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Original Research Article

Clinicopathologic Study of Thyroglossal Duct Cyst: An Institutional Experience

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Abstract: ***Background:*** Thyroglossal duct (TGD) is a developmental anomaly in which a remnant of the thyroid anlage is left in the neck throughout its descent from the foramen cecum of tongue to ultimate peritracheal position. A persistent duct can lead to thyroglossal duct cyst (TGDC). Histologically, TGDC brings an epithelial lining of squamous or pseudostratified ciliated columnar epithelium and ectopic thyroid gland tissue in the duct wall. TGD-associated malignancy is rare, and the majority is papillary thyroid carcinoma (PTC). ***Objectives:*** The aim of the study is to assess the **c**linicopathologic features of thyroglossal duct cyst. ***Methods:*** This is an observational study. The study was carried out among the admitted patients of National Institute of ENT, Dhaka, Bangladesh from January 2019 to September 2022. Statistical analysis of the data was carried out using SPSS-24. ***Results:*** This study shows that according to age distribution, 30(58.8%) were <20, 8(15.7%) were 21-30, 10(19.6%) were 31-40, 2(3.9%) were 41-50, none in the 51-60 and 1(2.0%) was ≥61 years age group. And according to gender (47.1%) were Male and (52.9%) were Female. According to diagnosis, 45(88.2%) were Thyroglossal Duct Cyst, 1(2%) was multinodular goiter and 5(9.8%) were Papillary thyroid carcinoma. ***Conclusion:*** TGDCs are common pathologic lesion affecting the neck. Thyroglossal duct cyst carcinomas, most commonly papillary thyroid carcinoma, is a rare condition that should be considered in patients presenting with cystic midline neck masses. Surgery is the main treatment and multidisciplinary consultation is required to improve survival. The diagnosis of malignancy is made postoperatively.

Keywords: Thyroglossal duct (TGD); Thyroid anlage; Foramen cecum; Epithelial lining; Ectopic thyroid gland tissue.

INTRODUCTION

Thyroglossal duct (TGD) is a developmental anomaly in which a remnant of the thyroid anlage is left in the neck all through its descent from the foramen cecum of tongue towards the first and second tracheal rings [1-3]. A failure of thyroglossal duct involution is estimated to manifest in 7 % of the adult population [4]. A persistent duct can lead to a cervical cyst, i.e., thyroglossal duct cyst (TGDC), the most frequent congenital abnormality in the neck [5]. The TGDC normally presents as painless lesion in the midline of the neck. Indications for excision include cosmetic reason, recurrent infection, sinus or fistula formation, and malignancy. The surgical intervention is carried out by performing the Sistrunk procedure; this consists of excision of the cyst, the middle part of the hyoid bone and surrounding tissue of the duct. Histologically, thyroglossal duct cysts comprise an epithelial lining of squamous or pseudostratified ciliated columnar epithelium and ectopic thyroid gland tissue; the latter is typically located in the duct wall [6]. Rarely,

malignancy from a TGDC may develop with an incidence of <1%. Most of these are papillary thyroid carcinomas with a presentation similar to that of the thyroglossal cyst [7].

Two anatomic caveats want to be regarded earlier than rendering an analysis of TGD-associated PTC: (1) Approximately half of thyroid glands exhibit a pyramidal lobe, which is the remnant of the inferior component of the TGD. The pyramidal lobe extends superiorly from the isthmus and may also be attached to the hyoid bone by way of fibrous tissue. (2) Delphian node is a midline prelaryngeal lymph node placed anterior to the cricothyroid membrane, which is the most frequent site of lymph node metastasis in PTC [8]. Since metastatic papillary thyroid carcinoma can regularly present as a cystic lesion, a carcinomatous cyst positioned at the midline of neck is no longer constantly a TGD related PTC. Both pyramidal lobe PTC and Delphian node metastasis show thyroid carcinoma springing up in the thyroid gland, which is treated differently compared to TGD-associated PTC [9].

The thyroglossal duct represents the embryological path of the thyroid's caudal descent from the foramen cecum of the tongue base to the top of trachea. This is commonly completed by way of eight weeks gestation, and involution of the duct will appear between the eighth and tenth week [10]. Failure of duct involution consequences in a possible cystic space which may also swell or turn out to be contaminated later in life. Thyroglossal duct cysts (TGDC) account for the majority of pediatric congenital neck masses, and is second to lymphadenopathy overall [11]. The preliminary presentation is commonly an asymptomatic, enlarging, midline neck mass, however contamination is additionally no longer uncommon. TGDCs can occur somewhere alongside the route of the thyroglossal duct tract inclusive of the tongue base [12]. Ultrasound or Computed Tomography (CT) is normally recommended to differentiate TGDC from different reasons of midline neck mass such as dermoid cyst or lymph node, and can additionally decide the presence and area of normal thyroid tissue. In pediatric patients, CT is commonly averted to restrict radiation exposure, although can be useful in figuring out the presence of associated abscess. Infected TGDC are generally handled with oral antibiotics [13]. There are conflicting views on the guide of surgical incision and drainage (I&D) in the context of a contaminated TGDC. Simon and Magit determined no distinction in recurrence when utilizing I&D versus the use of antibiotics alone. This contradicts the long-held trust that scarring can obscure tissue planes hindering future excision [14]. Regardless, open surgical excision through Sistrunk's manner is the gold standard for definitive intervention and multiple studies have shown decreased recurrence over simple excision. Additional elements influencing recurrence consist of intraoperative cyst rupture, arborization of sinus tracts, and latest TGDC contamination [15].

METHODS

This is an observational study. The study was carried out in the Department of Histopathology, National Institute of Ear, Nose and Throat (ENT), Dhaka, Bangladesh. The duration of the study period was from January 2019 to September 2022. A total of 51 patients including both male and female, with a pre-operative diagnosis of TDC were included in the study. Formalin fixed specimens were routinely processed and paraffin embedded sections were stained with hematoxylin and eosin. The data for this study were collected from patients' medical information, ultrasonography and FNA cytology. Statistical analysis was carried out using the software program Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table I: Distribution of the study according to age

Age Distribution	n=51	%
<20	30	58.8
21-30	8	15.7
31-40	10	19.6
41-50	2	3.9
51-60	0	0.0
≥61	1	2.0
Mean±SD		20.26±13.58
Min-Max		2-65

Table I demonstrated the age of 51 Patients, aged <20 to ≥ 61 years. Accordingly, 30(58.8%) were <20, 8(15.7%) were 21-30, 10(19.6%) were 31-40, 2(3.9%) were 41-50, 0(0.0%) was 51-60 and 1(2.0%) was ≥61.

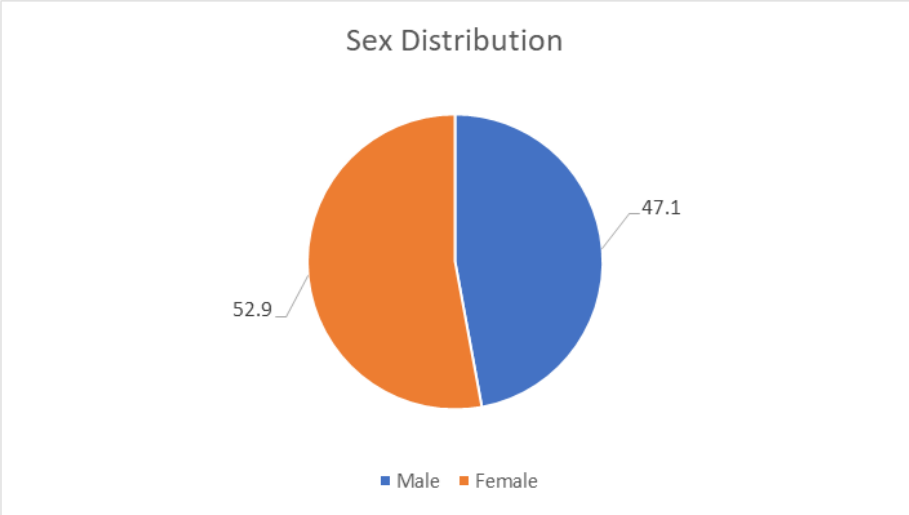

Figure I: Distribution of the study population according to sex

The total study population was 51 patients, according to gender (47.1%) were Male, (52.9%) were Female.

Table II: Distribution of the study population according to histopathological diagnosis

Diagnosis	n=51	%
Thyroglossal Duct Cyst	45	88.2
Multinodular goiter	1	2
Papillary thyroid carcinoma	5	9.8

Table II demonstrated the distribution of the study population according to diagnosis. Here according to diagnosis, 45(88.2%) were Thyroglossal Duct Cyst, 1(2%) was multinodular goiter and 5(9.8%) were Papillary thyroid carcinoma.

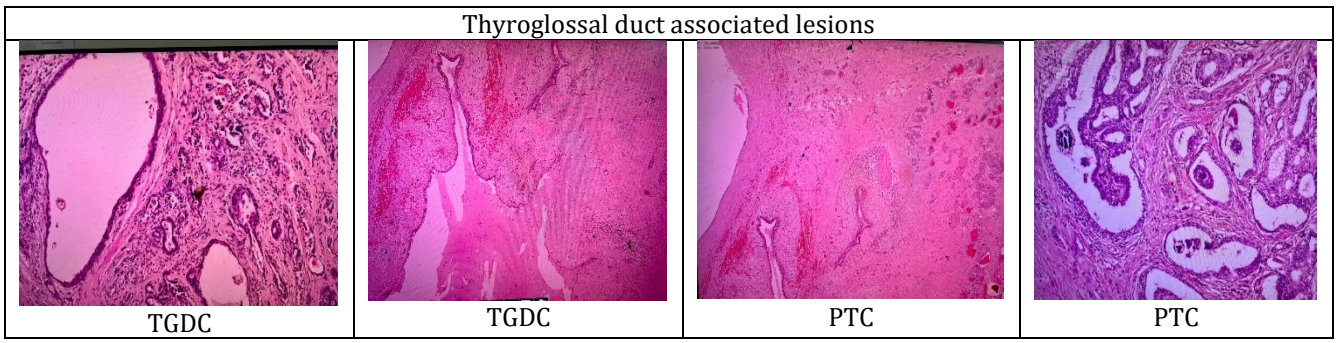

Figure II: Different types of thyroglossal duct associated lesions

DISCUSSION

TGDCs are among the most common pathologic lesions affecting the neck. Carcinomas arising from the TGDCs are rare. Due to their rarity, there have been few large series of TGDC carcinomas reported in the literature. In our study, 9.8% of TGDCs contained an associated carcinoma. As these cases were identified among all TGDCs during a consecutive three years period without referral or any bias, this observed rate may be more reflective of the true incidence of thyroglossal duct cyst carcinomas.

In our study, TGDC carcinomas affected women more frequently than men with a 4:1 female to male ratio. The youngest patient was 15 years of age and the eldest one was of 45 years. Most patients presented with a midline neck mass, clinically indistinguishable from benign TGDC. Thyroglossal duct cyst carcinomas are thus difficult to identify preoperatively, with the majority diagnosed after pathologic evaluation of the excised specimen. In this study, according to diagnosis, 45(88.2%) were Thyroglossal Duct Cyst, 1(2%) was Multinodular goiter and 5(9.8%) were Papillary thyroid carcinoma.

A diagnosis of a primary TGDC carcinoma requires the histologic demonstration of an associated thyroglossal duct remnant lined by respiratory epithelium, squamous epithelium, or a combination of both. Identification of ectopic thyroid tissue further confirms the diagnosis [16, 17]. All tumours in the present study were associated with cystic remnants of the thyroglossal duct identified histologically along with foci of ectopic thyroid gland tissue, supporting classification of these cases as primary thyroglossal duct cyst carcinomas.

CONCLUSION

TGDCs are common pathologic lesion affecting the neck. Thyroglossal duct cyst carcinomas, most commonly papillary thyroid carcinoma, is a rare condition that should be considered in patients presenting with cystic midline neck masses. Surgery is the main treatment and multidisciplinary consultation is required to improve survival. The diagnosis of malignancy is made postoperatively.

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