A case of papillary carcinoma arising in ectopic thyroid tissue within a branchial cyst with neck node metastasis

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Abstract
We describe the interesting case of a young man who presented with a lateral neck node that was diagnosed as a branchial cyst. Histopathology of the excised node revealed that a papillary carcinoma was located within thyroid tissue, which in turn was located within a branchial cyst. A total thyroidectomy with local lymph node clearance was performed. Histology identified a normal thyroid gland, but a papillary carcinoma in one of the excised lymph nodes was consistent with a metastasis. To our knowledge, this is only the second reported case of a thyroid carcinoma arising in ectopic thyroid tissue that metastasized in the neck.

Introduction
The complicated embryologic development and descent of the thyroid gland expose it to various anatomic aberrations. The formation and development of branchial cysts is a well-hypothesized phenomenon, but to date it remains a mystery. Ectopic thyroid tissue within a branchial cyst is a rare phenomenon, and malignancy within this tissue is extremely rare; only 4 such cases have been reported to date.1-4 We present a case of papillary thyroid carcinoma in a branchial cyst that metastasized to a lymph node in a patient whose normally situated thyroid was free of disease.

Case report
A 31-year-old man presented to our surgical outpatient department with an 8-month history of right-sided neck swelling. On examination, a 4 × 3-cm, nontender cystic mass could be palpated on the right side of the neck, deep to the sternocleidomastoid muscle. Ultrasonography verified the presence of a cystic mass in the same location. Analysis of a fine-needle aspirate revealed the presence of cholesterol crystals. A diagnosis of a branchial cyst was made, and the cyst was excised. Histopathology of the specimen revealed cystic degeneration within a lymph node and the presence of thyroid tissue, most of which was effaced with papillary carcinoma (figure).

With the clinical suspicion that this was a secondary tumor, we carried out an investigation to identify the primary tumor within the thyroid gland and to look for possible other spread. Ultrasonography of the thyroid and computed tomography (CT) of the neck, chest, and abdomen were negative. The results of thyroid and liver function tests were normal, as was the thyroglobulin level. Because of the high degree of clinical suspicion, total thyroidectomy with clearance of local neck nodes was carried out. Histopathology of the excised specimen showed that the thyroid was normal, with no evidence of malignancy. However, one of the lymph nodes in the specimen contained metastatic papillary carcinoma.

The patient was administered an ablative dose of radioactive iodine. Postablation radioiodine uptake scans found no evidence of local or systemic disease. The patient remained on oral thyroxine 2 years after surgery, and he was well with no evidence of recurrence. He continues to be followed up in our oncology clinic.

Discussion
The thyroid gland develops from the median bud of the primitive pharynx at the base of the tongue, and it invaginates like a duct (the thyroglossal duct) caudally. It descends down the neck until it is below the level of the larynx. There, it divides into two lateral lobes that are connected by an isthmus. Cells from the neural crest descend to the ultimobranchial body and finally migrate to amalgamate with the thyroid tissue and form the parafollicular cells (C
The thyroglossal duct undergoes atrophy, and it is usually absent in a newborn. Faulty downward migration of the thyroid leads to ectopic thyroid tissue in the neck. A failure of the duct to atrophy can give rise to thyroglossal duct cysts and cervical fistulae.5-8

The development of branchial cysts is not completely understood. Older theories hold that they are congenital abnormalities caused by an incomplete obliteration of pharyngeal pouches.2-4 Proponents of more recent theories regard them as epithelial inclusions within cervical lymph nodes that can trigger cystic degeneration.9,11

Ectopic thyroid tissue is most commonly found along the course of the thyroglossal duct tract and around the two main lobes of the thyroid glands; it is extremely rare within a branchial cyst.5,12-14 Carcinoma in ectopic thyroid tissue is also rare,15-17 and carcinoma in ectopic thyroid tissue within a branchial cyst is extremely rare. Of the more than 100 cases of the former condition that have been reported, only 3 included involvement of the latter condition.1,2 Our case was very similar to that reported by Sidhu et al.5 After we discovered the papillary carcinoma within the excised branchial cyst, we faced a question similar to the one that faced Sidhu et al: Did the tumor arise de novo within the branchial cyst, or did it represent a metastasis from an occult primary within the thyroid gland? Our clinical suspicion warranted a total thyroidectomy with local node clearance, even after the ultrasound and CT scans were negative. Sidhu et al made a good argument to explain how ectopic thyroid tissue can come to lie within a branchial cyst. Our case differed from theirs in that the primary papillary carcinoma in the ectopic thyroid tissue within the branchial cyst had metastasized to a local lymph node. To the best of our knowledge, only 1 other case of this type has been previously reported in the literature.1

References
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