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Case report

Retrosternal goiter presenting as deep vein thrombosis of the arm

F. Jahshan*, E. Sela , O. Ronen

Department of Otolaryngology–Head and Neck Surgery, Galilee Medical Center, Bar-Ilan University, Faculty of Medicine, Galilee, Israël

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ABSTRACT

Introduction: Deep vein thrombosis of the upper-extremity (ueDVT) is often caused by trauma to the subclavian vein, central venous line and hypercoagulation disorders.
Case Report: We present a case of a ueDVT due to retrosternal goiter compressing the right brachiocephalic vein. Low molecular weight heparin was initiated subcutaneously and fluid was aspirated from the thyroid cyst causing an immediate improvement. Cytology detected no malignancy. At eight-month follow-up, the patient showed complete resolution of her symptoms.
Discussion: In general, the optimal treatment should include removal of the compressing thyroid. In co-morbid patients and a dominant thyroidal cyst, thyroid aspiration may be sufficient.

1. Introduction

Upper-extremity deep vein thrombosis (ueDVT) can be a life-threatening event that can cause severe morbidity and mortality. Commonly, patients present with pain, redness, and swelling of the arm, which can be accompanied by severe complications such as pulmonary embolism or superior vena cava syndrome [1].

The etiology of ueDVT is divided into primary and secondary causes. Primary ueDVT causes are thoracic outlet syndrome, effort-related thrombosis, and idiopathic etiology, while secondary ueDVT etiologies are central vein lines, trauma, neck surgery, coagulopathy disorders, and malignancy [2].

ueDVT due to occlusion of the central veins of the neck and mediastinum is usually related to malignant tumors [3]. Central vein occlusion leading to ueDVT caused by benign, retrosternal goiter is a rare phenomenon.

We present a rare case of right arm DVT due to retrosternal goiter compressing the right brachiocephalic vein.

2. Case presentation

An 81-year-old woman with chronic renal failure, hypertension, and anemia presented to the emergency department with breathing distress, right arm pain, swelling, and redness for 2 weeks. On physical examination, there were dilated superficial vessels on her right shoulder, neck, and chest (Fig. 1).

Blood examination revealed leukocytosis (23,000/m^3) with neutrophilia (85%), mild anemia (hemoglobin 11.6 gr%), elevated creatinine level (2.31 mg/dL), pH 7.3, pCO_2 23 mmHg, HCO_3 level 11.9 mmol/L, and TSH level 0.4 μIU/ml.

Venous Doppler ultrasound confirmed the diagnosis of acute deep vein thrombosis within the right subclavian, brachiocephalic, and internal jugular veins (Fig. 2). A large nodule of the right thyroid lobe was demonstrated. Enhanced computerized tomography of the chest and neck revealed a retrosternal multinodular goiter composed of heterogeneous thyroid gland with right-sided cyst that compressed the right brachiocephalic vein and deviated the trachea to the left. Filling defects were demonstrated in the right brachiocephalic, subclavian, and internal jugular veins (Fig. 3).

Low molecular weight heparin was initiated subcutaneously. A differential diagnosis of a malignant, possible anaplastic thyroid cancer was considered; therefore, the thyroid nodule was aspirated under ultrasound guidance superior to the jugular notch of the manubrium, resulting in 50 mL of sero-bloody fluid from the right-sided thyroid cyst. The aspiration procedure was uneventful. Cytology detected inflammatory cells and no signs of malignancy, corresponding to Bethesda classification II. Following aspiration, the patient improved immediately: within hours she had partial resolution of the pain, swelling, and redness in her right arm, and no breathing distress. A multidisciplinary team was assembled composed of internists, endocrinologists, and anesthesiologists for further treatment. After discussion with the patient, the team decided not to perform thyroidectomy due to the patient's co-morbidities, high risk for surgery, and the lack of malignancy in the cytology report. The patient was discharged home with follow-up visits to the otolaryngology outpatient clinic.

* Corresponding author.
E-mail address: forsan.jahshan@gmail.com (F. Jahshan).

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Fig. 1. A. Right arm swelling and redness. B. Right arm swelling and redness. Note the venous collaterals on the neck and sternal region.

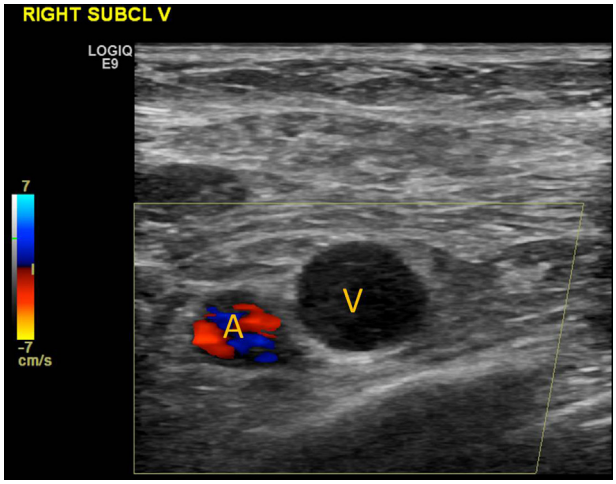

Fig. 2. Color US-Doppler image of the right subclavian artery (A) and vein (V). Note the normal flow in the artery while no blood flow was detected in the vein.

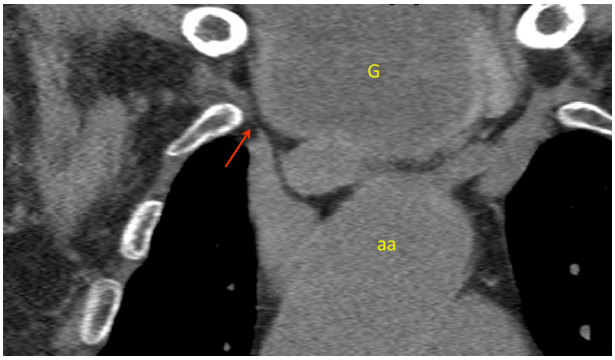

Fig. 3. Coronal (A) and axial (B) chest CT with contrast demonstrating a retrosternal goiter (G) reaching the ascending aorta (aa) compressing the right subclavian vein (red arrow) causing filling defects.

At eight-month follow-up, the patient showed complete resolution of her symptoms including right arm redness, pain, and swelling. The patient refused further imaging tests due to her complete lack of complaints.

3. Discussion

Goiter is a slow-growing benign tumor of the thyroid, and it may take years for the patient to seek medical attention. The thyroid gland may gradually descend into the mediastinum, causing retrosternal goiter.

In general, symptomatic retrosternal goiter is managed surgically by removal of the thyroid gland either by a trans-cervical approach or by sternotomy if the trans-cervical approach fails [4].

An alternative option to surgery is ablative iodine 131 therapy, which is a temporary option and can cause an acute reaction in elderly and high-risk patients [5].

Retrosternal goiter may cause compressive symptoms in patients such as difficulty in breathing and dysphagia due to deviation and narrowing of the trachea and esophagus, and deep vein thrombosis of the central neck and mediastinal veins such as superior vena cava syndrome and internal jugular vein thrombosis [4]. Upper extremities deep vein thrombosis of the central veins of the neck and mediastinum are rare and few cases have been published in the literature (Table 1).

Table 1
A cohort of published studies on ueDVT.

Study	Age, Gender	Presenting symptoms	Veins involved	Treatment	Follow-up
Khan and Khan [6] Naudziūnas et al. [7]	89, M	Arm swelling for 5 days	Subclavian and Axillary BCV, Subclavian, IJV,	Anticoagulants were stopped due to upper GI bleeding.	NA
Herfarth et al. [8]	64, M	Brain ischemic stroke.	Axillary Subclavian, BCV	Autopsy Edema and necrosis of the	Patient died
	60, M 65, M 70, M	Edema of the arms and dilated superficial vessels on the chest.		brain Surgery	Total resolution of symptoms
Santos and Ghalilj. [9]	50, M	Arm swelling for 3 days.	Subclavian vein	Surgery and anticoagulants	18 months "Well"
Pace-Asciak and Higgins [10]	33, F	DVT in the left arm	Subclavian	Surgery and anticoagulants	2 Weeks "Well"

Abbreviations: M: male; F: female; DVT: deep vein thrombosis; ueDVT: upper-extremity deep vein thrombosis; GI:g astrointestinal; IJV: internal jugular vein; BCV: brachiocephalic vein; NA: not available.

Almost all patients mentioned in Table 1 were treated by thyroidectomy, either by trans-cervical approach or combined with sternotomy. One patient refused surgery and anticoagulants were stopped due to gastrointestinal bleeding. There was no available follow-up data about that patient [6].

Another patient presented with an acute brain stroke and died later due to progression of neurologic symptoms. On autopsy, there was brain edema and necrosis, and a giant retrosternal goiter complicated by thrombosis of the brachiocephalic, subclavian, jugular, and axillary veins [7].

Herfarth et al. presented 3 patients with retrosternal goiter and ueDVT. The first patient (60 years old) presented with edema of the arms and dilated superficial vessels on the chest. The subclavian and the brachiocephalic veins were compressed by a retrosternal goiter. He was treated by thyroidectomy with total resolution of the symptoms. The second patient (65 years old) and third patient (70 years old) also presented with ueDVT. As in the first case, a retrosternal goiter compressing the brachiocephalic and subclavian veins resulted in ueDVT. They were treated by thyroidectomy. On follow-up, all three patients had a total resolution of their symptoms [8].

In our case, the ueDVT was due to occlusion of the brachiocephalic, subclavian, and internal jugular veins, which were compressed by a huge right-sided thyroid cyst situated as a retrosternal goiter.

Due to increased operative and postoperative risks in our patient, an ultrasound-guided thyroid aspiration was performed as initial treatment, rather than thyroidectomy, sternotomy, or iodine 131-ablation therapy. She responded very well to the treatment and there was total resolution of her symptoms. Follow-up physical examination revealed no edema or redness on her hand, and the collaterals have disappeared latterly. The patient didn't agree to further imaging studies on her follow-up.

4. Conclusion

Arm DVT may be caused by a benign retrosternal goiter. In general, the optimal treatment should include removal of the compressing enlarged thyroid. In co-morbid patients and a dominant thyroidal cyst, thyroid aspiration may be sufficient. To our knowledge, this is the first reported case of ueDVT due to a retrosternal goiter that was treated only by ultrasound-guided needle aspiration rather than by resection of the compressing thyroid tumor.

Disclosure of interest

The authors declare that they have no competing interest.

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