

## A “Suspected” Free-Floating Thrombus of Innominate Vein in Patient with Thymoma Unresponsive to Anticoagulant Therapy: A Case Study

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### Abstract

**Objective:** Deep venous thrombosis frequently occurs in patients with neoplastic diseases. The risk is increased by approximately seven times in patients receiving chemotherapy or radiation treatment. Upper extremity deep venous thrombosis is uncommon, mainly due to central venous catheters. Thymus gland tumors are rare, representing up to 1% of all primitive tumors. Adjuvant radiotherapy is recommended in presence of residual tumor after surgery.

**Case Report:** We report the case of a patient suffering from thymoma treated with surgery and radiotherapy, who showed echo graphic evidence of hyperechoic, endoluminal, floating formation in the innominate vein, suggestive of thrombosis that was not responsive to anticoagulant therapy.

**Discussion and Conclusion:** This case confirms the difficulty in diagnosing some endoluminal free-floating formations in vascular bed. Recourse to the ex adjuvantibus criterion, consisting in this case in lack of benefits with anticoagulant treatment, should be desirable.

**Keywords:** Floating thrombus; Thymoma; Radiotherapy

### Introduction

Deep venous thrombosis (DVT) frequently occurs in patients with neoplastic diseases. In the general population, the annual incidence of a thromboembolic event is of approximately 117 cases per 100,000 individuals referred by Silverstein et al. [1], the presence of a neoplasia increases that risk by approximately four times, while in patients receiving chemotherapy or radiation treatment the risk is increased by approximately seven times [2]. Until a few years ago, upper extremity DVT was extremely rare, amounting to 1-4% of all thrombi referred by Goldhaber [3], most being linked to specific conditions such as Paget von Schroetter syndrome, idiopathic subclavian-axillary venous thrombosis typical of younger subjects, or associated with thoracic outlet syndrome related to heavy work or sports (weight lifting, butchers). It may also be linked with trauma or neoplastic disease (compression and/or invasion). In the last two decades the incidence of upper extremity DVT has skyrocketed by 60% due primarily to the introduction of central venous catheters and pace-makers. Neoplastic diseases are also associated with possible free-floating thrombus in arterial vessels [4].

Thymus gland tumors are rare, representing a total of 0.2-1.5% of all primitive tumors. They account for 20% of mediastinal tumors. Over 90% of thymus cancers are in the frontal mediastinum, while the remaining ones are in the neck or the other mediastinum compartments of the thorax. Thymus tumors are classified as thymomas and thymic carcinomas [5].

Surgical resection is indicated in a large percentage of cases. Because of the high percentage of recurrences even after a complete resection, adjuvant therapy should be performed for thymoma B2 and B3 types, for thymic carcinomas, for the Masaoka-Koga III stage and even when the intervention has a microscopic residue (R1) or macroscopic (R2) disease [6]. Adjuvant radiotherapy improves survival in patients with R1-R2 disease after surgery [7]. The side effects of radiation treatment, only occurring in the tissues included in the irradiation fields, are classically described as acute (during or immediately after radiation treatment) and late (after 6-9 months after therapy). The risk of side effects and late sequelae is generally low when proper radiation techniques are

employed [8]. Late side effects described in current literature include pulmonary fibrosis, bronchiolitis obliterans, chronic pericarditis, esophageal fibrosis, breast cancer, skin fibrosis and retraction [9].

We report the case of a patient suffering from thymoma, treated with surgical resection and radiotherapy, who showed echo graphic evidence of hyperechoic, endoluminal, floating formation in the innominate vein, suggestive of thrombosis that was not responsive to anticoagulant therapy.

### Case Report

A 53-year-old woman, with a medical history of hysterectomy for fibromatosis, was admitted to the hospital for abdominal pain. The abdominal CT scan showed a pancreatic mass. She underwent a Traverso-Longmire pancreatoduodenectomy for the differentiated neuroendocrine tumor G2 WHO 2010 pT3 pN0 stage II AAJCC 2010 V1 pT2pN0 Stage I ENETS V1, with complete eradication of the disease. The post-operative course was complicated by the development of a biliopancreatic fistula which was conservatively treated, and the occurrence of supraventricular tachycardia. The patient was discharged in good general condition.

During a radiological imaging disease follow-up in the same year, evidence of mediastinal opacity occurred and a thymoma B1/B2 was diagnosed by biopsy. It was treated with surgery and radiotherapy (total dose 54 Gy, divided as single daily doses of 2 Gy for 6 weeks).

After one year, a thyroid ultrasound check incidentally showed a

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Figure 1: CDU scan showing free-floating formation of 8 mm in the right innominate vein.

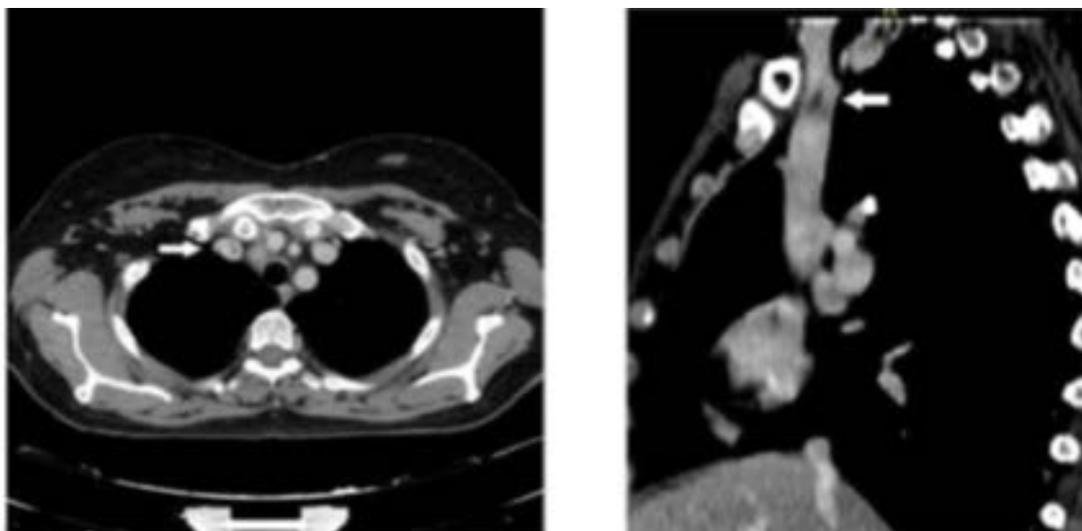


Figure 2: CT scan performed after one year of anticoagulant treatment, confirming presence of free-floating formation of 8 mm in the right innominate vein, A: Axial scan; B: Sagittal scan.

hyperechoic, endoluminal, free-floating formation of 8 mm in the right innominate vein, which was diagnosed as a floating thrombosis (Figure 1). The patient did not refer to any symptoms and objectively there were no signs of inflammation and/or edema on the neck, chest or upper limbs.

The patient started anticoagulant therapy subcutaneously with low-molecular-weight heparin (enoxaparin 100 IU/kg twice a day) for one month; after this period, the ultrasound check showed no imaging

changes. Anticoagulation was then continued orally with rivaroxaban at a dosage of 20 mg/die for one year, since ultrasonographic seriate controls showed no changes, remaining floating and of the same size. A CT scan was then performed, confirming the same findings (Figure 2). Anticoagulant therapy was then interrupted. Because this endoluminal formation did not show any response to therapy, and it remained perfectly unaltered over time, showing no signs of embolization, we hypothesized that it could not be a thrombus.

## Discussion

The case was discussed with the vascular surgeons of our department to evaluate the opportunity to remove such formation or at least to proceed to its biopsy. Considering the high risk related to the anatomic localization and the previous radiation treatment of the region, the unmodified ultrasound imaging during the year and the patient's clinical well-being, the vascular surgeons decided not to operate.

Having to face a lack of diagnosis, patient management remained an open challenge. In current literature there is no evidence of similar cases. Based on available data, we considered as possible a tumor infiltration for anatomic contiguity or a sort of “radiotherapy related vein fibrosis” which fell off the wall over time. We also hypothesized that this entity could have been present before tumor development and its following treatment.

While accepting as possible all these assumptions, the problem persists concerning the prognosis and therefore the therapeutic options. Not knowing the nature of such a formation, we concluded that the only possible management may be serial ultrasound checks over time with the only purpose of verifying the stability of the ultrasonographic features, including size.

## Conclusion

This case confirms the difficulty in diagnosing some endoluminal free-floating formations in vascular bed. Recourse to the ex-

adjuvantibus criterion, consisting in this case in lack of benefits with anticoagulant treatment, should be desirable.

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