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CASE REPORT

# METASTATIC PAPILLARY THYROID CARCINOMA IN A BRANCHIAL CYST – CASE REPORT

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## ABSTRACT

A rare case of metastatic papillary thyroid carcinoma, incidentally, found within a branchial cyst was reported in a teaching hospital, Kalutara, Sri-Lanka. A 37-year-old female presented with left side lateral neck lump of 4 years duration. Physical examination revealed a solitary, palpable, painless movable neck lump. Both ultrasound scan and fine needle aspiration cytology were suggestive of a branchial cyst. Excisional biopsy revealed that it was a papillary thyroid carcinoma metastatic to/ arising from a branchial cyst. Thyroid Fine needle aspiration biopsy confirmed a left thyroid nodule with suspicious smears (Thy 4/Bethesda). Patient underwent total thyroidectomy histopathology confirmed presence of Papillary Thyroid carcinoma.

Branchial cysts are the most common lateral neck masses. Although it is a benign lesion, rarely, it is possible to find unexpected malignancy within it. During the diagnostic phase, it should be kept in mind that this could be a metastatic lesion from a distant primary or an occult thyroid primary cancer within the branchial cyst. A thorough investigation would help identification of such malignancy and early intervention gives less trouble to both patient and clinician.

***Keywords:*** Papillary; Thyroid carcinoma; Branchial cyst

## 1.INTRODUCTION

Branchial anomalies are among the commonly encountered congenital neck masses and can present as cysts, sinuses or fistulae. They have no predilection to a gender and are usually presented in the first decade of life[1]. Branchial cysts (BC) can rarely harbor malignant tissue in it, either originating de novo from the cyst or that which metastasized from elsewhere[2]. Papillary thyroid carcinoma (PTC) is the most common epithelial malignancy of thyroid tissue and can frequently cause cystic metastasis in the neck[3]. Incidence of PTCs metastasing into BC are rare in literature[4]. Diagnosis of PTC in BC is usually incidental on post excision histology and distinguishing between metastatic PTC and PTC originating from ectopic thyroid tissue within BC can be difficult [5]. This case report presents a case of PTC metastasizing into a BC. This report also serves to highlight the dilemma in precise diagnosis associated with PTC within BC.

### Case report

A 37-year-old, otherwise healthy female presented to the Oral and Maxillofacial Surgical unit, for the management of a left side lateral neck mass (Fig 1).

Figure 1. Pre-operative radiograph of lateral neck mass

It initially appeared 4 years back and has increased in size gradually. She did not report any episodes of pain or dysphagia or constitutional symptoms such as fever, anorexia and weight loss. On examination she was generally fit and well. There was a smooth, circumscribed, non-tender fluctuant cyst on the anterior border of left sterno-cleido mastoid muscle measuring 3 x 3 cm. No palpable lymph nodes were noted. The examination of all other systems were unremarkable.

Assessment of the lump with Ultrasound (US) scan revealed a cystic lesion in the left side neck favouring a BC. A left sided solitary thyroid nodule with thyroiditis was also incidentally reported. Fine needle aspiration cytology (FNAC) of the cystic fluid showed cytological features of a benign cystic lesion. Further radiological assessment with contrast enhanced CT scan revealed the presence of 3.2cm x 2.2cm septated cystic lesion in left submandibular region with calcific foci medially, compatible with a BC (Fig 2 and 3).


Figure 2. Cystic lesion in the left lateral neck in a Coronal section CT with contrast infusion.

Complete surgical excision of the cyst with its track was done under general anaesthesia and the histological examination reported PTC metastatic to or arising from the BC (Fig 4).

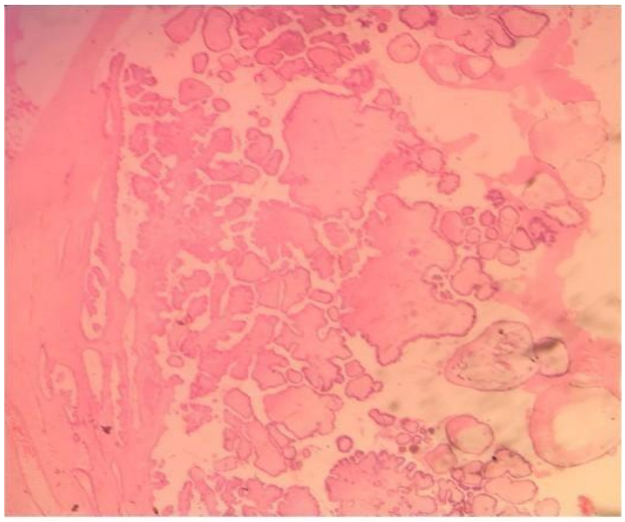

Figure 4. Branchial cyst wall with papillary thyroid carcinoma growth (H and E)

Immune-histochemical analysis of the specimen revealed the neoplastic cells to be staining positive for Thyroid Transcription Factor (TTF-1).

US guided FNAC of the solitary thyroid nodule revealed suspicious lesion (Bethesda Thy4). Thyroid functional tests were in normal range. Total thyroidectomy and ipsilateral selective neck dissection was subsequently performed and the growth of an unencapsulated classical PTC in thyroid gland was confirmed by histology. The patient was then treated with radioactive iodine therapy at the oncology clinic and is disease free for 2 years in follow up.

## DISCUSSION

BC are embryological remnants in the neck that are lined by squamous epithelium with frequent presence of lymphoid tissue within[1]. The aetiology of BC is not universally agreed upon. The most accepted theory is the incomplete involution of embryonic pharyngeal clefts, thus the name BC. However, recent theories suggest the formation of BC to cystic degeneration of cervical lymph node triggered by epithelial inclusions from aero- digestive tract and glandular tissue [6,7]. While BC often remain asymptomatic, it can present as a swelling in the lateral neck, usually secondary to filling of the potential cystic space as a result of inflammation [1,2]. Surgical excision remains the standard treatment option for the management of BC [2]. However newer studies show sclerotherapy to be safe and effective in certain cases [8]. Rarely, the cystic mass could also harbour neoplastic tissue metastasizing from elsewhere, with squamous cell carcinoma being the commonest malignancy to be found in it [4]. A retrospective review in a single institution found that out of twenty-eight patients who underwent excision of branchial cysts,[3] was subsequently found to have malignant tissue in it [9]. BC are usually diagnosed in the first decade of life, but presentation in adults is not uncommon. When presenting later in life, the possibility of malignancy should always be considered at the top of the differential [2]. Other probable causes presenting as lateral cystic neck

masses should also be kept in mind even though the diagnosis of BC is made pre-operatively. In a 10-year retrospective study, 14 out 99 patients who underwent surgery for BC were found to have other causes which were missed during the initial assessments [2]. Some of these were cysts with caseous necrosis, metastatic node with cystic changes, cysts of submandibular gland, Warthin tumour, etc.

The presence of PTC in BC is rare in literature and seldom diagnosed pre-operatively. US scan and FNAC remain the first line of work-up in neck masses. Presence of solid components, dystrophic calcifications, being ill-defined and thick walled in US scan raises alarm for the possibility of the cyst to contain neoplastic tissue [10,11]. Thyroglobulin levels in the fine needle aspirate can be a better diagnostic tool than cytology alone in suspected PTC metastasis[12]. But the use of which is unwarranted except in the case of established thyroid malignancy. Use of thyroid functional tests is extremely limited due to majority of patients with PTC having normal thyroid function. It is suggested that the US imaging is to be accompanied by either computed tomography (CT) or magnetic resonance imaging (MRI), especially in older population presenting with cystic mass in lateral neck [9]. Presence of septations, heterogeneous attenuation and extracapsular spread are features suggestive of malignancy in CT [9].

Differentiating PTC that has metastasized to the BC from PTC arising from ectopic thyroid tissue remnant of BC can be challenging [13,14]. Features confirming the latter are the presence of normal ectopic thyroid tissue within the cyst and the exclusion of PTC in the thyroid gland after meticulous histological examination [5]. Immuno-histochemical markers for thyroid tissue such as thyroglobulin and TTF-1 are useful in revealing the origin of undifferentiated tissue to thyroid tissue but fail to distinguish between the normal thyroid and ectopic thyroid tissues found elsewhere. Thus, primary PTC arising from BC are extremely rare and are limited to few case reports[6,10,13,14].

Once the presence of PTC is found in the BC, a total thyroidectomy is recommended and selective neck dissection should be considered even in the absence of suspicious nodules by US scan and FNAC[4,6]. Adjuvant radioactive iodine is effective in the case of residual thyroid tissue or malignancy is suspected[6].

Despite frequently having regional metastasis at the initial presentation, PTC has better prognosis compared to other thyroid malignancies. Overall survival for 10 years can reach as high as 90% if the patient is below young and the treatment is commenced early[10].

## CONCLUSION

BC are common congenital anomalies with contentious theories of aetiology. BC harbouring malignancies are rare, but caution should be taken about that possibility especially when presented later in life. Although pre-operative examinations and investigations may aid in the management, diagnosis of PTC in BC may only be possible through histological examination post-operatively. Diagnosis of primary PTC should be reserved only to cases in which a primary tumour is excluded from the thyroid gland histologically.

## DECLARATIONS

### Ethical approval and consent to participate

Not Applicable


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### Conflicts of interest

The authors declare no conflict of interest.


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