Case Report

First Single Centre Experience in Thoracic Outlet Syndrome

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Abstract

Thoracic Outlet Syndrome (TOS) resulting from compression of irritation of the neurovascular structure at various level of the cervico-thoracic-brachial passages.

Here, we describe a case in a 56-year-old woman. She initially experienced right-sided shoulder pain and fingers numbness increase with exercise and persisted after cessation of activities diagnosed as Neurogenic Thoracic Outlet Syndrome (NTOS). Physical examination revealed chronic neurogenic changes in the hand muscles. Further investigation showed cervical rib on plain X-ray. The patient underwent surgical decompression was performed scalenectomy and long transverse process and fibrous band resection. The pathophysiology, radiology, classification, and treatment strategy are discussed in the report.

INTRODUCTION

The Thoracic Outlet Syndrome (TOS) defined as clinical symptoms caused by the entrapment of neurovascular structures route to the upper limb via the superior thoracic outlet. The incidence of TOS has been reported to be approximately 0.3–2% of the general population between the ages of 25 and 40 years with female and male ratio up to 4:1. The neurogenic form of TOS accounts for 95%–99% of all TOS cases with 2–5% affecting vascular structure, such as subclavian vein and artery [1-5]. Often a congenital predisposition for developing neurogenic (NTOS) coupled generally due to a congenital bony anomaly a cervical rib, a prolongation of the C7 transverse process, or fibrous bands or anomalous muscles [6]. Also, trauma that causes chronic cervical muscle spasm and repetitive motion may precipitate NTOS such a hyperextension-flexion injuries of arm, neck trauma due to motor vehicle accidents and neoplasm [3,6-8].

CASE PRESENTATION

This 56-year-old woman who was otherwise healthy, presented with right-sided shoulder pain and fingers numbness increase with exercise and persisted after cessation of activities. The pain was increased by continuous overhead activities and downward traction. Physical and neurological examination found assessment range of motion in her right shoulder proved negative for sign and symptoms of glenohumeral pathology, but the overhead fatigue test (upper arms abducted to 90° and shoulders externally rotated to 90°, while the grip in both hands were squeezed and relaxed) revealed that the right arm developed pain and fatigue. Neck rotation and head tilting (ear to shoulder) Which elicit symptoms of pain and paresthesia down the contralateral side. Upper Limb Tension Test (ULTT) Arms abducted to 90° with elbows extended and dorsiflex wrists with head tilt to side, ear to shoulder. No history of trauma and chronic repetitive motion. Electromyography (EMG) revealed unrecordable medial antebrachial cutaneous sensory and low-amplitude median motor responses (recorded from thenar muscles) along with chronic neurogenic changes in the hand muscles. Radiological cervical plain X-ray revealed cervical rib or long C7 transverse process (Figure 1). Each maneuver...

Figure 1 Right Cervical Rib on plain anterior cervical X-ray (blue arrow).
progressively increases stretch on the brachial plexus eliciting pain. Sensory disturbance can include numbness, paresthesia, or both in a dermatomal pattern over the ulnar aspect of the forearm and hand muscle wasting and atrophy (Figure 2A, 2B).

**DISCUSSION**

The term 'thoracic outlet syndrome' was originally coined in 1927 Adson describe his maneuver what today is called thoracic outlet syndrome [1]. The incidence of TOS has been reported to be approximately 0.3–2% of the general population between the ages of 25 and 40 years, and is much rarer in the younger population, affects approximately 8% of population with female and male ratio up to 4:1 [1-4]. There are three basic of TOS neurogenic (brachial plexus compression), arterial (subclavian artery compression) and venous (subclavian vein compression), but 95% to 98% cases are considered neurogenic [1,8-10].

All 3 forms of TOS are clinically important because, when inadequately treated, they can cause chronic pain and long-term restrictions syndromes of the upper extremities, and substantial disability even in relatively young, active, and otherwise healthy individuals [5].

Neurogenic TOS approximately 95% of all patients, dull aching in lateral aspect of the neck, shoulder, parascapular region, and inner portion of the arm is often describe. Discomfort may be provoked by repetitive use of extremity, particularly with overhead activities. Sensory disturbance can include numbness, paresthesia, or both in a dermatomal pattern over the ulnar aspect of the forearm and hand muscle wasting and atrophy in the hand can be seen in advance cases of neurogenic TOS. A classic finding is the so called Gilliatt-Sumner hand in which a dramatic degree of atrophy occurs in the abductor pollicis brevis, and lesser atrophy in the interosseous and hypothenar muscle, TOS induce muscle in both median and ulnar nerve distribution, whereas the sensory findings are confined to the ulnar nerve distribution [1,4].

Venous type TOS approximately 3-5% of all patients usually occurs in young adults with a history of vigorous arm activity patients, patients suffer from compression axillosubclavian vein which ultimately result in thrombosis, may acute or chronic, occlusive or partially. Patients will report acute onset purplered discoloration of swollen extremity and as time progresses patients will noticed dilated superficial veins across shoulder, chest, back and neck. Arterial type TOS is the rarest from counting from only 1-2%, continuous friction of the subclavian artery and the underlying first rib from pulsation and activity can cause fibrosis and stenosis of the artery. Clinical sign include painful blue or white finger in subacute phase in chronic phase claudication or pain of the arm with the cessation of movement [1,3-5,11].

Figure 2 case show woman in fifth decade diagnosed NTOS according to symptoms, EMG and radiological modality, The objectives of surgical treatment for NTOS are to diminish the symptoms and prevent irreversible damage of the brachial plexus. The anterior supraclavicular approach allows wide

![Figure 2](image-url)
exposure of supraclavicular plexus and the middle two third of the first rib, where the most anomalous fibrous band are attached. During exposure important anatomic landmarks was identified and performed the anterior scalenectomy, the first rib and fibrous band resection (Figure 2C-D) [10,12,13]. Six month following surgery under control with rehabilitation medicine the patient show improvement of the symptoms sensoric and motoric [6].

Surgery for NTOS does not always give successful outcomes Patients with unresolved symptoms and recurrent are older, active smokers with more comorbid pain syndromes, neck and/or shoulder disease, and a longer symptom duration [11,14,15].

CONCLUSION

The diagnosis and management of TOS has remained controversial, the accuracy of numerous tests has been established, and a clinician can implement these tests to strengthen a diagnostic suspicion. This is especially important when neurophysiological testing contradicts the clinical presentation. Once a thorough history and clinical examination is completed, the clinician can decide upon a management strategy appropriate for the individual patient. Surgery is generally reserved for cases of NTOS that does not respond to conservative measures.

CONSENT

Informed consent was obtained from the patient for publication of this case report and any accompanying images. His family was present at the time.

AUTHORS’ CONTRIBUTIONS

FY, FS, MY, VG, MZA, and AF had examined, treated, observed, and followed up the subject of this research. FY and FS performed the operation on the patient. All authors participated in writing the manuscript. All authors has read and approved of the final manuscript.

REFERENCES