



Pectoralis minor muscle causes venous thoracic outlet syndrome: visualised using venography

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A 50-year-old man attended our specialised clinic reporting swelling, paraesthesia, discolouration, and fatigue in both arms while doing physical activity. The patient said the problem was particularly bad when lifting objects above his shoulders; his right side was worse than his left.

Notably in his medical history, the patient, aged 32 years, was diagnosed with deep venous thrombosis in his left arm which developed after a period of strenuous physical activity; lifelong anticoagulant treatment was initiated at that time and he was switched to apixaban 3 months before we saw him. Also, aged 46 years, he had a further thrombosis in his right subclavian vein; it was successfully treated with thrombolysis followed by 2 years of fenprocoumon. Thrombophilia screening was negative, and a CT scan found no predisposing factors for thrombosis and no skeletal anomalies—including cervical ribs or anomalies of the clavicular bones. Additionally, no soft tissue abnormalities were identified. After the second episode, the treating physicians felt that both thromboses were primary—or spontaneous—since no trauma had been involved and the first episode had developed after vigorous activity.

Examination of the patient at our specialist centre found him to be fit and healthy looking; his heart rate was 81 beats per min and regular, and his blood pressure was 127/72 mm Hg. A cardiovascular examination found no murmurs or gallops and intact radial and ulnar pulses. Neurological examination was normal; we found no swelling, skin discolouration, or other evidence of venous obstruction at rest. The Eden test—or military brace test—provoked his complaints and both cephalic veins became distended.

An x-ray of the thoracic aperture showed no cervical ribs or bony anomalies of the first rib; venography in four positions showed no abnormalities at the costoclavicular junctions in the neutral position, abduction, or adduction. In a military attitude position, significant effacement of the veins was seen at the site of the pectoralis minor on both sides—indicating thoracic outlet syndrome (TOS; figure).

A 2-stage trans-axillary pectoral minor tenectomy was done and the patient immediately reported relief of his symptoms. Postoperative venography showed no further compression (appendix) and the anticoagulation

was stopped. 1 year after surgery, the patient was asymptomatic—even during strenuous activities.

TOS disorders result from compression of either nerves, veins, or arteries in the thoracic outlet. Venous TOS is caused by repetitive extrinsic compression and resultant injury to the subclavian vein at the bony thoracic outlet. Symptoms in the arms are caused by intermittent positional obstruction without thrombosis—known as McCleery syndrome—or with acute or chronic thrombosis—known as effort thrombosis or Paget-von Schrötter syndrome. Compression of the subclavian vein usually occurs at the junction of the first rib and the clavicle: costoclavicular junction. Obstruction by the pectoralis minor muscle at the retropectoralis space—as seen in our patient—is relatively rare.

Patients with positional intermittent subclavian vein obstruction will present with episodic arm discolouration and swelling, usually elicited by either exercise or arm elevation; venograms can be normal at rest. Investigation using venography—rather than CT or MRI—we believe, is preferable since it facilitates communication between the radiologist and patient making it easier to elicit symptoms, and at the same time, observing the compression. If dynamic positioning shows no compression at the costoclavicular junction, the possibility of obstruction by the pectoralis minor muscle must be considered (video).

Contributors

We both provided care for the patient and managed the case. We both wrote and revised the manuscript. Written consent for publication was obtained from the patient.

Declaration of interests

We declare no competing interests.

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See Online for video

See Online for appendix

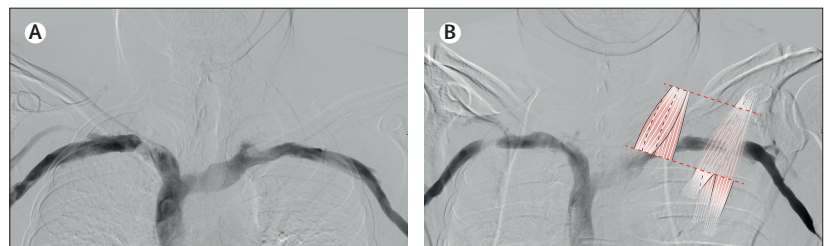


Figure: Thoracic outlet syndrome caused by pectoralis minor muscle. Preoperative venography in neutral position (A) and during military brace test showing the pectoralis minor muscle superimposed and the section that was surgically removed (between the dotted lines; B).