

Case Report:

Scalenotomy for Surgical Decompression of Thoracic Outlet Syndrome: A Worthwhile Procedure

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Compressive lesions at the thoracic outlet declare themselves in the form of vascular and/or neurological symptoms. Contrary to previously held belief, fibromuscular and ligamentous structures create the causative lesions. A simplified knowledge of impingement mechanisms within the anatomic thoracic outlet has led to a new perspective of scalenotomy for adequate surgical decompression for thoracic outlet syndrome. This case report is about a 23 years old male with signs and symptoms of arterial occlusion by soft tissues compression at the thoracic outlet. Surgical decompression of the thoracic outlet was undertaken through right supraclavicular approach and scalenotomy was done which normalized the distal circulation of previously ischemic right upper limb and provided immediate symptomatic improvement.

Key words. Thoracic outlet syndrome, scalenotomy.

The title "Thoracic Outlet Syndrome" was first coined by Peet in 1956¹. Adson and Coffey in 1927 emphasized the role of scalenus anticus muscle in thoracic outlet syndrome while Ochsner, Gage and DeBakey in 1935 named it the "Scalene Anticus Syndrome" and made the first successful resection of the anterior scalene muscle. A thoracic outlet syndrome is only rarely caused by osseous anomalies². Instead, it is a soft tissue disease where the C8 and T1 or the proximal inferior trunk of the brachial plexus is compressed by fibromuscular anomalies between the inferior cervical spine and the first rib or pleura. There is a wide range of variations in fibrous, muscular and osseous structures with the potential to entrap the brachial plexus and / or vessels at the thoracic outlet³. Though difficult to diagnose clinically, surgical treatment of the soft tissue anomalies at thoracic outlet like scalenotomy and excision of fibrous bands provide instant relief of disabling symptoms to the patients. The prevailing symptoms of compression on axillosubclavian arterial segment at the thoracic outlet are pain in forearm (arm claudication), feeble or absent radial pulse, numbness of the fingers and temperature and colour changes.

This case report emphasizes the significance and usefulness of scalenotomy for symptomatic relief of vascular complications associated with thoracic outlet syndrome observed in a 23 years old male who underwent surgical decompression of thoracic outlet at Surgical Unit 1, Jinnah Hospital Lahore.

Case report

A 23 years male was admitted in Surgical Unit 1, Jinnah Hospital Lahore through outpatients with 3 months history of sharp pain in his right forearm. Pain was triggered by the use of arm and relieved by rest. The pain gradually worsened to the extent to affect his routine life and prompted him to seek medical advice. He also complained of unduly pale right hand when held aloft and bluish

discolouration when kept dependent for sometime. Patient belonged to a non-labourer class and used to smoke 8 to 10 cigarettes per day. His examination revealed feeble right radial pulse, which disappeared on raising the arm. The aforementioned colour changes in right hand were confirmed on clinical examination. There were neither muscle wasting or neurological deficit in right upper limb nor any palpable / pulsatile lump in right supraclavicular fossa. Rest of his examination was unremarkable. His investigations like FBC, ESR, urea, creatinine, serum electrolytes, blood glucose, urine C/E, chest x-ray, C-spine x-ray and thoracic inlet views were normal. Duplex scan confirmed diminished blood flow in right subclavian artery and the distal arterial tree of right arm. Exploration of right thoracic outlet was undertaken through supraclavicular approach. Scalenus anterior muscle was found to be quite bulky and compressing the subclavian artery, though no osseous anomaly was encountered. Division of scalenus anterior was done allowing the subclavian artery to slide forwards to a lower level on first rib. Wound was closed in layers. Patient had uneventful recovery and immediate postoperative symptomatic improvement. Right radial pulse was comparable to its counter part and the postural colour changes in right hand noted previously also disappeared. Check duplex scan showed normal blood flow in right subclavian artery and distal arterial tree. Patient was discharged on 7th postoperative day and his follow-up one-month later in Surgical Outpatients was satisfactory.

Discussion

Neurovascular compression syndromes at the thoracic outlet generally present with predominantly arterial, venous or neurogenic symptoms⁴. The arterial abnormalities produce unique problems in diagnosis and management and usually affect young, otherwise healthy, active individuals. Hood et al have concluded that the most

severe presenting symptoms of arterial occlusion or embolization found to be originating from axillosubclavian arterial segment were: arm claudicating (74%), hand ischemia (48%) and digital gangrene (44%)⁵. Anatomical variations at thoracic outlet may be clinically significant but many are inadequately described or quantified⁶. The commonly described anatomical relationship of the brachial plexus lying between scalenus anterior and medius muscles was found in only 60% of instances. Variations in neck anatomy are important to surgeons performing surgical procedures in this region. Anesthetic blocks of the anterior scalene muscle have been advocated as a means of predicting which patients may benefit from surgical decompression⁷. Electrophysiological guidance facilitates accurate needle tip placement in the performance of anterior scalene muscle blocks and the results appear to correlate with surgical outcomes following anterior scalenotomy and division of fibrous bands.

In mild case of vascular thoracic outlet obstruction, the use of a sling and exercises aimed at strengthening the muscles of the shoulder girdle may alleviate the symptoms, at least temporarily. In about 70% of cases even if a cervical rib cannot be recognized, the symptoms are relieved by dividing the scalenus anterior muscle. Nasim et al have concluded in their study that 87% of patients who underwent surgical decompression had improvement in the symptoms and the procedures included: excision of cervical rib (57%), excision of first rib (27%), scalenotomy (13%), and excision of cervical and first ribs (3%)⁸. These results reveal that surgical decompression for the thoracic outlet syndrome is a worthwhile procedure and is associated with relatively few complications. Supraclavicular approach has been found to be favoured by most of the surgeons because of this being safe as compared to the transaxillary thoracic outlet decompression. Supraclavicular scalenotomy and cervical rib excision is a safe and effective procedure for most patients with thoracic outlet syndrome⁹. In contrast, Hood et al has stressed a combined approach of thrombolysis and surgical decompression for vascular affections of thoracic

outlet syndrome to attain a salutary outcome in a majority of cases⁵.

To conclude, this case report reaffirms the concept that the vascular complications of thoracic outlet syndrome are uncommon but may result in significant long-term morbidity. In the absence of a recognizable cervical rib, fibromuscular and ligamentous anomalies are mainly responsible for the compressive symptoms at thoracic outlet. Division of scalenus anterior muscle alongwith the fibrous bands through supraclavicular approach is recommended in view of its high safety profile and symptomatic relief.

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