

CASE REPORT

Venous thoracic outlet syndrome: When exercising may be discouraged

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Funding information

None

Abstract

Thoracic outlet syndrome results from neurovascular compression at the thoracic outlet. Clinical presentation varies according to the predominantly compressed structure, determining its subtype: neurogenic, venous, or arterial. The neurogenic subtype is the most common, affecting 90% of patients, while the vascular subtype is rarely found in practice. We present two case reports of young patients with upper extremity deep vein thrombosis in the setting of venous thoracic outlet syndrome: one due to an anatomic variant, the second an effort thrombosis due to repeated upper arm exercise. These reports depict uncommon clinical scenarios, which imply significant morbidity if not identified and timely treated.

KEYWORDS

effort thrombosis, paget-schroetter syndrome, thoracic outlet syndrome, upper extremity deep vein thrombosis, upper limb thrombosis

1 | INTRODUCTION

Thoracic outlet syndrome (TOS) results from neurovascular compression at the thoracic outlet, being the vascular subtype rarely found in clinical practice.¹

2 | CASE REPORTS

A 19-year-old woman with no relevant history, usual medication, repetitive physical activity, smoking habits, or drug abuse complained of pleuritic thoracic pain and right-arm swelling. On physical examination, she had inflammatory signs of the arm, symmetrical radial pulse and negative compression maneuvers. Increased d-dimers on

blood analyses. Doppler ultrasound (dUS) revealed deep vein thrombosis of the right subclavian vein (SV). Thoracic computed tomography (CT) showed signs of pulmonary embolism and a clavicular osteophyte compressing the SV (Figure 1). Left-side anatomic similarities, no thrombosis. She was diagnosed with upper extremity deep vein thrombosis (UEDVT). Unsuccessful catheter-directed thrombolysis was attempted, and anticoagulation was initiated. Antiphospholipid syndrome (APS) and thrombophilia were later excluded. Repeated dUS revealed left arterial and bilateral venous compression. Surgical decompression with first rib resection is being planned.

A 23-year-old woman with unremarkable medical history attended the hospital with post-exercise painful right-arm swelling. No usual medication, smoking habits or drug

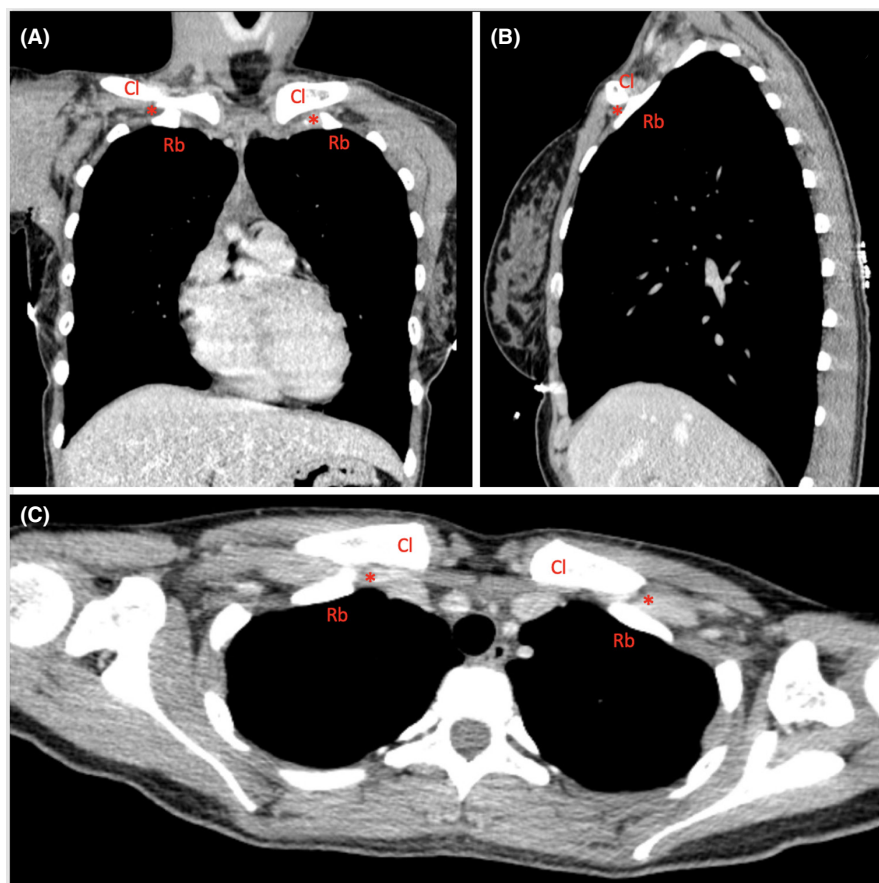


FIGURE 1 Thoracic computed tomography revealing interosseous contact (*) between the right clavicle and first rib in coronal (A), sagittal (B) and axial (C) planes. Cl- Clavicle, Rb - First rib

abuse. Physical examination showed right-arm edema, no inflammatory signs, and present bilateral radial pulse. No unequivocal evidence of vein thrombosis on thoracic CT, no bone anomalies, but internal right-sided collateral circulation. She was diagnosed with UEDVT and discharged on anticoagulation. On the follow-up, dUS showed signs of subacute vein thrombosis. She complained of recurrent postexercise upper limb swelling. Thrombophilia, APS and external venous compression were excluded. Anticoagulation was kept, and postural arm drainage and compression sleeves were recommended.

3 | DISCUSSION

Primary venous TOS (vTOS), also known as effort thrombosis or Paget-Schroetter syndrome, results from axillosubclavian vein compression and thrombosis, due to repetitive upper arm movement.²⁻⁴ It affects otherwise healthy patients in their thirties, with male predominance, mostly involving the right arm.^{2,3} Repetitive compression prompts vascular microtrauma and endothelial lesion, resulting in a proinflammatory status and eventually in thrombosis.²⁻⁴

Both patients were female, which is unusual in vTOS. Considering the first case, bone anomalies (mainly

cervical ribs and clavicular fractures) are usually associated with aTOS, and although she presented left-sided arterial compression, the clinical scenario was of venous thrombosis. Osteophytosis is rare in youth, often associated with bone degeneration. Despite bilateral clavicular osteophytosis, thrombosis was unilateral, with no other identified risk factors. Another interesting feature is the simultaneous venous and arterial compression, being an uncommon case of both arterial and vTOS.

Apart from the patient's sex, the second case depicts effort thrombosis in the setting of repeated exercise. Positional upper arm swelling and collateral circulation suggest a subacute/chronic phenomenon, with possible associated muscle hypertrophy. No risk factors.

Venous TOS has a significant recurrence risk and post-thrombotic syndrome development if not early treated.^{2,3,5} Optimal approach is controversial, comprising anticoagulation, thrombolysis, surgical decompression, and venoplasty.^{2,5}

Vascular TOS is rare, particularly with simultaneous venous and arterial compression.¹ VTOS should be regarded as the acute stage of an underlying chronic phenomenon, with significant associated morbidity.^{2,3}

Our purpose is to remind the natural history of vTOS and to highlight the role of timely diagnosis and the challenging management of this uncommon disorder.

AUTHOR CONTRIBUTIONS

All authors have participated equally in the work and have reviewed and agreed with the content of the article.

CONFLICT OF INTEREST

None.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

DATA AVAILABILITY STATEMENT

The authors confirm that all relevant data are included in the article.

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How to cite this article: Oliveira I, Leal F, Santos L, Almeida Pinto J, Nogueira L, Mesquita M. Venous thoracic outlet syndrome: When exercising may be discouraged. *Clin Case Rep*. 2022;10:e05842. doi:[10.1002/ccr3.5842](https://doi.org/10.1002/ccr3.5842)