Axillary vein thrombosis mimicking muscular strain

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Abstract
Axillary vein thrombosis may occur on strenuous activity with a clinical picture similar to a simple strain. It carries significant morbidity but a good outcome is possible with early treatment. The aetiology, investigation, and treatment are discussed. (J Accid Emerg Med 1999;16:233–234)

Keywords: axillary vein thrombosis; upper limb injury; thrombolysis; vascular injury

Case report
A 23 year old man presented with history of aching and tightness in his right arm since rock climbing two weeks previously. While climbing he had reached above his head for a handhold and, on pulling himself up, experienced a sudden sharp pain in his axilla. He had treated himself for a muscular strain with rest and non-steroidal anti-inflammatory drugs but his symptoms had progressively worsened.

The arm was diffusely swollen with a 2 cm × 1 cm bruise in the axilla. The patient had prominent superficial veins bilaterally but those on the right failed to empty on elevation. There was no tenderness and shoulder movements were normal.

Axillary vein thrombosis was suspected and venography was performed showing complete...
occlusion of the axillary vein (fig 1). The typical "tramline" appearance of contrast flowing around a thrombus was not seen, so computed tomography was performed to exclude an extrinsic lesion compressing the vein; this was normal.

Blood was taken for proteins S and C, antithrombin III, and lupus anticoagulant concentrations, all of which were normal. Anticoagulation was then started with intravenous heparin and continued with warfarin. Three months after discharge the patient has some residual swelling but good function. He will resume rock climbing when anticoagulation has been discontinued.

**Discussion**

Axillary vein thrombosis is associated with various aetiological factors. It may occur as a primary event due to vigorous upper limb activity or extrinsic venous compression, but is more commonly secondary to central venous catheterisation or systemic illness causing a hypercoagulable state. Overhead positioning of the arm, as in climbing, may cause stretching and intimal tears of the subclavian vein or venous compression in the costoclavicular space, both predisposing to thrombus formation. It accounts for approximately 4% of all deep venous thrombosis and the incidence is increasing with greater use of central venous catheters.

Patients present with swelling (74%), discoloration (68%), or aching (26%) of the affected limb. Other findings may include venous distension and tenderness. Venography is the investigation of choice and will reveal the position and extent of the thrombus. Doppler ultrasound examination may produce false negative results if large collateral vessels are present, however it is non-invasive and a positive result obviates the need for venography.

Morbidity after axillary vein thrombosis is due to pulmonary embolism and chronic venous obstruction. Pulmonary embolism occurs in 5% to 14% of patients and is more common after primary thrombosis. Venous obstruction may cause persistent swelling and pain and, although these symptoms are less common than after lower limb deep venous thrombosis, 27% of patients remain symptomatic six months after presentation despite treatment.

Anticoagulation is the commonest form of treatment. This will not recanalise the vessel but is aimed at preventing propagation of the thrombus and embolisation. Although no data specific to upper limb thrombosis are available, it would theoretically be possible to start anticoagulation with a low molecular weight heparin on an outpatient basis.

Surgery is usually reserved for the correction of anatomical abnormalities if symptoms persist after a period of anticoagulation. There have been no large trials of either acute thrombectomy or later balloon venoplasty and their roles remain controversial.

Thrombolysis has been shown to produce patency of the affected vessel in 88% of cases. Only 15% of patients treated this way experience persistent symptoms compared with 36% of those receiving anticoagulation alone and 64% of those left untreated. The mean follow-up period of these patients was 1.9 years. It has become the treatment of choice in patients presenting within five days of thrombus formation and is most likely to be successful if administered by local infusion, through a long venous catheter. Unfortunately our patient presented too late for thrombolysis to have been effective.

**Summary**

Axillary vein thrombosis is an uncommon condition that may be associated with a history of injury and so remain unrecognised. If diagnosed early prognosis can be improved by thrombolytic treatment, otherwise anticoagulation alone is the treatment of choice. Surgery should be considered for patients who have anatomical abnormalities and exhibit persistent symptoms.

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