Thyroid carcinoma invading the internal jugular vein

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Case report

A 64-year-old man presented with a gradually enlarging right-sided neck mass over two years, recently associated with dysphagia and exertional dyspnea. Clinical examination revealed a firm right-lobe goiter extending to the suprasternal notch and causing tracheal deviation to the left. There was no cervical lymphadenopathy. Thyroid function tests were normal.

Ultrasound imaging demonstrated a heterogeneous nodular mass in the right thyroid lobe (4 × 5 × 12 cm). Contrast-enhanced CT revealed a multinodular goiter with intraluminal extension into the right internal jugular vein (IJV) through the middle thyroid vein, compressing the trachea and esophagus but without distant metastasis. Fine-needle aspiration cytology was benign (Bethesda II).

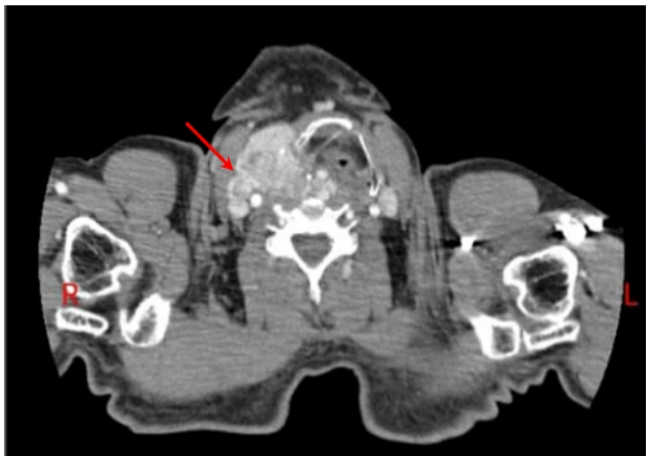

Figure 1: Computerized tomographic scan showing a multinodular goiter of the right thyroid lobe with a tumour thrombus extending into the right internal jugular vein

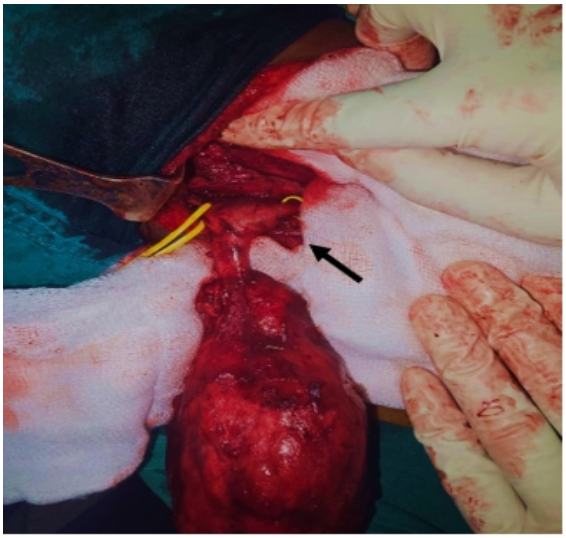

Figure 2: Intraoperative image showing intraluminal part of the tumour thrombus in the middle thyroid vein extending into internal jugular vein before the venotomy

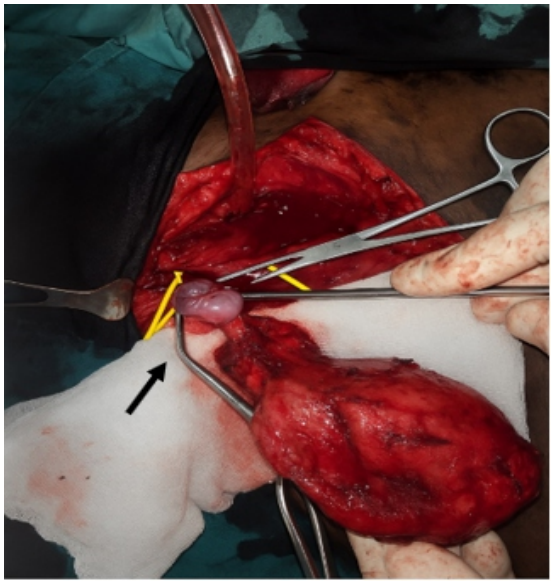

Figure 3: Intraoperative image showing intraluminal part of the tumour thrombus in the internal jugular vein following the venotomy

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Because of progressive airway compression, surgical exploration was undertaken. Intraoperatively, a firm, highly vascular tumor of the right lobe was found extending retrosternally and into the IJV via the middle thyroid vein. A total thyroidectomy with en bloc resection of the middle thyroid vein and a cuff of the invaded IJV was performed. The IJV continuity was restored using a patch graft from the right external jugular vein. The patient recovered uneventfully.

Histopathology confirmed a high-grade differentiated follicular carcinoma with tumor thrombus extending into the IJV lumen but with negative resection margins.

Question:
What is the significance of internal jugular vein invasion in thyroid carcinoma, and how should such cases be surgically managed?

Answer:
Direct venous invasion by thyroid malignancy is exceedingly rare, reported in only 0.2–3.8 % of cases [1]. Follicular thyroid carcinoma exhibits angioinvasive behavior, with microscopic vascular infiltration seen in up to 45 % of cases [2]. However, gross intraluminal extension into major cervical veins such as the IJV represents an unusual but critical finding that alters both prognosis and operative strategy [3].

"Direct intraluminal spread" refers to tumor extension into the venous lumen while maintaining an intact vein wall [9]. Such extension often occurs via the middle thyroid vein. Pre-operative recognition is best achieved with contrast-enhanced CT or Doppler ultrasonography, which can demonstrate circumferential venous encasement of ≥ 180 degrees or intraluminal filling defects with preserved lumen contour [10].

Surgical excision remains the cornerstone of treatment. En bloc resection of the involved thyroid lobe and invaded venous segment is recommended to achieve oncologic clearance [3,13]. Simple ligation of the IJV, although technically easier, can lead to cerebral venous congestion, facial edema, and intracranial hypertension—particularly when the contralateral venous outflow is inadequate [4,11,12]. Hence, venous repair or reconstruction with an autologous or synthetic patch is advocated to preserve drainage and minimize postoperative complications.

In the present case, autologous patch repair using the external jugular vein offered durable venous continuity and avoided the risks associated with bilateral IJV compromise. Postoperative management includes thyroid-stimulating hormone suppression and adjuvant radioiodine ablation as indicated [13]. Long-term follow-up is essential due to the metastatic potential of follicular carcinoma and the risk of recurrence within the venous system [7,8].

This case highlights that intraluminal venous invasion should be suspected when thyroid tumors abut major cervical veins on imaging. A multidisciplinary approach involving endocrine, vascular, and general surgeons ensures optimal resection while safeguarding cerebral venous return. Awareness of this rare presentation aids in preoperative planning and in avoiding potentially catastrophic sequelae of venous ligation.

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