

A Case of Spontaneous Axillary Vein Thrombosis

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Abstract

Axillary vein thrombosis is known as upper limb deep vein thrombosis which is a less common condition than lower limb deep vein thrombosis. Repeated trauma secondary to sport or job related arm movements and positions has been recognized as the predisposing factor for upper limb deep vein thrombosis. We describe a 48-year-old healthy female office worker admitted with swelling and pain in her right upper limb. Her history was unremarkable and fully vaccinated against Covid-19. Venous duplex ultrasound confirmed the presence of axillary vein thrombosis. Coagulation studies, immune diseases and cancer screening for secondary thrombosis were unremarkable. The patient was treated with full anticoagulation using low molecular weight heparin. On subsequent follow-up at one week, the patient was symptom free and duplex sonography showed no evidence of thrombosis. We will continue anticoagulation for a minimum of 3 months.

Key Words: Upper extremity deep vein thrombosis; Thrombosis; Axillary vein

Introduction

Lower limb deep vein thrombosis (DVT) is a common and well-described condition which has recently noticed. The risk factors for lower limb DVT comprises of the underlying components of Virchow's triad: venous stasis, hypercoagulability, and injury to the intima of veins.

Upper limb thrombosis, involving the axillary or subclavian vein, is a less common phenomenon¹. This condition is subject to the same risk factors as the formation of lower limb DVT. Another way of assessing the risk factors for upper limb DVT is by considering endogenous (e.g., thrombophilia and pregnancy) and exogenous (e.g., external compression of the vein by the cervical rib or a solid tumor) causes, although it may occur spontaneously².

The relatively fixed position of the axillo-subclavian vein in the thoracic outlet predisposes it to repeated trauma with arm movements, leading to the compression of the vein in the costo-clavicular space. The axillo-subclavian compression between the clavicle and the first rib may also be exaggerated with frequent strenuous arm movements (e.g., tennis and valley balls) or when the upper extremity is in particular positions such as the rigid military style of sitting with the back straight and the shoulders placed posteriorly and inferiorly (e.g., sitting at a computer desk)³. We report a case of spontaneous axillary vein thrombosis.

Case Report

A 48-year-old right-hand dominant woman woke up with acute pain and swelling in her right upper limb. She is a office worker and often reaches out to pick up the items on the shelf everyday. She had no intrinsic risk factors for thromboembolic disease and she doesn't take birth control pills.

On physical examination revealed erythema, heat, swelling, and tenderness localized to the ulna border of her right arm. There was no systemic feature of illness.

Laboratory tests including routine full blood count showed mild hypochromic



microcytic anemia with low serum iron 4.43 $\mu\text{mol/l}$ (7-26 $\mu\text{mol/l}$) and low ferritin 4.0 ng/ml (≤ 73.3 ng/ml), renal and liver profiles, inflammatory markers, thrombophilia test, immune diseases and viral screen were unremarkable, with the exception of elevated D-dimer 6410ng/ml (< 500 ng/ml). Brain MRI was normal.

Venous duplex ultrasound of her right arm demonstrated compressible radial, ulnar, and brachial veins with decreased compressibility in the right axillary vein and confirmed the presence of thrombosis extending throughout brachial and basal veins. Although there was no obvious symptom or sign of pulmonary embolism, we decided to proceed with chest computed tomography. It showed thrombosis of the bilateral lobar pulmonary arteries (**Figure 1**). Abdominal computed tomography only had bilateral ovary cysts. Gastric and colon endoscopy were unremarkable.

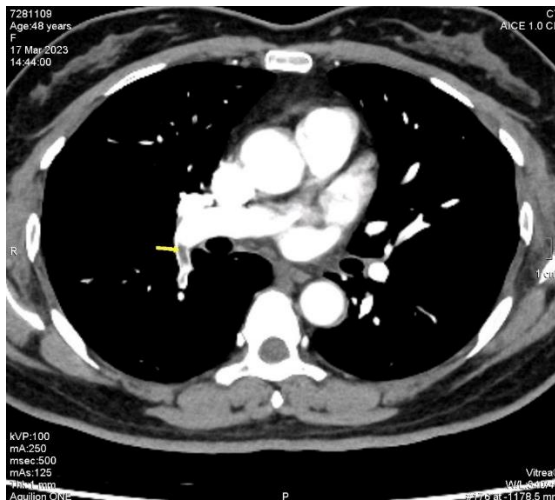


Figure 1. Lobar pulmonary thrombosis (yellow arrow head)

We treated the patient with anticoagulation using subcutaneous low molecular weight heparin and iron supplement, and her signs and symptoms gradually resolved over the next few days. On subsequent follow-up at one week, she remained well and asymptomatic and repeated venous Doppler ultrasound revealed complete resolution of the left axillary thrombosis.

Discussion

Thrombosis of the subclavian vein was first described in 1875 by Sir James Paget⁴, who named it “gouty phlebitis”. However, he incorrectly attributed this syndrome to vasospasm rather than to thrombosis. In 1884, von Schrötter⁵ independently described this condition and postulated that it resulted from occlusive thrombosis of the subclavian or axillary veins. In recognition of these physicians, Hughes⁶ coined the term “Paget–Schrötter syndrome” in 1949 to describe the syndrome of spontaneous primary thrombosis of the axillary or subclavian vein.

The estimated incidence of DVT from all causes is 131.5 per 100 000 person-years. Nonetheless, this may be an underestimation because a number of DVTs remain asymptomatic and therefore undiagnosed⁷. Prior to 1967, thrombosis of the axillary or subclavian vein was estimated to account for 1% to 2% of all DVTs. Since then, its incidence has risen due to increasing usage of central venous cannulation (CVC) and it is now estimated that upper limb DVT makes up 4% to 10% of all episodes of DVTs,

with an approximate annual incidence of 3.6 per 100 000 persons⁸. Thrombosis is thought to occur in the dominant arm in 80% of cases³.

A thorough history taking and an appropriate physical examination are usually sufficient to suggest this diagnosis⁹. This may then be confirmed with a venogram or venous ultrasound scan. Differentiating between primary and secondary upper limb venous thrombosis is crucial in view of their different natural histories. Primary thrombosis accounts for 20% to 50% of all upper limb DVTs^{8,10}. It includes real idiopathic cases and Paget–Schrötter syndrome, which is attributed to repetitive effort.

Major risk factors for secondary DVT are CVC, cancer, and upper extremity surgery¹¹. Approximately, between 30% and 40% of all upper limb DVTs are cancer-related and 70% of secondary cases are related to CVC¹². In a study, 38.5% of the patients who had a peripherally inserted central catheter line developed upper limb DVTs¹³.

As is the case for lower limb DVT, the diagnosis of upper limb DVT is crucial considering its potentially life-threatening complications such as pulmonary thromboembolism¹⁴.

It is predicted that the incidence of upper limb DVT will increase. The incidence of secondary upper limb DVT will increase due to more frequent usage of subclavian vein catheters, especially in patients with cancers, who are already at higher risk of developing this condition. The use of permanent pacemakers is also increasing, which will further add to the incidence of this disease. With our population’s increasingly sedentary lifestyle and the increasing employment opportunities in the information-technology industry with repetitive workload on the upper limb in an almost fixed position¹⁵.

Conclusion

Upper limb thrombosis is a less known and rarer condition than lower limb thrombosis and has been particularly associated with exogenous factors, including sports and occupation. Nevertheless, diagnosis of upper limb DVT is similarly crucial, and recognition and treatment of potential complications such as pulmonary embolism are vital.

Conflict of interest

None

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