CASE REPORT

Imaging characteristics and findings in thyroglossal duct cyst cancer and concurrent thyroid cancer

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SUMMARY
Thyroglossal duct cyst cancer is rare, while synchronous thyroglossal duct cyst cancer with thyroid cancer is still rarer. The radiographic features of this case are instructive and crucial when evaluating a thyroglossal duct cyst.

BACKGROUND
Surgery often are faced with patients having thyroglossal duct cysts. It is vital for the patient to undergo appropriate radiographic tests such as sonogram and CT scan to evaluate if a cancer is present in the cyst or the thyroid.

CASE PRESENTATION
A 53-year-old man presented with a large midline anterior neck mass of several months’ duration. He denied any radiation exposure or family history of thyroid cancer. Examination disclosed a 5 cm neck mass situated below the hyoid, which moved with deglutition.

INVESTIGATIONS
Transverse sonographic view of the left thyroid lobe revealed a small 7 mm mainly echo-poor nodule with a punctuate echogenic focus, which may represent a small calcification. Colour Doppler ultrasound revealed mild vascularity at the peripheral margin of this nodule. Fine needle aspiration of the left thyroid mass showed papillary cancer.

CT of the neck with contrast showed a 5.0×4.5×3.2 cm complex thyroglossal duct cyst with a 1.8 cm rest of thyroid tissue with coarse peripheral calcification.

DIFFERENTIAL DIAGNOSIS
Benign thyroglossal duct cyst
Metastatic lymph node
Reactive lymph node
Dermoid

TREATMENT
The patient underwent a Sistrunk procedure and total thyroidectomy with paratracheal nodal dissection.

Final pathology showed a 2.2 cm focus of papillary thyroid cancer with a mixed papillary and follicular growth pattern in the thyroglossal duct cyst, and a 5 mm focus of papillary cancer in the thyroid. Extrathyroidal extension was present. Five of eight lymph nodes were positive for metastatic disease. The BRAF mutation was found in both, the thyroid and thyroglossal duct cyst cancers. All of the margins were clear. The patient subsequently underwent radioimmunoe iodine (RAI) treatment.

OUTCOME AND FOLLOW-UP
The patient was discharged the day after surgery. He has been well after his I131 treatment.

DISCUSSION
Thyroglossal duct cysts usually present in young adulthood. Thyroglossal duct cancer has been reported by most authors as arising in 0.7–1.5% of all thyroglossal duct cysts. Others have reported higher incidences of 4.9–6.5%.

The mean age at diagnosis of thyroglossal duct cyst cancer is about 40 years for females and 38 years for males (less than that for thyroid cancer).

The suspicious clinical features of thyroglossal duct cancer are a hard mass within the cyst wall, fixation to surrounding structures, sudden, rapid expansion, presence of palpable lymph nodes on either side, older age and a coincident firm thyroid mass.

Figure 1 Thyroid cancer transverse sonogram: transverse sonographic view of the left thyroid lobe reveals a small 7 mm mainly echo-poor nodule with a punctate echogenic focus, which may represent a small calcification.
mass. The sonogram and/or CT should also include a careful study of the thyroid and lateral neck. The radiographic features of a mural mass, microcalcification within the thyroglossal duct cyst and central necrosis within the cervical lymph nodes, are suspicious for malignant transformation. Additionally, a concurrent suspicious thyroid lesion may be detected.

The diagnosis can be confirmed with FNA. If there is a complex pattern on the sonogram, the FNA should be taken from the solid portion of the thyroglossal duct cyst under sonographic guidance. However, several authors report relatively low sensitivity of 56–62% for FNA of the thyroglossal duct cyst resulting from the dilution by the cystic fluid.67 Certainly, a suspicious thyroid lesion detected on sonogram should undergo FNA.

Figure 3 Thyroglossal duct cancer precontrast: transaxial precontrast CT view showing peripherally calcified mural nodule within the thyroglossal duct cyst.

Figure 4 Thyroglossal duct cancer coronal cut CT: coronal CT view of thyroglossal duct cyst.

Figure 5 Thyroglossal duct cancer sagittal cut CT: axial CT section (figure 3) and coronal (figure 4) and sagittal (figure 5) reformatted images show a large, predominantly cystic midline anterior neck mass typical of a thyroglossal duct cyst. Peripherally calcified enhancing mural nodule is consistent with malignancy arising within a thyroid remnant contained in the cyst.
The commonest histological type of malignant tumour is papillary cancer, but a follicular variant of papillary cancer is also found. Cervical nodal metastases can be found in 7–75% of cases.348 This wide variation is likely explained by the diversity of opinion for elective neck dissection, and highlights the need for careful clinical and sonographic examination of the lateral neck.

The universally accepted treatment for thyroglossal duct cyst cancer is a Sistrunk procedure. The addition of total thyroidectomy and nodal dissection is controversial. Where total thyroidectomy was performed for thyroglossal duct cyst cancer, 25–60% of the final pathology thyroid specimens showed thyroid cancer.91 Clearly, in this case with a positive preoperative FNA from the thyroid mass, a total thyroidectomy and nodal dissection were necessary. However, even if the thyroid cancer was not obvious preoperatively, in view of the high incidence of occult cancer within the thyroid, concurrent performance of a total thyroidectomy would be advocated.

Recent studies have supported the independent origin of thyroglossal duct cyst carcinomas insofar as only 56% had a V600E BRAF mutation, and, of these, 80% had similar mutations in the thyroid cancer. The lack of uniformity led the authors to believe that the origin of the neoplasm was from a thyroid remnant within the thyroglossal duct cyst as opposed to a metastasis.11
Learning points

- Thyroglossal duct cancer may coexist with thyroid cancer.
- Preoperative radiographic studies, including sonogram and CT as well as FNA, are vital in the evaluation of such patients and can be helpful in suggesting the presence of a cancer in the cyst or the thyroid.
- A Sistrunk procedure and total thyroidectomy are recommended, to be then followed by RAI if necessary.
- In view of the high risk of lymph node metastases, cervical nodal dissection±RAI treatment should be considered.

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Contributors

LS performed the surgery and wrote the text pertaining to the literature search. CHS performed the CT scan and provided the detail regarding the radiological features. AY performed the pathology on the specimen and wrote the pathological description in the text.

Competing interests

None declared.

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Obtained.

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