

Wolf in sheep's clothing-ectopic papillary thyroid carcinoma

Case Report

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ABSTRACT

Ectopic thyroid tissue occurs in about 1 in 10,000 people. It can be seen anywhere from foramen caecum to lower neck region. But, it is rarely seen in a lateral neck mass, especially in branchial cleft cyst. Transformation to a malignant state in an ectopic thyroid tissue is uncommon, with most of the diagnoses found routinely through the post-operative histopathological analysis. Hereby, we report a rare case of an ectopic papillary thyroid carcinoma with an initial pre-operative diagnosis of a branchial cleft cyst. However, no primary thyroid gland malignancy was found. The pathophysiology and rarity of these disorders are explored. A high index of suspicion of ectopic tissue and malignancy must be in mind while attending to patients with long-standing, uninvestigated lateral neck masses. Excision biopsy and histopathological study are the two definitive steps to be undertaken.

Key Words: Branchial cleft cyst, ectopic thyroid carcinoma, ectopic thyroid

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INTRODUCTION

Branchial cleft cyst is one of the commonest etiology of a lateral neck mass. During the period of embryogenesis, a branchial cleft cyst can arise from failure of obliteration of the second branchial cleft. Though the nature of this mass is a congenital and benign one, it may not be symptomatic till early adulthood. Periods of upper respiratory tract infection can lead to signs and symptoms of an infected branchial cleft cyst. The reason being the position of lymphoid tissue underneath the epithelium of the cyst. After surgical resection of the mass, recurrence is fairly uncommon.^[1] Rarely, these cysts can be manifestation of metastasis of malignant tumors from nasal and oral cavity, or even thyroid gland.^[2] Meanwhile, papillary thyroid carcinoma is the most frequent type of thyroid malignancy worldwide, accounting for about 80% of thyroid cancers.^[3] Papillary carcinomas tend to metastasize via lymphatic system, which can lead to initial finding of metastatic neck node. Whereas, ectopic thyroid tissue can be seen anywhere from foramen caecum to lower neck region. But it is rarely seen in a lateral neck mass, especially in branchial cleft cyst. Transformation to a malignant state in an ectopic thyroid tissue is uncommon, with most of the diagnoses found routinely through the post-operative histopathological analysis.^[4] This is due to the fact that the ectopic thyroid tissues have the similar capacity as normal thyroid tissues to undergo pathological processes

like inflammation and oncogenesis.^[5] To the best of our knowledge, only a few report of ectopic thyroid carcinoma within branchial cleft cyst have been described in the literature. Here, we share a unique and rare case report of ectopic papillary thyroid carcinoma which has transformed from a commonly occurring branchial cleft cyst.

CASE REPORT:

A 54-year-old man with underlying hypertension, diabetes mellitus and history of stroke presented with complaints of painless left neck swelling for about 10 years. The swelling gradually increased in size and started to become painful with no obstructive symptoms. Bouts of upper respiratory tract infections were the aggravating factors. There were no ear or nasal symptoms. No history of previous head or neck radiation exposure was reported. On examination, a firm, smooth, non-matted swelling sized 4 x 3 cm was palpable at left level IV of neck region. No area of tenderness, redness or skin changes were demonstrable. Flexible nasopharyngolaryngoscope done revealed no abnormalities. Fine needle aspiration cytology of the swelling reported features of an acute inflammatory process with no squamous cells seen. Subsequent computed tomography (CT) scan of head and neck showed a complex cystic lesion at the left posterior cervical space with presence of calcifications which may likely be third branchial cleft cyst. [Figure 1]

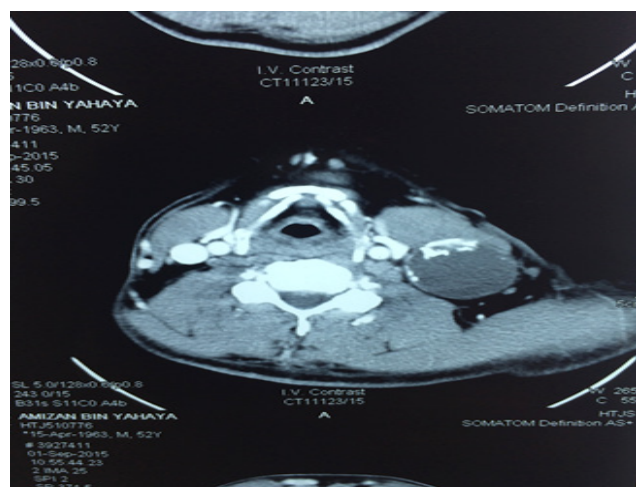


Fig. 1: CT head and neck film showing a complex cystic lesion at the left posterior cervical space, with presence of calcifications (marked by red arrow)

Then, he underwent excision biopsy of the mass and intraoperatively a well-encapsulated, cystic mass measuring about 7 x 5cm was seen at left posterior triangle, and adjacent to internal jugular vein. Small lymph node was seen at left level III region. [Figure 2]

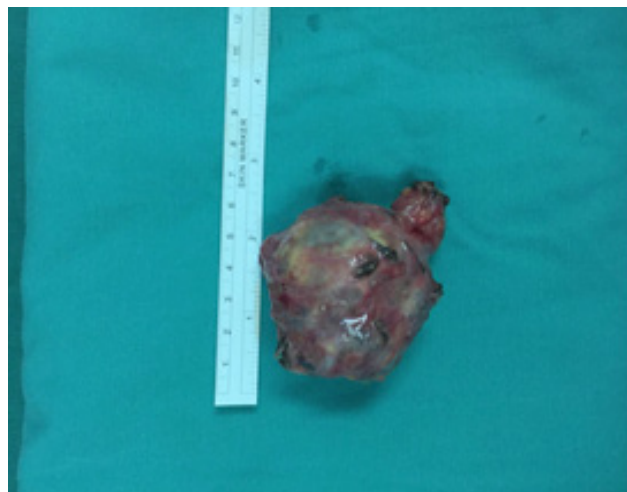


Fig. 2 : Excision biopsy of the left neck mass intraoperatively

Histopathological examination of the mass later revealed an unexpected report of a papillary carcinoma, highly suspicious of thyroid in origin. But as the thyroid glands were normal from the imaging done, the pathologist reported a possibility of a primary tumour arising from an ectopic thyroid. Microscopically, a branchial cleft cyst usually displays a cyst lined by squamous to respiratory type epithelium with a stroma containing lymphoid follicles with a germinal centre. However, the resected sample in this case demonstrated typical features of a papillary thyroid cancer, with cystic wall and broad-based papillary structures lined by columnar epithelium. The three basic nuclear characteristics of a papillary thyroid carcinoma were demonstrated in the resected sample which are the Orphan Annie nuclei, intranuclear inclusions and nuclear

grooving. Immunohistochemistry staining demonstrated a strong nuclear expression of TTF-1 (Thyroid Transcription Factor-1). On contrary, immunohistochemistry staining of a new marker for lung adenocarcinoma called Napsin A was negative. [Figures 3a, 3b, 3c] Clinically, the patient was euthyroid and no thyroid enlargement was noted. Thyroid function tests taken were in normal ranges. Subsequently, the patient was referred to the surgical team for further management.

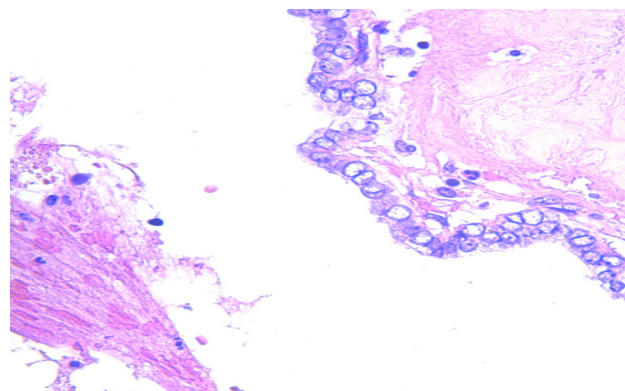


Fig. 3a : Photomicrograph show the nuclei are vesicular resembling Orphan Annie eye and occasional nuclei with nuclear grooving (x400 high power field)

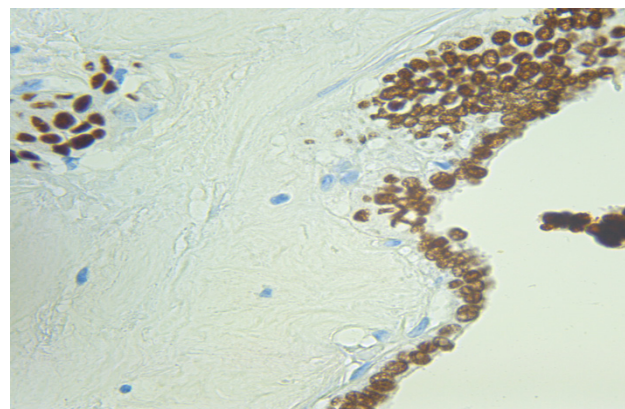


Fig. 3b: Photomicrograph show immunohistochemistry staining displaying strong nuclear expression of TTF-1 (x400 high power field)

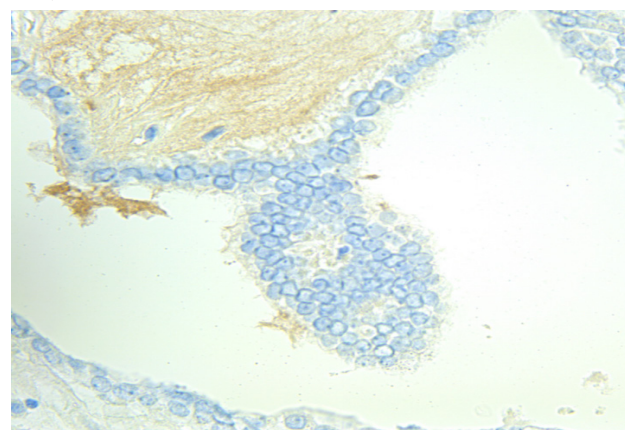


Fig. 3c : Photomicrograph show immunohistochemistry staining for napsin A is negative (x400 high power field)

DISCUSSION

This case report describes a branchial cleft cyst which represent, most likely, an ectopic thyroid tissue with a primary ectopic papillary thyroid carcinoma transformation. Ectopic thyroid tissue occurs in about 1 in 10,000 people. Nonetheless, this is said to be an underestimation only as many of ectopic thyroid tissues have been found during autopsy or surgery.^[6] According to a literature review done, about 90% of ectopic thyroid cases were encountered in the base of tongue. Other locations of lesser incidences of these ectopic thyroid are in submandibular gland, cervical lymph nodes, mediastinum, larynx, trachea, esophagus and rarely in branchial cyst. In an elderly patient presented with a lateral neck mass, it is not easy to clinically determine if the mass is a benign or malignant one. This is more so if the swelling has been present for a longer duration of time and further complicated by any aggravating factor like infection. Though a primary thyroid cancer originating from an ectopic thyroid tissue is rare, many of the cases have developed from thyroid tissues originating from thyroglossal cysts, lingual thyroid and mediastinum.^[7] But, a primary tumour arising from an ectopic thyroid mimicking a branchial cleft cyst as reported here is a rare one. Less than 10 cases of thyroid carcinoma arising in ectopic thyroid tissue within a branchial cyst have been documented in the current literature.^[5] Whereas, most of the cases have been reported as metastasis of occult thyroid cancer in lateral neck masses.^[8]

What are the chances of a carcinoma developing within a branchial cleft cyst? A closer look into the embryology and pathophysiology on how this happens needs to be emphasized. Though studies on branchial cysts are numerous undertaken, the cause is still unclear. Some of the older theories have mentioned that these benign cysts developed from the failure of obliteration of branchial pouches and thus termed as congenital malformations. But, current theories found in literature suggested that a process called cystic degeneration might have given rise to these malformations presenting as lateral, cystic neck masses. The 'inclusion theory' discussed here tells us that epithelium from upper aerodigestive tract or a glandular tissue can gain access to a neck node through the adjacent lymphatic channels. These changes will activate degeneration process to become a lateral neck cyst. This theory of cystic degeneration and development of de novo carcinoma are probably the answers to how a malignant tissue can transform from a benign lesion, as the case discussed here.^[9]

Microscopically, the combination of expressions of Napsin A and TTF-1 markers in immunohistochemistry staining helps to differentiate a primary lung adenocarcinoma from a metastatic lung malignancy. If both markers are positively expressed, a diagnosis of primary lung adenocarcinoma is confirmed and is highly specific.^[10] But this is not present in our patient's case,

as only TTF-1 marker was positively expressed and no suspicious lung lesion was detected from the CT scan. Thus, the possibility of a primary or metastatic lung malignancy was eliminated.

The initial assessment of a patient with lateral neck mass will include a complete medical history, including previous history of malignancy, any prior irradiation history with examination of head and neck. Imaging like ultrasound and computed tomography are also essential. Fine needle aspiration cytology (FNAC) is the first line non-invasive investigation done for cases of cervical lymphadenopathies and neck masses.^[11] It is a good diagnostic tool in obtaining a preliminary diagnosis, especially masses of thyroid in origin but with its own limitations. But is it reliable enough to detect the presence of ectopic thyroid malignancy and FNAC does help to detect any suspicious or malignant cells present in the mass investigated, but may not be able to give a definitive diagnosis especially in cystic masses. Compared to FNAC, biopsy is a superior diagnostic tool as it minimizes the rate of false-negatives of a cancer. A study on fine needle aspiration of thyroid glands describes that the occurrence of false-negative cytological diagnosis relies on the quantity of patients who have undergone surgery and histological analysis thereafter. Less than 10% of patients with cytological diagnosis of benign thyroid masses actually undergo thyroid operation, which concludes that the false-negative rates must not be evaluated with great optimism. However, sampling errors like improper or inadequate sampling are some of the reasons for false-negatives. Therefore, fine needle aspirates should be done in multiple regions of the lateral neck mass, rather than a spot as in this case. This is to improve the sensitivity and specificity of this diagnostic tool. Carcinoma cannot be totally excluded in the nonappearance of malignant cells in an acellular sample. Meanwhile, thyroid lesions which have cystic component must undergo excision biopsy or very close monitoring as these can evolve into a papillary thyroid cancer. This type of cancer can occasionally be missed in fine needle aspirates. Perhaps usage of ultrasound-guided fine needle aspiration would be an effective tool and should be practiced for similar cases in the future.^[12] Nevertheless, histopathology examination from the surgical excision is the most definitive answer to detect these rarely occurring malignancies. Patients can also be treated without much delay, if the biopsy is done earlier than performing repeated FNAC, particularly in these type of diagnosis dilemma.

CONCLUSION

This case report describes a branchial cleft cyst which most likely represent an ectopic thyroid tissue with a primary ectopic papillary thyroid carcinoma transformation. Branchial cleft cyst and ectopic thyroid tissue can both be differential diagnoses of a lateral neck mass in middle-aged population. But a finding of primary ectopic thyroid carcinoma is definitely a rare one

as described in this article. Hence, any uninvestigated, long-standing lateral cystic mass warrants a suspicion of malignancy. Surgical excision remains as the definitive treatment of such masses.

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CONFLICT OF INTEREST:

There are no conflict of interest.

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