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An Unusual Presentation of Cervical RIB With Chronic Brachial Artery Thrombosis: A Case Report

KEYWORDS: Cervical rib, thoracic outlet syndrome, subclavian artery, thrombosis, excision.

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ABSTRACT *Cervical ribs associated with Thoracic Outlet Syndrome (TOS) lead to symptoms of Neurological TOS (NTOS) and in a few cases symptoms of Arterial TOS (ATOS) either due to stenosis or aneurysm of the subclavian artery. Symptoms of ATOS usually appear after the formation of emboli, which may dislodge either distally or retrograde. We report a similar case of TOS with bilateral cervical rib with unliateralsubclavian artery stenosis with chronic thrombus in the brachial artery for which cervical rib excision was done. Arterial TOS is seen in less than one percent of cases and vascular sequelae occur due to intermittent and long term compression of the subclavian artery by the cervical rib. But there may be a need of surgical intervention in cases of acute ischaemia. But in cases having chronic thrombotic occlusion of the vessels where collaterals have developed, presenting with only neurological symptoms, only cervical rib excision may suffice.*

Introduction:
Thoracic outlet syndrome is defined as "upper extremity symptoms due to compression of the neurovascular bundle by various structures in the area just above the first rib and behind the clavicle."[1]Types of TOS are either Neurological (NTOS), Arterial (ATOS) or Venous (VTOS), of which NTOS is the most common (90%) and ATOS is the least (<1%).[2]Thus it is important to differentiate the type of TOS. Arterial complications following TOS are rare and may lead to significant sequelae and therefore are more severe than NTOS. Cervical ribs associated with TOS lead to symptoms of NTOS and in a few cases symptoms of ATOS either due to stenosis or aneurysm of the subclavian artery. ATOS is more frequently seen in patients with a complete cervical rib or an anomalous first rib. The patients with ATOS usually present with ischemic pain of the digits, coldness of extremity, paraesthesia and continuous pain in the hand. These symptoms occur spontaneously. Symptoms of ATOS usually appear after the formation of emboli, which may dislodge either distally or retrograde. We report a similar case of TOS with bilateral cervical rib with unilateral subclavian artery stenosis with a chronic thrombus in the brachial artery.

Case History:
20 year old male patient came to outpatient department with complaints of tingling on the medial aspect of right upper limb and claudication pain in the right upper limb for last three months. These complaints were insidious in onset and gradually progressive. On examination patient had weak handgrip and sensory deficit in C7 and C8 dermatomes. Distal radial pulses were not palpable on right side but the extremity was warm and there were no signs of an acute ischaemic episode. X ray of cervical spine confirmed bilateral cervical ribs (Figure 1. Xray of Cervical Spine). Computed Tomography scan confirmed presence of bilateral complete cervical ribs anteriorly fused with first rib near the scalene tubercle (Figure 2 CT Scan showing Bilateral Cervical rib). Colour Doppler of right upper limb showed presence of complete intermittent occlusion of subclavian artery on overhead abduction and chronic thrombotic occlusion of brachial artery with no flow in ulnar and radial arteries. CT angiography revealed narrowing of subclavian artery at the level of cervical rib with post stenotic dilatation but no thrombus in the artery at that level (Figure 3 CT Angiography showing narrowing of the subclavian artery with post stenotic dilatation and brachial artery thrombosis). Brachial artery had thrombus in its proximal one third and at the level of bifurcation with adequate collateral circulation for distal perfusion.

Patient was operated for cervical rib excision and thrombectomy of the brachial artery on the right side (Figure 4Subclavian artery after excision of cervical rib). Post operatively patient had significant reduction in pain and radial pulse was palpable. Sensory deficit recovered gradually over a period of three months. At the latest follow up of 3 months, the patient does not have rest pain, handgrip strength has improved and there is partial recovery of the sensory loss.

Discussion:
Of all the cases with TOS, 98% suffer from the symptoms due to compression of the brachial plexus, and only two percent of cases present with symptoms due to vascular compression.[2]In early stages, arterial compression is asymptomatic and unrecognized but sometimes patient may present with acute ischemia due to embolism consequent to the arterial damage. Stenosis of the vessel may occur due to chronic intermittent compression of the vessel, which initially is reversible after which fibrotic changes occur. According to Virchow's triad, changes in the vessel may lead to formation of a thrombus and subsequently an embolization.

The type of cervical rib plays a significant role in case of arterial complications. Neurological complications are produced by short and incomplete ribs, and arterial complications are due to complete rib.[5]Our patient had an incomplete rib on the left side and complete cervical rib on the right side with right subclavian artery stenosis and right proximal brachial artery thrombosis. He presented with pain, paraesthesia over right fingers, reduced grip strength and absence of radial and ulnar

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pulses in right hand, but the extremity was warm owing to the formation of collaterals. As patient had more of neurological symptoms, we decided only to decompress thoracic outlet by cervical rib excision through supraclavicular approach and brachial artery thrombectomy was performed through anterior approach in cubital fossa.

Post-operatively patient had relief of neurological symptoms at the latest follow-up. Patient was instructed strictly for a regular follow up and was also informed about the requirement of arterial reconstruction if acute limb ischaemia occurs any time due to arterial embolism.

Previous studies have emphasized upon arterial reconstruction in patients who have subclavian artery stenosis and post stenotic aneurism with intimal damage.[5]But unlike our case, most of these cases had acute ischaemic episode due to arterial embolism without formation of collaterals.

Arterial TOS is seen in less than one percent of cases and vascular sequelae occur due to intermittent and long term compression of the subclavian artery by the cervical rib.[4]Incases having chronic thrombotic occlusion of the vessels where collaterals have developed, presenting with only neurological symptoms, only cervical rib excision may suffice. But there may be a need of surgical intervention in cases of acute ischaemia and therefore a regular follow-up and post-operative anticoagulation therapy is a must.

Abbreviations: TOS- Thoracic outlet syndrome

ATOS- Arterial Thoracic outlet syndrome

NTOS- Neurological Thoracic outlet syndrome

VTOS- Venous Thoracic outlet syndrome

Figure 1.Xray of Cervical Spine

Figure 2 CT Scan showing Bilateral Cervical rib

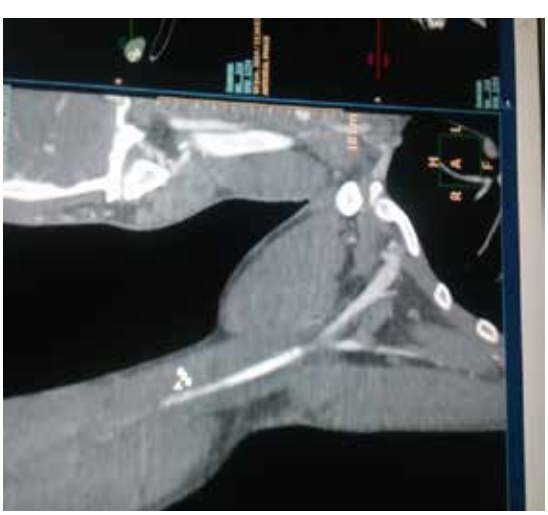

Figure 3 CT Angiography showing narrowing of the subclavian artery with post stenotic dilatation and brachial artery thrombosis

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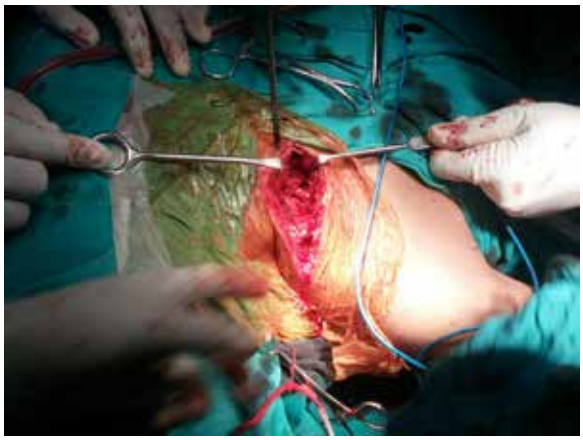

Figure 4 Subclavian artery after excision of cervical rib

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