25		
Sex	Male	15	65.2	9	69.2
	Female	8	34.8	4	30.8
Socioeconomic status	Rich	0	0.0	0	0.0
	Middle class	14	60.9	8	61.5
	Poor	9	39.1	5	38.5

**Table II:**  
*Distribution of the patients by presenting features (n=36)*

Presenting complaints		Cysts (n=23)		Sinus (n=13)	
		n	%	n	%
Swelling in neck	Present	23	100	2	15.4
	Absent	0	0.0	11	84.6
Opening in neck	Present	0	0.0	13	100.0
	Absent	23	100.0	0	0.0
Discharge from opening	Present	1	4.3	12	92.3
	Absent	22	95.7	1	7.7
Pain or discomfort	Present	4	17.4	3	23.1
	Absent	19	82.6	10	76.9
Dysphagia	Present	1	4.3	0	0
	Absent	22	95.7	13	100
		Mean ±SD		Mean ±SD	
Duration (in years)		2.9 ±2.8		3.7 ±3.6	
Range (min, max)		0.1, 11		1, 15	

It was observed that 23(100.0%) patients had swelling in neck in cysts group, 2(15.4%) in sinus group. Opening in neck was 13(100.0%) in sinus group. 1(4.3%) patients had discharge from opening in cysts group, 12(92.3%) in sinus group and 1(4.3%) patients had dysphagia in cysts group, dysphagia was not found in sinus group. The mean duration of presentation was found  $2.9 \pm 2.8$  years in cysts group with range from .01 to 11 and  $3.7 \pm 3.6$  years in sinus group with rage from 1 to 15.

It was observed that 2(8.7%) patients had history of pain in cysts group, 8(61.5%) in sinus group. History of abscess formation was

found 2(8.7%) in cysts group, 11(84.6%) in sinus group. In cyst group there was no history of operation, but in sinus group 6(46.2%) had history of operation.

It was observed that of 4(17.4%) suprahyoid cysts, 1(25.0%) was on the left side, 2(50.0%) on right side and 1(25.0%) in the midline. Of 11(47.8%) Infrahyoid cysts, 3(27.3%) was on the left side, 4(36.4%) on right side and 4(36.4%) in midline. Of 8(34.8%) cysts at the level of hyoid, 2(25.0%) was on left side, 3(37.5%) on right side and 3(37.5%) in the midline.

**Table III:**  
*Distribution of the study patients by past history (n=36)*

Past history		Cysts (n=23)		Sinus (n=13)	
		n	%	n	%
History of pain	Yes	2	8.7	8	61.5
	No	21	91.3	5	38.5
History of abscess formation	Yes	2	8.7	11	84.6
	No	21	91.3	2	15.4
History of Operation	Yes	0	0.0	6	46.2
	No	23	100	7	53.8

**Table IV:**  
*Distribution of cysts according to site (n=23)*

Site in cysts	Total (n=23)		Left (n=6)		Right (n=9)		Middle (n=8)	
	n	%	n	%	n	%	N	%
Suprahyoid	4	17.4	1	25.0	2	50.0	1	25.0
Infrahyoid	11	47.8	3	27.2	4	36.4	4	36.4
At the level of hyoid	8	34.8	2	25.0	3	37.5	3	37.5
Total	23	100.0	6	26.1	9	39.1	8	34.8

**Table V:**  
*Distribution of sinus according to site (n=13)*

Site of sinus	Total n=13		Left (n=3)		Right (n=8)		Middle (n=2)	
	n	%	n	%	n	%	n	%
Suprahyoid	1	7.7	0	0.0	1	100	0	0.0
Infrahyoid	9	69.2	3	33.3	6	66.7	0	0.0
At the level of hyoid	3	23.1	0	0.0	1	33.3	2	66.7
Total	13	100.0	3	23.1	8	61.5	2	15.4

**Table VI:**  
*Distribution of the study patients by investigation (n=36)*

Investigation		Cysts(n=23)		Sinus (n=13)	
		n	%	n	%
Other ENT examination	Serum TSH				
	Normal	23	100	13	100
	Raised	0	0.0	0	0.0
	Reduced	0	0.0	0	0.0
FNAC	Cysts	23	100	1	7.8
	Neoplastic	0	0.0	0.0	0.0
	Thyroid tissue	0	0.0	0.0	0.0
	Not done	0	0.0	12	92.2
USG findings	Swelling				
	Cystic	23	100.0	-	-
	Solid	0	0.0	-	-
	Thyroid Gland				
	Normal	23	100	13	100
	Ectopic	0	0.0	0	0.0

It was observed that only one suprahyoid sinus was found which was on the right site of midline. Infrahyoid sinuses were 9(69.2%) in number, of them 3(33.3%) on the left and 6(66.7%) on the right side, 3 sinus was found at the level of the hyoid bone and of them 2(66.7%) was on the right side of midline.

It was observed that all the patients had normal thyroid gland in both groups, all of them had normal serum TSH level. FNAC was done in all cyst patients and shows normal cystic lesion. No neoplastic and ectopic thyroid tissue was detected in FNAC. But in sinus patients only one FNAC was done and reported as cystic lesion and in 12 patients FNAC was not done.

#### **Discussion:**

This cross sectional study was carried out with an aim to see the age of presentation of thyroglossal cyst and sinuses, sex

distribution, site of presentation of thyroglossal cysts and also to identify the cause of development of thyroglossal sinuses.

A total of 36 patients with swelling and sinuses in front of neck and also clinically diagnosed of thyroglossal cysts and sinuses attended in the Department of ENT and head neck surgery in Sher-E-Bangla Medical College Hospital, Barisal between September,2014 to February,2015 were included in this study. All midline neck swellings and sinuses, all recurrent cases of thyroglossal cysts and sinuses, all age group and both sex were enrolled in this study. Patients without midline neck swelling and sinuses and thyroid swellings were excluded from the study. Our findings are discussed and compared with previously published relevant studies.

Thyroglossal duct cyst (TDC) is the most common type of developmental cyst found in

the neck region. It develops due to failure of obliteration of the thyroglossal duct. Mondin et al. (2008) found in their study that this developmental abnormality arises in about 7% of the population.<sup>1</sup> About 1% of the patients having TDC may have an association with malignancy.<sup>1,2</sup> Up to now one hundred and fifty cases of TDC carcinoma have been reported which are predominantly of papillary type.<sup>3</sup> In our study, no case was found with malignancy.

In our study, it was observed that more than one third (34.8%) patients were belonged to age 11-20 years in cysts group and 38.5% in sinus group. The mean age of presentation was found  $16.6 \pm 11.3$  years in cysts group and  $15.5 \pm 7.2$  years in sinus group. Jugmohansingh et al. (2015) found the age range from birth to 51 years old.<sup>9</sup> With respect to age, 2 peaks were noted at 5-10 years and 20-30 years. Under 10 years of age, seven people had thyroglossal duct cysts. Within the 10-50 years age group, 9 patients had cysts. In this series, only one patient had a cyst over the age of fifty, which is similar with the current study. Tristan et al. (2015) found the mean age of presentation of cysts was 29 years with ranged from 1-78 years and also the mean age for the development of a discharging sinus was 14 years with ranged from 0-64 years, which is comparable with the current study.<sup>10</sup> Ansa et al. (2013) found nearly half of the patients (49.4%) with sinus were between ages 60 years and 79 years, whereas patients aged <40 years and those aged  $\geq 80$  years had only 4.3% and 15.8% of cases respectively.<sup>11</sup>

In our study, it was observed that almost two third (65.2%) patients were male in cysts group and 69.2% in sinus group, 34.8% patients were female in cysts group and 30.8% in sinus group. Ansa et al. (2013) reported that the incidence of sinus is higher in males than in females, which are comparable with

the current study.<sup>11</sup> In another study Tristan et al. (2015) found male to female ratio was 1:1.<sup>10</sup> On the other hand Mikac and Biukovic (2016) found the male to female ratio were 1:1.17.<sup>12</sup> Similarly female predominance also observed by Jugmohan singh et al. (2015) and Choi et al. (2013).<sup>9,13</sup>

Tristan et al. (2015) found 30.0% had pain in cysts group and 21.0% in sinuses group. Almost one fourth (23.4%) patients had dysphagia in cysts group and 7.1% in sinuses group.<sup>10</sup> In our study, it was observed that 8.7% patients had history of pain in cysts group, 61.5% in sinus group. History of abscess formation was found 8.7% in cysts group, 84.6% in sinus group and history of operation was found 46.2% in sinus group but no history of operation was found in cysts group.

In our study 4 (17.4%) cases was suprahyoid, out of which 25.0% in left side, 50.0% in right and 25.0% in midline in cyst group and 1 (7.7%) case in sinus group was suprahyoid which was in right side. Infrahyoid cysts found in 11 (47.8%) cases, among them 27.3% in left side, 36.4% in right and 36.4% in midline. Infrahyoid sinuses were found in 9 (69.2%) cases of them 33.3% was on the left and 66.7% in right side. In our study, it was also observed that 8 (34.8%) cases was found at the level of hyoid, among them 25.0% in left side, 37.5% in right and 37.5% in midline in cyst group. Three (23.1%) sinuses were at the level of the hyoid of them 66.7% in the midline and 33.3% in right side.

Thyroglossal duct cysts are usually located in the midline of the neck, below the hyoid bone.<sup>12</sup> Although different results are found, studies show that 40% of TDC lie outside the midline. Regarding to the height, over 82.0% of TDC are located at the infrahyoid muscles and only 5% at the suprahyoid ones.<sup>14</sup> Jugmohan singh et al. (2015) found that symptomatic patients was 65.0%, midline

71.0% and right lateral 29.0% with no left lateral cases.<sup>9</sup> Thompson et al. (2016) found 76.0% TGDC were infrahyoid.<sup>15</sup> Kutuya and Kurosaki, 2008; Sidell and Shapiro, 2011 and Lima and Liapis, 1987, observed mixed results, with 61.0% of TGDC at or above the hyoid bone and others found the hyoid bone and Infrahyoid region to be the most common site for TGDC.<sup>16-18</sup> In another study Pounds (1981) found about 15 to 50% are at the level of hyoid bone, 20 to 25% are suprahyoid, and 25 to 65% are infrahyoid.<sup>19</sup> There were no gender predilection reported, and the age of the affected population ranged from birth to 70 years. About 50% of patients presented before the age of 20 years.<sup>20</sup> The cyst may lie anywhere within the thyroglossal tract that extends from the base of the tongue to the suprasternal region. About 90% of thyroglossal duct cysts lie at or very close to midline.<sup>20</sup> Soliman and Lee (2006) found the most common site (61% of cases) is between the thyroid gland and the hyoid bone. Other potential sites include suprahyoidal (24%), suprasternal (13%) or intralingual (2%) locations.<sup>21</sup> Gaillard et al. (2008) reported in their study that suprahyoid cysts observed in 20-25%, at the level of hyoid bone 30% ranged 15-50% and infrahyoid 45% ranged from 25-65%.<sup>22</sup>

It was observed that all the patients had normal thyroid gland in both groups and all of them had normal serum TSH level. FNAC was done in all cyst patients and shows normal cystic lesion. No neoplastic and ectopic thyroid tissue was detected in FNAC. But in sinus patients only one FNAC was done and reported as cystic lesion and in 12 patients FNAC was not done.

Preoperative imaging with ultrasound, computed tomography (CT), or scintigraphy is usually recommended in order to evaluate the cyst, the thyroid gland and possible ectopic thyroid tissue which may present

anywhere in Thyroglossal duct.<sup>23</sup> The incidence of ectopic thyroid tissue within the cyst wall has ranged from 0.5% to 5.7%.<sup>24-26</sup> In this study, it is observed that all the thyroid glands were in normal position. No ectopic thyroid noted in relation to the thyroglossal cysts and sinuses.

#### **Conclusion:**

Thyroglossal cysts are more common and more than one third of the patients have sinuses. Thyroglossal cysts and sinuses are more frequent in 2nd decade and male predominant and most of the patients are from middle income family. Majority of the cysts are infrahyoid and on the right side of midline and also majority of sinuses are infrahyoid and on the right side.

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