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Research Article

Clinical Presentation of Thyroglossal Cysts and Sinuses

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Abstract

The thyroglossal duct cyst is the most common congenital cystic lesion in the neck. It usually occurs in midline and is asymptomatic. Sinuses usually develop due spontaneous rupture or incision drainage following infection of the cysts. Main objective is to see the clinical presentation of thyroglossal cysts and sinuses. Observational type of study at Department of ENT in Sher-e-Bangla Medical College Hospital from 2011 to 2016. Thyroglossal cysts and sinuses were found 23(63.9%) and 13(36.1%) respectively. The mean age of presentation was found 16.6 ± 11.3 years in cysts group and 15.5 ± 7.2 years in sinus group. Almost two third (65.2%) patients were male in cysts group and 9 (69.2%) in sinus group. All (100.0%) patients had swelling in neck in cysts group, 2(15.4%) in sinus group. Opening in neck was not found in cysts group and 13 (100.0%) in sinus group. Discharge from opening in cysts group was 1 (4.3%) and 12 (92.3%) in sinus group. Thyroglossal cysts and sinuses were more common in 2nd decade and male predominant. Swelling in neck was more common presenting complaints in cysts patients, However, opening in neck and discharge from opening were more common in sinuses. Infrahyoid site, oval shape, soft consistency, movement with deglutition and movement with protrusion of tongue were more common in cysts patients. In addition, infrahyoid site, discharge and Tract Palpable were more common in sinuses patients. Majority of the cysts were infrahyoid and on the right side of midline and majority of sinuses were infrahyoid and on the right side. Development of sinuses were due to operation following abscess formation in majority of cases.

Keywords: Thyroglossal Duct Cyst; Thyroglossal Sinus

Introduction

Thyroglossal duct cyst (TDC) is the most common type of developmental cyst encountered in the neck region. It is a condition that results from the failure of obliteration of the thyroglossal duct which forms a bridge between the base of the tongue and the thyroid gland.

The thyroid gland originates from the foramen caecum present in the floor of the pharyngeal gut on the 17th day of gestation. The gland then descends in front of the pharynx as a bilobed diverticulum which is initially patent. It reaches its final position in the neck by the 7th week of gestation. The duct usually disappears by the 10th week of gestation. Since the hyoid bone develops later and joins from lateral to medial the thyroglossal duct may get trapped in the substance of the body of hyoid bone resulting in the tract running inside the body of the bone. The hyoid bone rotates to reach its adult position dragging the duct posteriorly and superiorly at the inferior edge of its body. No natural internal opening of thyroglossal duct has been demonstrated at the level of foramen caecum so far. This has been attributed to the fact that the tongue and foramen caecum forms after the complete descent of the thyroglossal duct. Persistence of any portion of this duct could give rise to thyroglossal cyst.

A review of the literature shows that this developmental abnormality arises in about 7% of the population. Two third of thyroglossal duct anomalies are diagnosed within the first 3 decades of life with more than half being identified before age 10 years (Enepakides, 2001). The most common presentation is that of a painless cystic neck mass near the hyoid bone in the midline. Although they are most commonly found immediately adjacent to the hyoid (66%) they can also be located between the tongue and hyoid (20 to 25%), between the hyoid and pyramidal lobe (25 to 65%), within the tongue or within the thyroid (Perez-Martinez., *et al.* 2005 and Mohan., *et al*. 2005). The mass usually moves with swallowing or protrusion of the tongue. Approximately, one third present with

a concurrent or prior infection which are the more common presentation in adults (Foley and Fallat, 2006). One fourth of patients present with a draining sinus that result from spontaneous drainage or surgical drainage of an abscess. This drainage can result in a foul taste in the mouth if the spontaneous drainage occurs by way of the foramen caecum.

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.

Materials and Methods

A retrospective study was in Sher-e-Bangla Medical College, Barisal from 2011 to 2016. 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 the study population. A detailed history along with examination and thyroid function tests, ultrasonography of neck, X-ray lateral view neck were done. No computed tomography (CT) scans were done as Fine needle aspiration cytology (FNAC) ruled out the lone thyroid tissue and sonography confirmed the normal anatomy of the thyroid. All patients with clinical diagnosis of thyroglossal cysts and sinuses were taken as sample in this study. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 20.0 for Windows (SPSS Inc. Chicago, Illinois, U.S.A.). The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentage.

Results

Table 1 shows demographic profile distribution of the study. 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 ± 11.3 years in cysts group and 15.5 ± 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 2 shows distribution of study patients by presenting complaints. 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 ± 2.8 in cysts group with range from 01 to 11 and 3.7 ± 3.6 in sinus group with rage from 1 to 15.

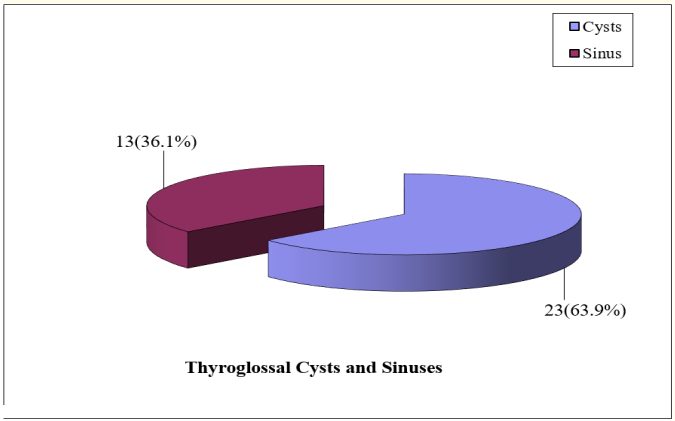

Figure 1: Pie chart shows thyroglossal cysts and sinuses of the study patients.

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 - 40	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 1: Distribution of the study patients by demographic profile (n = 36).

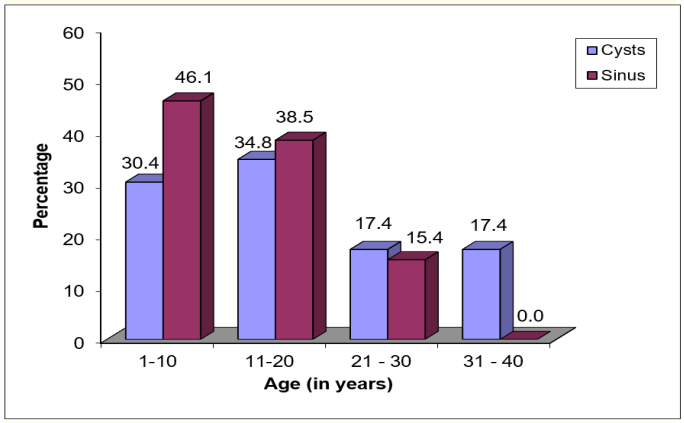

Figure 2: Bar diagram shows age distribution of the study patients.

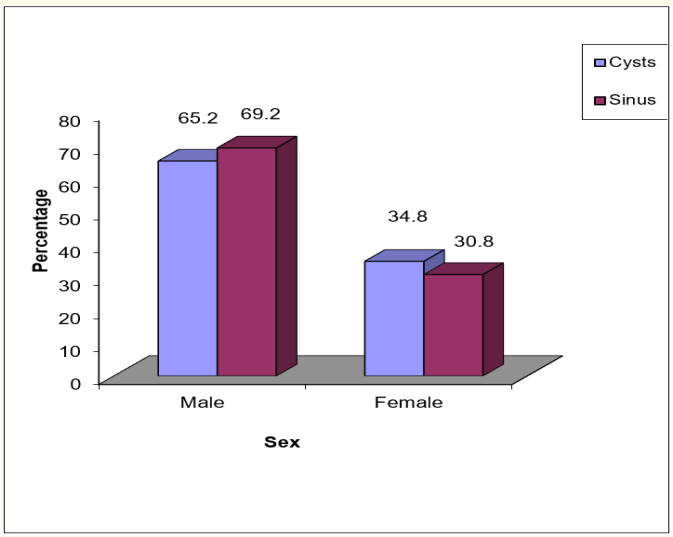

Figure 3: Bar diagram shows sex distribution of the study patients.

Table 3 shows distribution of the study patients by past history. 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.

Table 4 shows site of cysts of the study patients. 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%) were on the left side, 4 (36.4%) on right side and 4 (36.4%). At the level of hyoid, of 8 (34.8%) cysts, 2 (25.0%) were on left side, 3 (37.5%) on right side and 3 (37.5%) in the midline.

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

Table 2: Distribution of the study patients by presenting complaints (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 3: Distribution of the study patients by past history (n = 36).

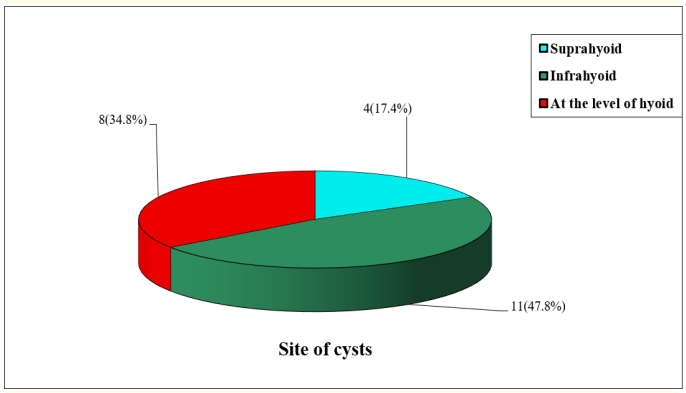

Figure 4: Pie chart shows distribution of cysts according to site of the study patients.

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 4: Distribution of cysts according to site (n = 23).

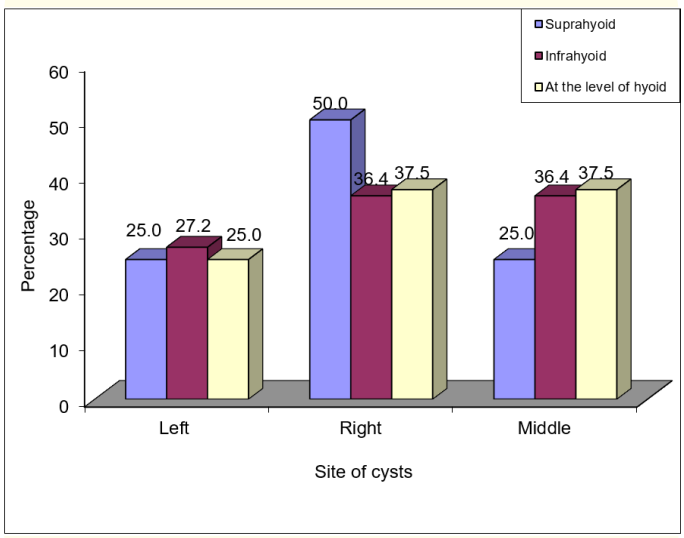

Figure 5: Bar diagram shows distribution of cysts according to site of the study patients.

Table 5 Shows distribution of the study patients in cyst group according to local examination. It was observed that almost three fourth (73.9%) of the cysts were oval in shape. only 4 (17.4%) had raised local temperature, most of them were with normal temperature. Consistency was firm in 7 (30.4%) and soft in 16 (69.6%) patients. Overlying skin conditions were normal in most of the cysts but only 1(4.3%) was red and edematous. Average size of the cyst was 21.1 ± 10.2 mm ranging from 8 to 40 mm.

Local examination in cysts	Number of patients	Percentage
Shape		
Rounded	6	26.1
Oval	17	73.9
Local temperature		
Raised	4	17.4
Normal	19	82.6
Consistency		
Firm	7	30.4
Soft	16	69.6
Overlying skin condition		
Normal	22	95.7
Red and edematous	1	4.3
Movement with Deglutition		
Present	23	100.0
Absent	0	0.0
Movement with protrusion of Tongue		
Present	23	100.0
Absent	0	0.0
	Mean ± SD	Range (min, max)
Size (in mm)	21.1 ± 10.2	8, 40

Table 5: Distribution of the study patients in cysts group according to local examination (n = 23).

Table 6 shows distribution of sinuses according to site. 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 sinuses were found at the level of the hyoid bone and of them 2 (66.7%) were on the right side of midline.

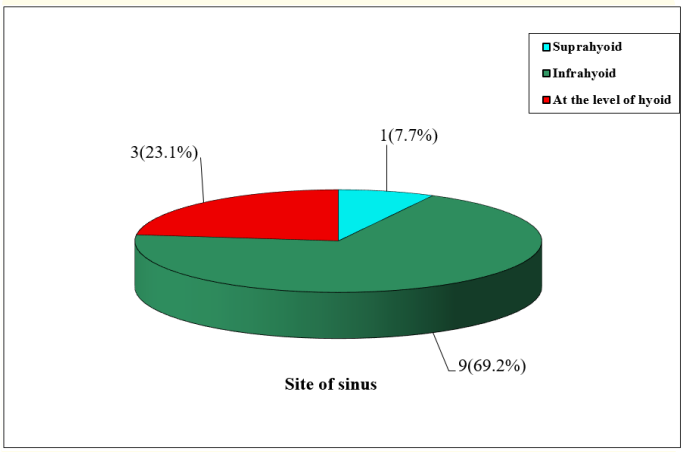

Figure 6: Pie chart shows distribution of sinus according to site of the study patients.

Site in 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 6: Distribution of sinus according to site (n = 13).

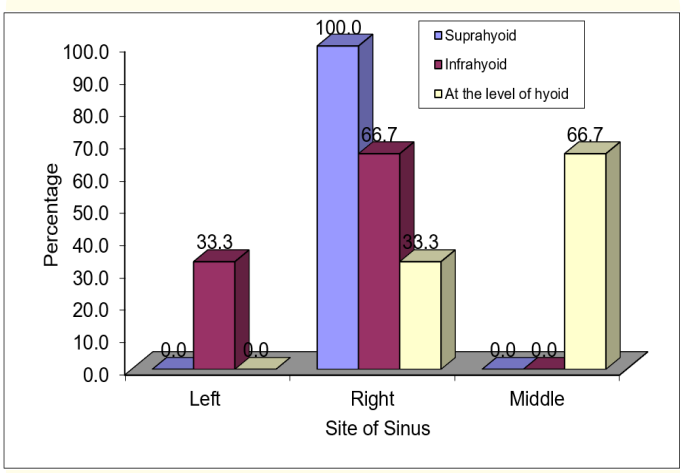

Figure 7: Bar diagram shows site of sinuses of the study patients.

Table 7 shows local examination finding of the sinus patients. It was observed that most of the sinuses had discharge and had palpable tract.

Local examination in sinus	Number of patients	Percentage
Discharge		
Present	12	92.3
Absent	1	7.7
Tract Palpable		
Yes	12	92.3
No	1	7.7

Table 7: Distribution of the study patients by local examination in sinus (n = 13).

Table 8 shows distribution of the patients by investigation. It was observed that all the patients had normal thyroid gland in both groups, all of them had normal serum TSH level. FNAC done in all cyst patients and showed 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.

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

Table 8: Distribution of the study patients by investigation (n = 36).

Discussion

This 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 2011 to February 2016 were included in this study. All midline neck swellings and sinuses, all recurrent cases of thyroglossal cysts and sinuses, all age group and both sexes were enrolled in this study. Patients without midline neck swelling and sinuses and thyroid swellings were excluded from the study. The present study findings were discussed and compared with previously published relevant studies.

Thyroglossal duct cyst (TDC) is the most common type of developmental cyst encountered in the neck region. It was a condition that results from the failure of obliteration of the thyroglossal duct which forms a bridge between the base of the tongue and the thyroid gland (Mondin., *et al*. 2008) showed that this developmental abnormality arises in about 7% of the population. In this present study, it was observed that almost two third (63.9%) patients had Cysts. Tristan., *et al*. (2015) reported that definitive diagnosis of a thyroglossal cyst was made in 89.0% of the patients using ultrasound as the only imaging method. In this current study, it was observed that more than one third (36.1%) of the patients had sinuses. Marshall and Becker (1948) observed 310 cases, out of which 30.0% were sinuses. Most sinuses develop from spontaneous rupture or incision of an abscess resulting from inflammation arising in the cyst.

In this present 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 was found 16.6 ± 11.3 years in cysts group and 15.5 ± 7.2 years in sinus group. Jugmohansingh., *et al*. (2015) found the ages ranged from birth to 51 years old. With respect to age, 2 peaks were noted at 5-10 years and 20-30 years. Below the age of ten, seven people had thyroglossal duct cysts. Within the age group 10-50, 9 patients had cysts. In this series, only one patient developed a cyst over the age of fifty, which was similar with the current study.

In this current 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*. [1] reported that the incidence of Sinus is higher in males than in females, which were comparable with the current study. In another study Tristan., *et al*. (2015) found male to female ratio was 1:1. On the other hand Mikac and Biukovic (2016) found the male to female ratio was 1:1.17. Similarly, female predominant also observed by Jugmohan singh., *et al*. (2015) and Choi., *et al*. [2]. Moreover, it was observed that almost two third (60.9%) patients were middle class socioeconomic status in cysts group and 61.5% in sinus group.

The ductal cyst often presents as a painless, cystic, mobile, fluctuant and midline swelling of the neck. The inflammation associated with infections could have increased secretions of the epithelium within the thyroglossal duct producing an obvious cystic swelling in the neck (Shah., *et al*. 2007 and Shvili., *et al*. 2009). Within the subgroup of midline cysts, the thyrohyoid level was the most common location (Simon., *et al*. 2012, Shah., *et al*. 2007 and Ghaneim and Atkins 1996). Tristan., *et al*. (2015) observed 99.0% patients had Swelling in cysts, and 81.0% patients had sinuses. Moorthy and Arcot (2011) noted that a typical presentation of painless, cystic swelling was found only in about 41.6% of the patients diagnosed of TDC. Thyroglossal duct cyst commonly presents as painless midline neck swelling [3] and most frequently found below the level of the hyoid bone 85% [4].

Tristan., *et al*. (2015) found 90.0% were associated with opening of the cyst during the first operation, and 20.0% patients had no excision of the central part of the hyoid bone. The most common midline congenital neck cyst is thyroglossal (TG) cyst; (Mondin., *et al*. 2008 and Shah., *et al*. 2007) it arises from remnants of the embryonic TG duct from the base of the tongue to the thyroid isthmus (Hirshoren., *et al*. 2009 and Myer and Cotton 1990). They were mostly asymptomatic but may also present with pain, difficulty in breathing or swallowing, neck discomfort. If they were not excised, then they would eventually become the site of recurrent infection, fistula, and even a carcinoma. Sistrunk surgery has been considered as the treatment of choice for this condition (Hirshoren., *et al*. 2009 and Perkins., *et al*. 2006). In another study 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. Thompson., *et al*. (2016) found the mean duration was 46 months with ranged from 0.1–136 months. In this current 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 not found in cysts group, 46.2% in sinus group.

The most common clinical presentation of TDC was a median neck mass, which was painless and tends to grow slowly over time [5]. Approximately one third present with a concurrent or prior infection, which were common presentation in adults (Pounds, 1981). One fourth of patients was present with a draining sinus that result from spontaneous drainage or surgical drainage of an abscess (Pounds, 1981).

Mikac and Biukovic (2016) mentioned in their study that Thyroglossal duct cyst was typically located in the median line of the anterior side of the neck, below the hyoid bone. Although results vary, studies show that 40% of TDC lie outside the midline i.e. laterally to the supposed medial line in adult population. When it came to the height, over 82.0% of TDC were located at the infrahyoid muscles and only 5% at the suprahyoid ones [6]. In this study a total of 4 cases was suprahyoid, out of which 25.0% in left site, 50.0% in right and 25.0% in midline. Jugmohan singh., *et al*. (2015) mentioned that symptomatic patients 65.0% (unique description of an infected right lateral thyroglossal duct cyst with suprahyoid, anterior hyoid and infrahyoid components), location: midline 71.0% and right lateral 29.0% with no left lateral cases.

In this current study Infrahyoid cysts observed in 11(47.8%) cases, among them 27.3% in left site, 36.4% in right and 36.4% in midline. Thompson., *et al*. (2016) study found 76.0% TGDC were infrahyoid. Kutuya, and Kurosaki, 2008; Sidell, and Shapiro, 2011 and Lima, and Liapis, 1987, demonstrated mixed results, with some localizing 61.0% of TGDC at or above the hyoid bone and others identifying the hyoid bone and Infrahyoid region to be the most common site for TGDC. Pounds, (1981) reported that 15 to 50% TDCs occur at the level of the hyoid. Similarly, Kutuya and Kurosaki (2008) found 38.9% were Infrahyoid.

In this study, 8 cases were found at the level of hyoid, among them 25.0% in left site, 37.5% in right and 37.5% in midline. Pounds (1981) previously reported that 25 to 65% TDCs were in the Infrahyoid neck. Calabro and Lieberman (2014) found the location in the midline or paramedian, 65% Infrahyoid, 20% suprahyoid and 15% at the level of hyoid bone. Gandhi., *et al*. (2011) mentioned that the most common congenital anomaly related to thyroglossal duct was the thyroglossal duct cyst (TDC) located in the region of the hyoid bone. About 15 to 50% were at the level of hyoid bone, 20 to 25% are suprahyoid, and 25 to 65% are infrahyoid (Pounds, 1981). No gender predilection had been reported, and the age of the affected patient ranges from birth to 70 years; approximately 50% of patients present before the age of 20 years (Maran, 1997). The cyst could lie anywhere within the thyroglossal tract, from the base of the tongue to the suprasternal region. About 90% of thyroglossal duct cysts laid at or very close to midline (Maran, 1997). Approximately 1.0% of the cysts was located laterally, often on the left side (Soliman and Lee, 2006).

Tristan., *et al*. (2015) found 66.0% firm in their study patients. Benign thyroglossal duct cysts usually present as asymptomatic, soft, firm, or hard masses in the midline of the anterior neck, and are nontender and generally movable. In this study it was observed that average size of the cyst was 21.1 ± 10.2 mm ranging from 8 to 40 mm. Suraneni and Amara (2016) mentioned that the site of the cyst was infrahyoid in 9 cases and suprahyoid in 1 case. Clinically, 8 cases (80%) showed classical midline cystic presentation and in two cases (20%), the cysts were present in lateral neck up to the level of sternocleidomastoid muscle and movement with deglutition and protrusion of tongue was not appreciated.

Fine needle aspiration cytology (FNAC) and ultrasonography neck were suggestive of TG cyst. Thyroid profile was normal. The patient underwent Sistrunk's procedure and post of histopathological examination of the specimen was confirmative of TG cyst without any evidence of malignancy. The patient's postoperative period was uneventful. FNAC was diagnostic and ultrasound neck should be performed to detect the presence of normal positioned thyroid gland [7].

The location was in the midline or paramedian and was closely related to the hyoid bone (Friedman and John 2011 and Mirilas 2011). The incidence of ectopic thyroid tissue within the cyst wall has ranged from 0.5% to 5.7% (Saiki, 1967 and Noyek and Friedberg, 1981). In this study, it was observed that all the thyroid glands were in normal position. No ectopic thyroid noted in relation to the thyroglossal cysts and sinuses [8-19].

Conclusion

This study was undertaken to see the presentation of thyroglossal cysts and sinuses. Thyroglossal cysts and sinuses were more frequent in second decade, male predominant and most of the patients came from middle income and lower income family. Swelling in the neck was the most common presenting complaints, however, discharging sinuses. Majority of the sinuses had history of pain, abscess formation and history of operation. All the patients had normal thyroid gland. Majority of the cysts were infrahyoid and on the right side of the midline. Majority of the sinuses were also infrahyoid and on the right side. Development of sinuses were due to operation following abscess formation in majority of cases.

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Volume 3 Issue 3 March 2019