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Upper extremity deep vein thrombosis following soft tissue trauma

Yumuşak doku travması sonrası üst ekstremite derin ven trombozu

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A 27-year-old man sustained soft tissue injury to the left shoulder following a fall. Three days later, a diagnosis of left proximal subclavian vein thrombosis was made. The patient was given intravenous urokinase for 24 hours, followed by intravenous unfractionated heparin and oral warfarin. Oral anticoagulant treatment was continued for 12 months. His symptoms completely disappeared after three months of treatment. It is important to be aware of this unusual but potentially serious complication, as early diagnosis and treatment may limit morbidity and mortality.

Key words: Subclavian vein; thrombolytic therapy; ultrasonography, Doppler; upper extremity/blood supply; venous thrombosis/etiology/diagnosis.

Düşme nedeniyle sol omzunda yumuşak doku hasarı meydana gelen 27 yaşındaki erkek hastada, travmadan üç gün sonra sol proksimal subklavyen ven trombozu tanısı kondu. Hastaya 24 saat boyunca intravenöz ürokinaz verildi. Daha sonra intravenöz fraksiyone olmayan heparin ve ardından oral varfarin tedavisi uygulandı. Oral antikoagülan tedavi 12 ay boyunca sürdürüldü. Hastanın yakınmaları tedavinin üçüncü ayından sonra tamamen geçti. Erken tanı ve tedavi morbidite ve mortaliteyi azalttığından, bu nadir fakat tehlikeli komplikasyona karşı uyanık olunmalıdır.

Anahtar sözcükler: Subklavyen ven; trombolitik tedavi; ultrasonografi, Doppler; üst ekstremite/kanlanma; ven trombozu/etyoloji/tanı.

Upper extremity deep vein thrombosis (UEDVT) resulting from repetitive use and strenuous activities is a rare entity. It is most often a consequence of chronic compression of subclavian vein at the level of thoracic outlet. [1] There is little evidence in the English literature regarding the incidence of UEDVT in orthopedic practice.[2]

We present an unusual case of UEDVT which occurred following soft tissue trauma to the shoulder.

Case report

A 27-year-old businessman presented to the emergency department of Silver Oak Hospital, Mohali, India, after sustaining injury to the left shoulder following a fall from bike. He was diagnosed to have soft tissue injury and advised analgesics and a pouch arm sling. Three days after injury, he noticed swelling, heaviness, and tightness in his left upper arm. He denied any shortness of breath and chest pain. On physical examination, swelling of the entire left arm was noted. He had a large bruise on the anterolateral aspect of the arm extending from the shoulder to the mid arm. His radiogram showed no bony injury (Fig 1) and his distal neurovascular examination was normal. There was no jugular vein distension or dilated peripheral veins around the left shoulder. A Doppler ultrasound of the left upper limb showed left proximal subclavian vein thrombosis (Fig 2). He was otherwise healthy and did not report any personal or family history of hematological disorders. He gave a history of smoking 20 cigarettes per day for the last 15 years. The coagulation profiles, including protein C, protein S, and D-dimer were all within normal limits, and anti-phospholipid antibody was not detected in the serum. Complete blood cell count was within the normal ranges.

The arm was elevated and the patient was given urokinase with a loading dose of 250,000 U followed

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Fig. 1. Radiograph of the shoulder and extremity showing no skeletal injury.

by intravenous 200,000 U/h for 24 hours. He was then given intravenous unfractionated heparin followed by oral warfarin. The international normalized ratio was kept at 2.0-2.5. The swelling reduced completely and he was discharged on the ninth day of hospitalization. Oral anticoagulants were continued for 12 months. He was followed-up every three months in the first year and then every six months for another two years. Doppler ultrasonography was performed at every visit. The patient's left arm edema improved gradually and he had no complaints after the third month of treatment. No evidence for post-thrombotic syndrome was noted.

Discussion

Deep vein thrombosis in the upper extremity is a rare but major thromboembolic complication, resulting in symptomatic and fatal pulmonary embolism.[3]

The underlying mechanisms of thrombosis are thought to be a venous compressive anomaly at the thoracic outlet or intimal damage due to a strain of the subclavian and axillary veins by retroversion or hyperabduction of the arm.[1] These movements are usually done during sport activities and deep vein thrombosis may occur in young adults with associated external compression of the vein by cervical ribs, malunited clavicle fractures, tumors, and hypertrophy of the scalene muscles. Other risk factors described are estrogen ingestion, pregnancy, intravenous catheters, anti-neoplastic agents, and pacemakers.[2]

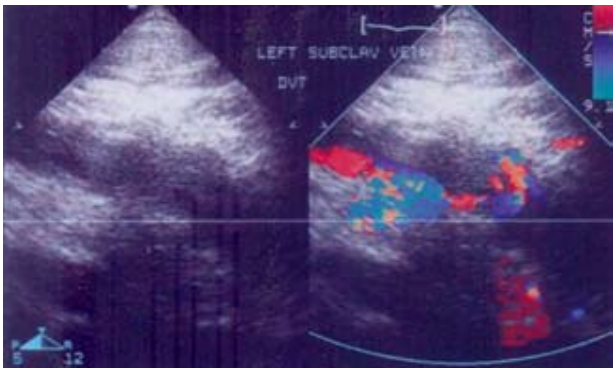

Fig. 2. Color venous Doppler showing proximal subclavian venous thrombosis.

Although early clinical recognition of UEDVT is important, diagnosis may be difficult because of its indeterminate cause and indistinct pathophysiology. Symptoms are non-specific, vary in severity, may be position-dependent and, occasionally, the patient may be entirely asymptomatic.[4] Most commonly, the patient complains of initial heaviness in the affected arm, as well as a dull ache and pain of the involved limb. Other signs may include swelling of the shoulder and arm, discoloration and mottled skin, and distension of the cutaneous veins of the arm. A high index of clinical suspicion is required to detect and make a diagnosis.[4]

The treatment goals are to relieve the acute symptoms of venous occlusion, prevent pulmonary embolism, reduce the likelihood of recurrent thrombosis, and avoid development of post-thrombotic syndrome.[5] Thrombolysis and anticoagulation are the mainstay of treatment. Early diagnosis provides an opportunity for rapid venous recanalization with effective thrombolytic therapy. Suggested optimal period for thrombolytic treatment is within six weeks of the thrombosis.[6] Urokinase or recombinant tissue plasminogen activator are recommended for use.[7] Anticoagulants are used to prevent further deposition of the thrombus, allowing an established thrombus to stabilize and to undergo endogenous lysis, reducing the risk of recurrent thrombosis.

Deep vein thrombosis has been reported in shoulder surgery, shoulder dislocations, and clavicle fractures.[2,7,8] In orthopedic practice, differentiation of deep vein thrombosis from skeletal injury and soft tissue injury is of paramount importance due to similar signs and symptoms produced by both. Moreover, the splintage given in soft tissue and bony injuries of

upper extremity can easily hide the arm swelling produced by deep vein thrombosis.

Mechanism of injury in our case is not clear. The insult was of lesser magnitude to initiate thrombosis. No additional clotting abnormalities were noted. The patient did have a smoking history that might have predisposed him to venous thrombosis. Smoking has been shown to damage vascular endothelium, promote vascular thrombosis, and increase the relative risk of venous thromboembolism. Smoking more than 15 cigarettes per day can increase the relative risk twofold over that of age-matched nonsmoking control subjects.[7] In addition to the patient's smoking history, the other possible factor contributing to his thrombosis might be humeral hyperabduction during fall. Hyperabduction or stretching of the affected extremity may damage the intimal wall of the axillary or subclavian vein.[8] Although such maneuvers are frequently without incident in daily life, in our patient, such a maneuver might have been sufficient to lead to thrombosis.

In conclusion, it is important to be aware of this unusual but potentially serious complication, as early diagnosis and treatment may limit morbidity and mortality. We must be aware of the symptoms of deep vein thrombosis of the upper extremity, and have a high index of suspicion as the symptoms can be easily attributed to the primary injury, resulting in failure to recognize a UEDVT.

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