

Upper Extremity Deep Venous Thrombosis: A Case Report

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ABSTRACT

Upper extremity deep venous thrombosis (UEDVT) is a lesser-known phenomenon than its lower extremity equivalent, accounting for a smaller proportion of venous thromboembolic events. Despite its modest prevalence, the condition merits attention due to its potential complications, including pulmonary embolism and chronic venous insufficiency. Whilst lower extremity deep vein thrombosis (DVT) cases frequently take the centre stage in clinical discourse, knowing UEDVT's complexities is critical for earlier intervention and improved patient outcomes. The prevalence of secondary UEDVT has been on the rise, attributed to the widespread utilisation of central venous catheters in patients with cancer and other chronic illnesses. We report a case of 51-year-old female with no co-morbidities diagnosed with UEDVT in emergency department (ED) and its pathway to successful management.

Keywords: Case report, Emergency department, Thromboembolic, Upper extremity.

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INTRODUCTION

Whilst the upper extremity deep venous thrombosis (UEDVT) may not always garner the same level of attention as its lower extremity counterpart, its implications extend beyond the acute phase. Several factors contribute to the development of UEDVT, ranging from medical interventions to inherent physiological conditions.¹ Venous catheters, a lifeline for many receiving intravenous therapies, can inadvertently become a source of clot formation. Trauma or injury to the upper limbs, though less common than lower limb trauma, can trigger the coagulation cascade, leading to thrombus formation.² Conditions associated with hypercoagulability, such as certain genetic disorders or acquired conditions like cancer, can also heighten the risk of UEDVT.³ The risk of recurrent thrombotic events, the development of post-thrombotic syndrome, and the potential for chronic venous insufficiency underscore the need for a comprehensive and individualised approach to patient care.^{4,5} This case report details the presentation, diagnostic workup, and successful treatment of a 51-year-old female with no known co-morbidities who presented to the emergency department (ED) with UEDVT.

CASE DESCRIPTION

A 51-year-old obese female presented to emergency room (ER) with 1-week history of complain of left arm pain, new onset left upper arm and neck swelling. She complained of mild breathing difficulty on exertion since past 3 days. The patient denied any history of trauma, fever, or strenuous exercise. Prior to this episode, she was in good health with no recent weight loss, changes in bowel habits, respiratory symptoms, or abnormal bleeding. Additionally, there was no recent immobilisation or injury, no previous history of thrombosis, and she was not using oral contraceptive pills.

During the primary survey, the patient exhibited mild respiratory distress with a respiratory rate of 28/min, a blood pressure of 130/70 mm Hg, and a pulse rate of 84/minute. Oxygen saturation was within normal limits, and the patient remained conscious, oriented, and displayed no focal neurological deficits. The electrocardiogram (ECG) revealed a normal sinus rhythm.

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Patient consent statement: All authors affirm that they have obtained written informed consent from the patient or other approved parties for the publication of this case report along with any accompanying images. This ethical practice ensures respect for the patient's privacy and compliance with standards for medical reporting.

Physical examination revealed unilateral left upper arm and neck oedema with significant tenderness, whilst the secondary survey and other systemic examinations were unremarkable.

An emergency echocardiogram demonstrated good left ventricular systolic function with no regional wall motion abnormalities (RWMA). Subsequently, venous Doppler ultrasonography revealed thrombosis in the left brachial, internal jugular, and innominate veins (Fig. 1). A computed tomography (CT) venogram confirmed extensive thrombus formation from the left brachiocephalic to brachial vein, with minimal extension to the superior vena cava (SVC) and internal jugular vein (IJV) up to the skull base, accompanied by gross tissue oedema (Fig. 2). Following

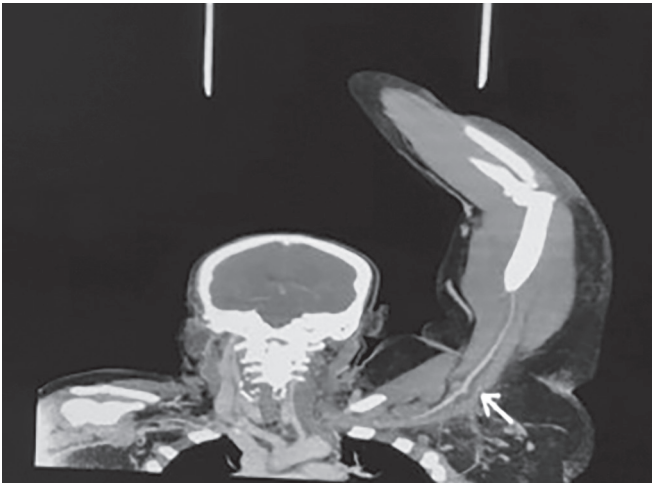


Fig. 1: A CT venogram confirmed extensive thrombus formation from the left brachiocephalic to brachial vein

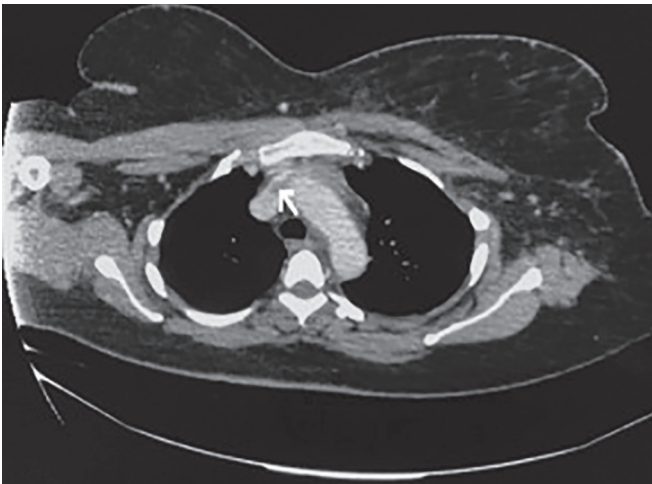


Fig. 2: A CT venogram showing minimal extension of thrombosis to the superior vena cava and internal jugular vein

detailed counselling on the severity of the disease and the proposed treatment plan included intravenous thrombolysis. Post-consent, the patient underwent intravenous thrombolysis with Alteplase at a dose of 100 mg over 2 hours, resulting in a significant reduction in the upper limb swelling. Subsequently, she was initiated on subcutaneous injection Clexane 60 mg and oral anticoagulation with Rivaroxaban for maintenance therapy.

The patient demonstrated symptomatic improvement over a span of 2 days. Basic investigations revealed severe iron and vitamin B12 deficiency anaemia, with haemoglobin levels at 9.6 gm/dL, MCH at 21 pg, MCV at 74 fl, MCHC at 28 gm/dL, vitamin B12 at 120 pg/mL, and serum iron at 14 µg/dL. In response to these findings, the patient received a transfusion of 1500 mg elemental iron and vitamin B12. Subsequent review 1 week later confirmed her continued stability, marking a positive trajectory in response to the administered treatment.

DISCUSSION

As the venous circulation in extremities is at the level of heart, risk of deep vein thrombosis (DVT) is less in upper extremities compare

to lower. Recognition of UEDVT is contingent upon a nuanced understanding of its clinical presentation. Upper extremity deep venous thrombosis and lower extremity DVTs have similar clinical manifestations. Patients may experience swelling, pain, and tenderness in the affected arm, often accompanied by warmth and redness of the skin.⁴ The superficial veins may appear engorged, and in severe cases, movement of the arm may be restricted. During the physical examination of the patient, notable findings included pitting oedema, redness, or cyanosis in the affected extremity. Additionally, visible collateral veins were observed at the shoulder or upper arm, and the patient exhibited signs of fever. Given the absence of trauma or recent medical interventions, such as catheter placement, the differential diagnosis in the present case included infectious and inflammatory causes. However, the clinical suspicion for UEDVT was heightened by the presence of characteristic signs such as swelling and tenderness along the deep venous pathways. However, many symptoms can be nonspecific and overlap with various other conditions, leading to diagnostic challenges. This intricate challenge can be overcome by a combination of clinical evaluation and diagnostic imaging modalities. Ultrasound remains the cornerstone in diagnosing UEDVT, offering a non-invasive means to visualise blood flow and detect the presence of clots.⁶ Once diagnosed, the management of UEDVT revolves around preventing further clot growth and minimising the risk of complications. Anticoagulant medications, commonly referred to as blood thinners, are the mainstay of treatment. These drugs impede the coagulation process, reducing the likelihood of clot propagation. The duration and intensity of anticoagulation therapy vary based on the underlying cause and the risk of recurrence. Initiation of anticoagulation therapy was promptly undertaken in our patient to prevent clot extension and mitigate the risk of embolic events. In some instances, where the clot burden is substantial, more aggressive interventions such as thrombolysis (performed in this case report) or thrombectomy may be considered.⁷ This case report underscores the importance of diagnosing UEDVT rapidly and accurately to prevent thrombosis-related morbidity and mortality and speedy recovery of the patient. The significant risk of complications, including the potential for gangrene and limb loss, underscores the gravity of the situation. Additionally, there is a need to carefully consider and address the possibility of pulmonary embolism and other potential emergent sequelae associated with this condition. Early and comprehensive management is crucial to mitigate these risks.

CONCLUSION

Emergency physicians must maintain a heightened awareness for UEDVT in patients presenting with limb tenderness, swelling, and exacerbated dyspnoea, particularly when traditional risk factors are absent. This case also underscores the importance of addressing underlying nutritional deficiencies in tandem with managing the acute condition, ensuring a comprehensive and sustained recovery for the patient. Given the potential gravity of complications such as life-threatening pulmonary embolism and persistent disability, primary care providers must be well-informed about this condition to effectively diagnose and manage patients within their purview in the ED.

ETHICAL CONSIDERATIONS

The procedures carried out in studies involving human participants adhered to the ethical standards set by the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Key Learnings

- The intensity of symptoms in UEDVT corresponds to the extent of venous blockage. Typical manifestations encompass pain, swelling, and fatigue in one arm.
- Diagnosis typically involves imaging studies such as ultrasound to confirm the presence of a clot and determine its extent.
- Treatment may involve anticoagulant medications to prevent the clot from growing or causing further complications.
- A proactive approach, marked by a swift and accurate diagnosis, is crucial, especially in individuals exhibiting clinical signs and possessing central venous catheters.
- The expedited identification of UEDVT is pivotal for the timely initiation of anticoagulation therapy.

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