

Mediastinal thyroglossal duct cyst after thyroidectomy mimicking recurrent thyroid disease: a case report

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Abstract

Thyroglossal duct cysts (TGDCs) are common congenital midline neck lesions, but mediastinal extension in adults is exceptional and may mimic recurrent thyroid disease after thyroidectomy. We report a 55-year-old woman with dysphagia and exertional dyspnoea one year after near-total thyroidectomy for benign multinodular hyperplasia. Computed tomography demonstrated a 76-mm heterogeneous cervico-mediastinal mass extending to the aortic arch with tracheal displacement. Scintigraphy showed no uptake, and fine-needle aspiration revealed squamous epithelial elements with atypia, creating concern for malignancy. The lesion was removed en bloc through the previous cervical incision with thoracic surgical assistance and recurrent laryngeal nerve monitoring. Histology confirmed a benign TGDC with squamous/columnar lining and ectopic thyroid follicles. In post-thyroidectomy patients, a cold mediastinal cystic mass with squamous cytology should prompt consideration of TGDC to guide safe surgery.

Keywords thyroglossal duct cyst, mediastinal mass, thyroidectomy, recurrent goitre, scintigraphy, case report

Introduction

Thyroglossal duct cysts (TGDCs) are congenital remnants of thyroid descent and usually present as midline cervical lesions related to the hyoid bone [1]. Extension into the superior mediastinum is exceptional, and a lesion reaching the aortic arch has been reported only rarely [2]. In patients with previous thyroidectomy, a new cervico-mediastinal mass creates a different diagnostic problem: recurrent goitre, thyroid-bed recurrence, cystic nodal metastasis and non-thyroidal mediastinal cysts must all be considered [3–5]. We report a benign mediastinal TGDC presenting after near-total thyroidectomy as a progressively enlarging, scintigraphically cold mass with squamous atypia on aspiration cytology. The case highlights a practical diagnostic trap and the need for multidisciplinary operative planning.

Case report

A 55-year-old woman presented with progressive dysphagia, cervical pressure and exertional dyspnoea. She had undergone near-total

thyroidectomy in 2021 for benign multinodular hyperplasia. One year later, ultrasonography identified an 11-mm left-sided cervical lesion that was interpreted as residual thyroid tissue. During follow-up, the mass enlarged to 50 × 30 mm.

Contrast-enhanced computed tomography (CT) showed a 76-mm heterogeneous lesion extending from the left thyroid bed into the superior mediastinum, down to the level of the aortic arch, with marked tracheal deviation (Fig. 1). Repeated technetium-99 m pertechnetate scintigraphy demonstrated no radiotracer accumulation in the mass, arguing against functioning recurrent thyroid tissue (Fig. 2). Fine-needle aspiration yielded squamous epithelial elements with atypia. In the post-thyroidectomy setting, this result did not reliably distinguish a benign congenital cyst from cystic malignancy or metastatic disease.

Surgical exploration was therefore performed through the previous Kocher incision. Dense post-thyroidectomy scar tissue complicated dissection. A thick-walled cystic lesion containing yellowish fluid was identified, clearly distinct from recurrent goitre (Fig. 3). The left recurrent laryngeal nerve was identified and preserved using intraoperative neuromonitoring. Because the lesion extended deeply into the

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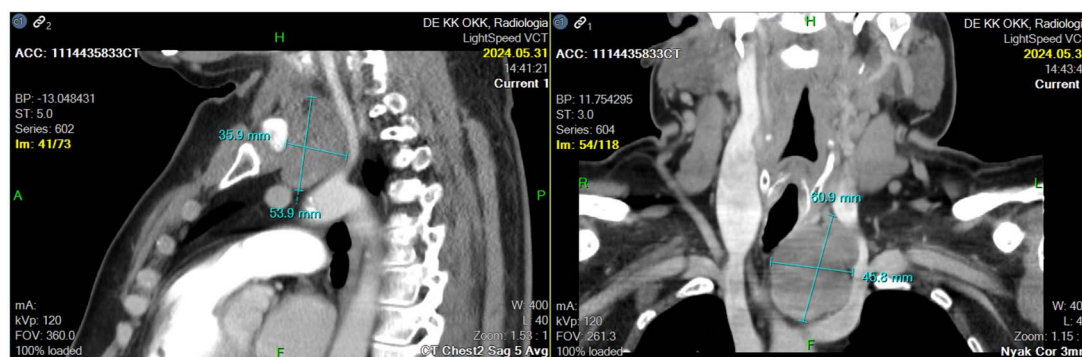


Figure 1 Contrast-enhanced CT demonstrating a heterogeneous cervico-mediastinal mass extending from the thyroid bed into the superior mediastinum, reaching the level of the aortic arch and causing tracheal deviation.

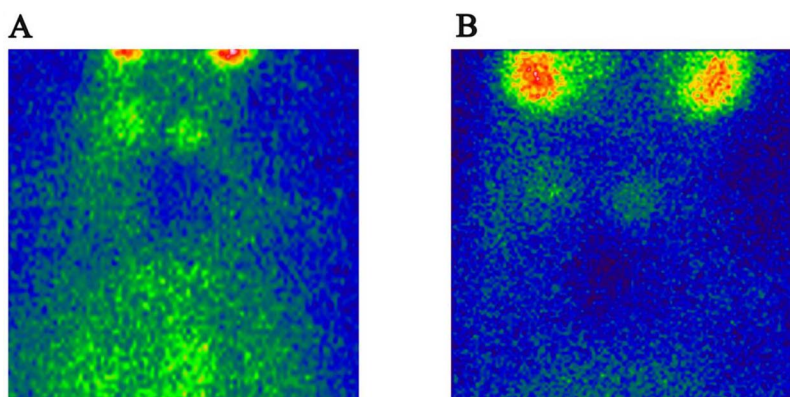


Figure 2 Technetium-99 m pertechnetate scintigraphy showing no radiotracer uptake at the anatomical site of the mass, in contrast to physiological salivary gland uptake.

mediastinum and was close to major vascular structures, thoracic surgical assistance was used for safe distal mobilization. The mass was removed en bloc. Recovery was uneventful, and the patient was discharged on postoperative day 3.

Gross pathology showed a 16.5-g cystic specimen measuring $5 \times 4 \times 3.2$ cm. Histology demonstrated a cyst lined predominantly by stratified squamous epithelium and focally by attenuated cuboidal/columnar epithelium, with mature thyroid follicles in the fibrous cyst wall and a foreign-body giant-cell reaction (Fig. 4). There was no epithelial dysplasia or malignancy. The final diagnosis was a benign mediastinal TGDC.

Discussion

This case is unusual because two diagnostic confounders occurred simultaneously: deep mediastinal extension and previous thyroid surgery. TGDC carcinoma is rare but well documented, and papillary carcinoma in TGDCs can present as a solid-cystic lesion with suspicious cytology [6, 7]. Conversely, benign TGDCs can contain squamous epithelium, and fine-needle aspiration may be misleading when the sample contains squamous cells, keratinous material or inflammatory debris [8]. In our patient, squamous atypia was therefore not diagnostic of cancer, but it appropriately triggered definitive excision because the mass was enlarging and compressive.

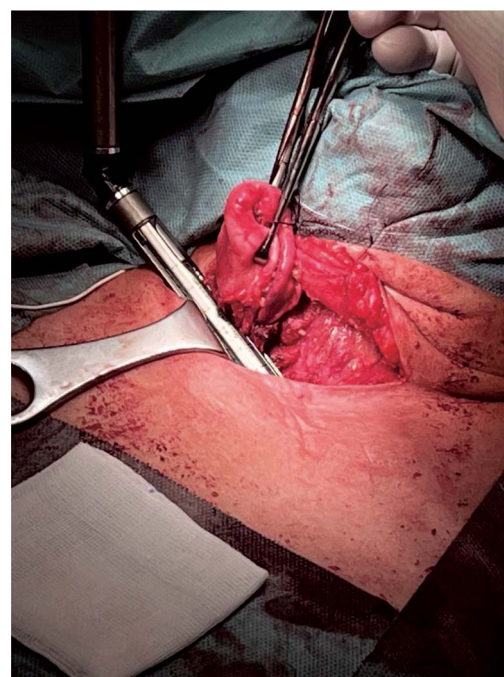


Figure 3 Intraoperative view of the thick-walled cystic lesion during transcervical mobilization from the superior mediastinum through the previous Kocher incision.

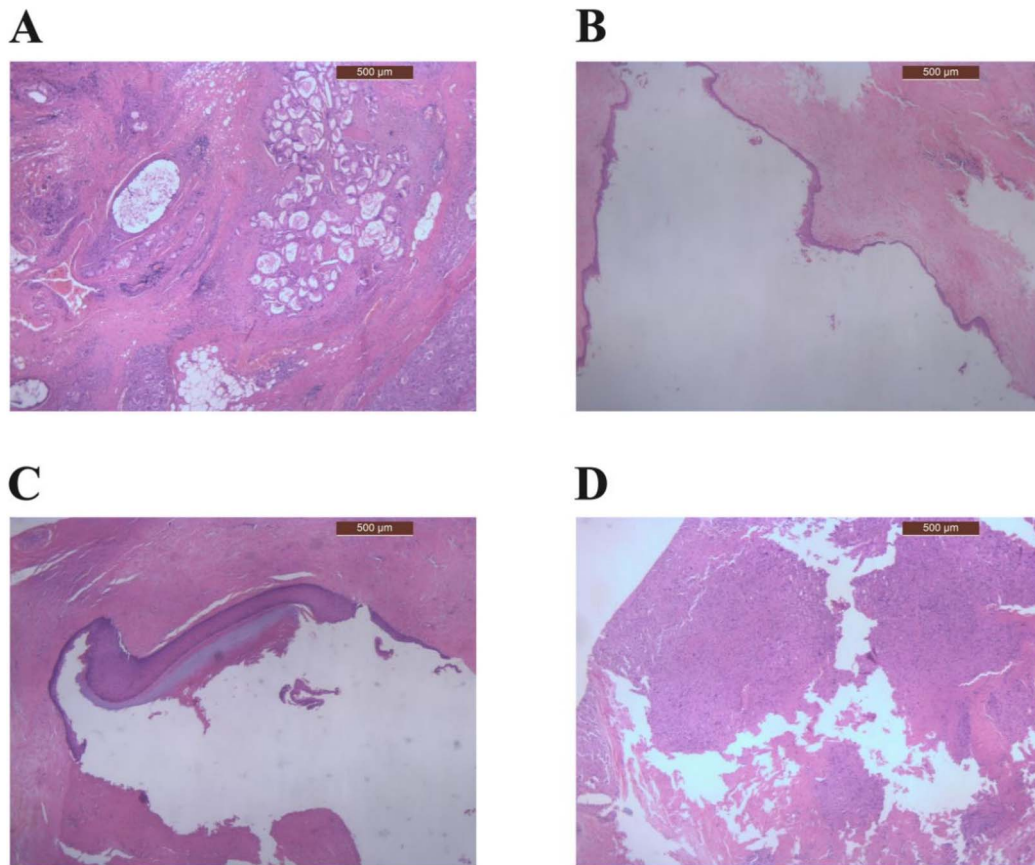


Figure 4 Histopathological examination of the resected specimen (haematoxylin and eosin stain). (A) Ectopic follicular thyroid tissue within the fibrous cyst wall. (B) Attenuated squamous-to-cuboidal epithelial lining. (C) Stratified keratinizing squamous epithelium. (D) Foreign-body giant-cell reaction and chronic inflammatory infiltrate. Original magnification $\times 40$; scale bars = 500 micrometres.

The main preoperative clue was discordance between CT and scintigraphy. A large cervico-mediastinal mass after thyroidectomy is often approached as recurrent thyroid disease; however, complete absence of uptake should broaden the differential to congenital or developmental cysts, bronchogenic cyst, thymic cyst, teratoma, and cystic nodal disease [3–5, 9, 10]. The single most comparable published TGDC case described a mediastinal cyst reaching the aortic arch, but without the added complexity of a previously operated thyroid bed [2]. That distinction matters surgically. Scar tissue increases the risk of recurrent laryngeal nerve injury, while distal mediastinal extension increases the risk of vascular injury. For this reason, neuromonitoring and low-threshold thoracic surgical support were central to safe en-bloc resection.

The practical lesson is not that every cold post-thyroidectomy mass is a TGDC. Rather, TGDC should remain in the working differential when three features coexist: a cystic or heterogeneous cervico-mediastinal lesion, absent scintigraphic uptake and squamous elements on cytology. Recognizing this possibility can prevent both underestimation of operative difficulty and unnecessary oncological overtreatment. Complete excision remains both diagnostic and therapeutic.

Conflicts of interest

None declared.

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Ethical approval statement

The Regional and Institutional Research Ethics Committee of the Clinical Center of the University of Debrecen approved the study under protocol number 6796–2024 RKEB.

Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying images. Due efforts were made to conceal the patient's identity.

Artificial intelligence disclosure

Generative artificial intelligence tools were used for language editing and journal-specific restructuring. The authors critically reviewed, verified and edited all outputs and take full responsibility for the final content.

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