CASE REPORT

https://doi.org/10.3329/jmcwh.v22i2.90244

PAPILLARY CARCINOMA OF THYROID ARISING IN A THYROGLOSSALDUCT CYST- REPORT OF A CASE

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Received: 30.03.2026
Accepted: 09.06.2026
Published: July 2026

Cite this article:
Razzaque S, Choudhury T, Shumon AM, Sharmin R, Ghosh S. Papillary carcinoma of thyroid arising in a thyroglossalduct cyst-report of a case. J Med Coll Women Hosp. 2026; 22(2):243-247.

ABSTRACT

Papillary thyroid carcinoma arising within a thyroglossal duct cyst is uncommon and has an excellent prognosis. Diagnosis can be established by microscopic examination of the specimen after excision. Here, we are reporting a papillary thyroid carcinoma with in a thyroglossal duct cyst, in a female of 40 years of age. She had a midline swelling in the neck, situated anteriorly for about a year. Clinically, it was diagnosed as a thyroglossal duct cyst. Cytopathological examination was performed by fine needle aspiration which commented in favorof papillary thyroid carcinoma within a thyroglossal duct cyst. Excision was performed bythe Sistrunk procedure and histopathology finalized the diagnosis as papillary thyroid carcinoma within thyroglossal duct cyst.

Keywords: Thyroglossal duct cyst, Papillary thyroid carcinoma, Sistrunk procedure, Histopathology.

INTRODUCTION

Thyroglossal duct (TGD) represents the most frequent clinically significant congenital anomaly related to the thyroid gland, reported in approximately 7% of the adult population.The thyroglossal duct is an embryologic structure which is formed when the primitive thyroid gland descends from the foramen cecum of the tongue to its normal pretracheal location.Under normal embryologic development, the duct undergoes involution between the eighth and tenth weeks of gestation,but incomplete regression can result in persistent remnants, like ectopic rest of thyroid tissue, as a cyst or as a duct. The most common (60%-65%) location for TGD is in between the hyoid bone and the thyroid gland. Next is the suprahyoid region in 24%, suprasternal in 13%, and 2% in intralingual locations[1-4].

Thyroglossal duct carcinoma (TGDC) are exceedingly rare, malignant transformation is detected in about 1% of congenital remnants of TGD [2,3].The first documented case of TGDC was in 1911[5], and there after about only 300 cases are found in the literature, either as an isolated case report or as small series of cases[2,6,7]. Among the histologic variants, papillary carcinoma constitutes the predominant subtype, representing the majority (approximately 80%–90%) of all reported cases[8].

Clinically, papillary carcinoma within a TGD often mimics a benign thyroglossal cyst. To differentiate between a benign thyroglossal duct cyst and a malignant lesion before excision remains challenging because patients typically present with a midline neck swelling characteristically moving with both swallowing and tongue protrusion. The standard imaging modalities or fine-needle aspiration cytology (FNAC) may not be able to detect malignancy in all cases[9]. As a result, a definitive diagnosis is frequently made postoperatively on histopathological examination of the excised specimen[3,6]. Here, we are reporting a case of papillary thyroid carcinoma (PTC) within a thyroglossal duct cyst.

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CASE REPORT

A 40-year-old female reported to the Otolaryngology outpatient department (OPD) of Medical College for Women and Hospital (MCWH), Dhaka in the month of January 2026 with a swelling in the median line of the anterior neck**.** The swelling was noticed for one year, with pain during swallowing and difficulty in breathing for the pastthree months but there was no voice change. She also complained of palpitation for about one and a half year.She had no significant family history or past history of medical illnessn or any history of radiation exposure.

The patient was examined physically in the OPD. She appeared to be slightly ill. She had average body build and was anemic. A midline neck swelling was noted in the region of the hyoid bone about 4x3 cm in size, globular in shape, non tender and was firm to hard in consistency. The swelling moved up with deglutition and tongue protrusion. No cervical lymph nodes were palpable. All her vitals (body temperature, blood pressure, pulse rate) were within normal range. On laboratory investigations her hemoglobin was 11.5gm/dl, however, other parameters ofcomplete blood count (CBC), random blood sugar (RBS), serum creatinine, serum calcium, thyroid stimulating hormone (TSH) all were within normal limits. Chest X- ray and fibreoptic laryngoscopy (FOL) findings were also normal.

Ultrasonography (USG) of the neck revealed both the lobes of thyroid gland and isthmus normal in size with homogenous parenchymal architecture. However, a hypoechoic non homogenous area including a cystic area (3.13x2.50cm) containing granular debris and septations within the cyst was noted above the hyoid bone. USG commented as suggestive of thyroglossal duct cyst.

Cytological examination was done by fine-needle aspiration (FNA) showed features suggestive of papillary thyroid carcinoma arising within a thyroglossal duct cyst**.** Histopathological evaluation was recommended.

The patient was hospitalized in the Otolaryngology department of MCWH and underwent surgery with a Sistrunk procedure (SP)**.** The cyst was dissected with central portion of hyoid bone and core of tongue tissue. The excised surgical specimen was sent to the histopathology laboratory of MCWH.

In the histopathology laboratory the specimen was examined grossly, and it consisted of an oval piece of tissue measuring 5.5 × 2.8 × 2.2 cm. On cut section, with bony tissue, a solid growth measuring 2.9cm in maximum diameter wasnoted. Outer surface was marked by black ink (Figure 1, 2). Eleven representative sections were submitted for processing for histopathological examination.

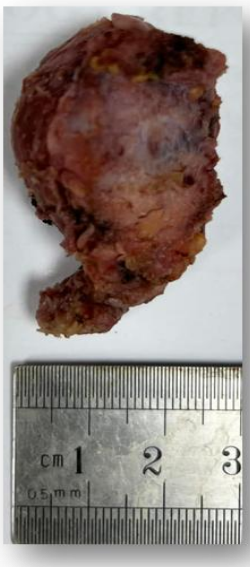


Figure 1: The excided Specimen

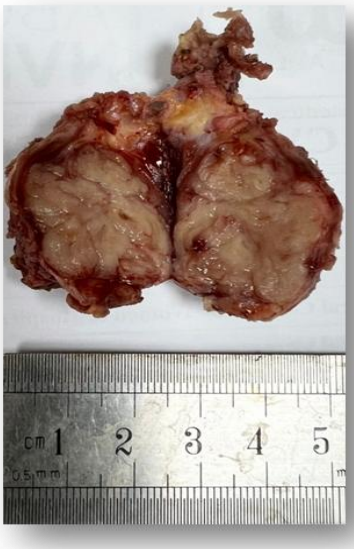


Figure 2: Cut section showing the growth

Microscopy showed a cyst wall lined by flattened to cuboidal epithelium. The wall was composed of fibro-collagenous tissue containing few thyroid follicular cells. A malignant tumor having classical features of PTC, including papillary architecture, fibrovascular cores, nuclear overlapping, ground glass nuclei, nuclear grooving, with occasional intranuclear cytoplasmic pseudo-inclusions were seen within the cyst wall. All these findings confirmed the diagnosis of PTC arising within a thyroglossal duct cyst**.** (Figure 3,4,5). Sections also revealed presence of lympho-vascular invasion. The surgical resection margins, the adjacent soft tissue, muscle and also the hyoid bone all were free of tumor. The pathologic TNM staging was done and according to AJCC (8th edition) criteria for thyroid carcinoma size categories, the tumor size corresponded to pT2[10].

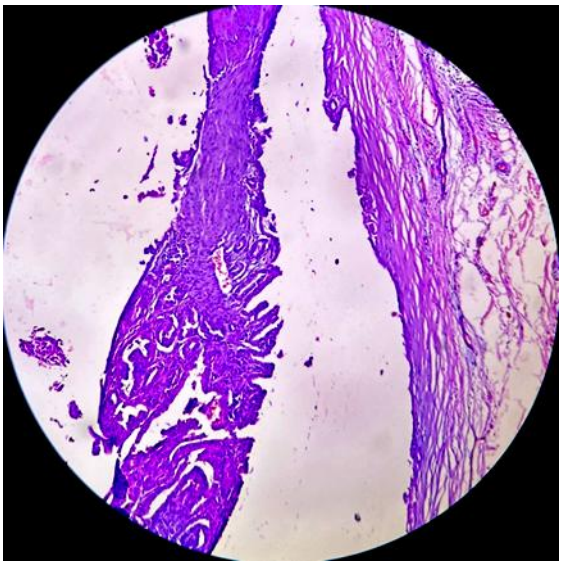
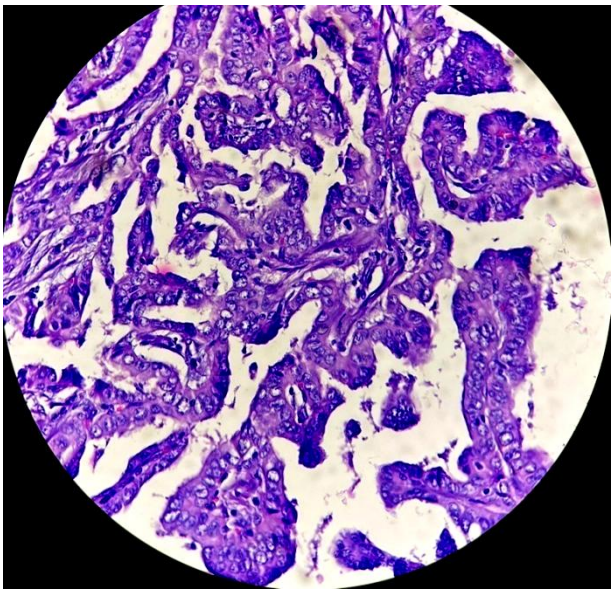


Figure 3: **Microscopic features showing papillary carcinoma of thyroid within a thyroglossal duct cyst Hematoxylin and Eosin (H&E) X 100**



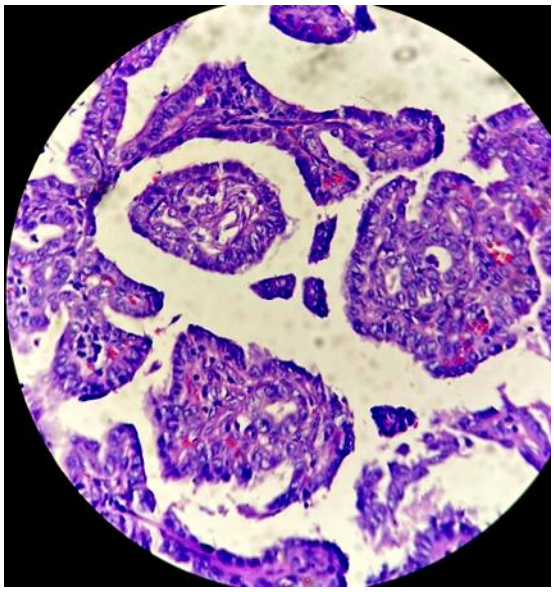


Figure 4 and 5: Microscopic features showing papillary carcinoma of thyroid Hematoxylin and Eosin (H&E) X 100

The postoperative period was uneventful. The patient recovered well and was released from the hospital with relevant advice and scheduled follow-up.

DISCUSSION

The embryologic basis lies in remnants of the thyroglossal tract, which normally involutes as the thyroid gland starts descending from the foramen cecum to its final pretracheal position. Persistent duct remnants can give rise to cysts and, in rare circumstances, neoplastic transformation within ectopic thyroid tissue[11].

PTC arising within a TGD is an uncommon clinical entity. The most frequent congenital midline neck masses include thyroglossal duct cysts. However, malignant transformation is uncommon, reported in approximately 1% of thyroglossal duct cysts, with papillary carcinoma being the predominant histologic subtype described in the literature[2,3,6,9]. Other histologic types are mixed pattern of follicular and papillary carcinomas (8%) and in 6% cases squamous cell carcinoma[3,6]. In our case the patient was diagnosed as PTC.

TGDC may occur in individuals with an age range of 1 yearto 82 years. Most commonly it occurs in fourth decade of life and **f**emales show a higher incidence rate than males[3,4,6]. In this case the patient was a 40 year old female and fits into this demography. Clinically, papillary carcinoma in TGD often mimics a benign cystic lesion. Patients typically present with a painless midline neck swelling, frequently without symptoms indicative of malignant behavior. In the present case the patient reported to the OPD of the hospital with the complaints of midline neck swelling with pain during swallowing and difficulty in breathing.

The role of FNA as a preoperative diagnostic tool is controversial. In FNA the diagnostic yield may be variable as the lesion is cystic in nature and sampling challenges[4,7]. However, in our case, FNA cytology examination successfully suggested malignancy preoperatively.

Histopathologic confirmation remains the gold standard. Diagnostic criteria include identification of characteristic histological features of papillary carcinoma such as papillary structureshaving fibrovascular cores and typical nuclear changes (clearing, grooves, and intranuclear inclusions)[9]. In this reported case all the features of PTC were present on histopathological examination.

Surgical excision with a SP was performed that **is** removal of the cyst along with the mid-portion of the hyoid bone and associated duct tractis regarded as the standard surgical approach for TGDC and offers effective management of most carcinomas confined to the cyst[12]. In our case there were no neck node metastases. The role of routine total thyroidectomy remains controversial and is generally done in patients with concurrent thyroid nodules, suspicious findings on imaging, larger tumors, cervical lymphadenopathy, or risk factors for synchronous thyroid carcinoma[13].

Prognosis for papillary carcinoma arising in TGDC is favorable, with low rates of recurrence and mortality when appropriately treated and most patients remain disease-free at long-term follow-up[3,4,6,12]. However, clinical vigilance is essential given the potential for synchronous thyroid involvement or regional metastasis, particularly in older patients and those with higher-risk histologic features.

CONCLUSION

The most common congenital anomaly of thyroid gland is thyroglossal duct cyst. Occurrence of PTC in TGD cyst is very rare. Nevertheless it has an excellent prognosis if properly diagnosed by histopathology and managed successfully by cyst removal by SP with careful follow up of the patient.

CONFLICT OF INTEREST

There is no conflict of interest.

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