



Cervical Rib : A Case Report with Review of Literature

KEYWORDS

cervical rib, surgery

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ABSTRACT *Cervical ribs give rise to vascular and neurogenic manifestation in the upper limb due to stretching and friction of neurovascular bundle in the base of the neck by numerous mechanisms that includes cervical ribs, anomalous ligament & hypertrophy of the scalenus anticus muscle.*

The patient were treated through supra clavicular approach by excision of cervical ribs together with fibrous band. Patient respond to this initial surgery and ultimately that patient become symptom free. In this study, various way of presentation of cervical ribs, etiology, different modalities of the treatment and their outcome has been discussed.

Introduction:

Cervical ribs occur commonly, but they are asymptomatic. A fibrous band as a variant of cervical rib often cause of symptoms than is an actual rib. The cervical rib is development of the 7th cervical vertebra more than 2.5 cm which is normal and symptomless. Here is a separate center of ossification for the costal part of its transverse process. It may take the form of a fibrous band stretching down to the first rib. It lies either behind or below the brachial plexus and vessels and exert pressure on them by movements of the upper limb. Sargent¹ remarked that if symptoms occur in a patient with bilateral cervical ribs, they are usually present on the side of the smaller rib. Symptoms are usually delayed until adolescence because pressure on the brachial plexus by the rib is not felt until a lowering of the shoulder girdle, which occurs about that age, takes place. It is seen especially in females who have an adolescent increase in weight of the shoulders and breasts. Symptoms are commoner in people with long necks and sloping shoulders than in those of square build. The rib is not as a rule palpable, and the larger it is the less commonly does it produce nervous symptoms.

The first unsuccessful resection of Cervical rib in a patient with thoracic outlet syndrome was performed by Coote in 1861¹⁰ In 1905 Murphy first made a successful resection of Cervical rib in the patient with thoracic outlet syndrome and he removed the first rib using supraclavicular approach for the first time. In 1927, Adson Coffey emphasized the role of ligaments, soft tissues and scalenus muscle in producing thoracic outlet syndrome and made the first successful resection of the scalenus anticus muscle¹¹.

Sensory loss is usually absent or slight and is the distribution of the ulnar nerve. Pain is usually worse at the end of the day and may be relieved by abducting the arm or holding it above the head. Vascular symptoms are due to compression of the subclavian artery between the clavicle and the cervical, rib or to irritation of the first thoracic root. They are not as common as nervous symptoms.

CASE HISTORY

A 19 years female, student, complaining of pain at right neck for 2 months associated with swelling of neck at right side. She also complaining of tingling sensation at the inner aspect of right upper limb.

The swelling of the neck was immobile, hard in consistency with well-defined margins.

She has pain with tingling sensation of the right inner aspect of right limb exacerbated during activities like writing, lifting weight. Pain is acute in onset, intermittent, dull aching and non-radiating.

On examination single swelling felt at the right cervical region which is hard in consistency, smooth surface, diffuse.

Adson's test was positive Elevated Arm Stress Test was negative

At operation the cervical rib was seen sticking up like an inverted wish-bone, articulating with the 7th cervical vertebra behind, and also with an upward projection of bone from the first rib in front. The subclavian artery and the lowest trunk of the brachial plexus were lying over its prominence. The artery was compressed but it was not dilated. The rib was resected together with its periosteum, which was removed to prevent any reformation of bone.

Post-operative recovery was good. For the first 2 days there was quite a lot of pain and numbness of the whole arm. The fingers soon lost their blueness and became warmer than they had been for many months. The power was good and there was good finer movements of the hand. The radial sensation returned in a few days as well as the ulnar sensation after the operation. She was symptom-free at last seen visit and holding magazines in her left hand at work caused her no discomfort.

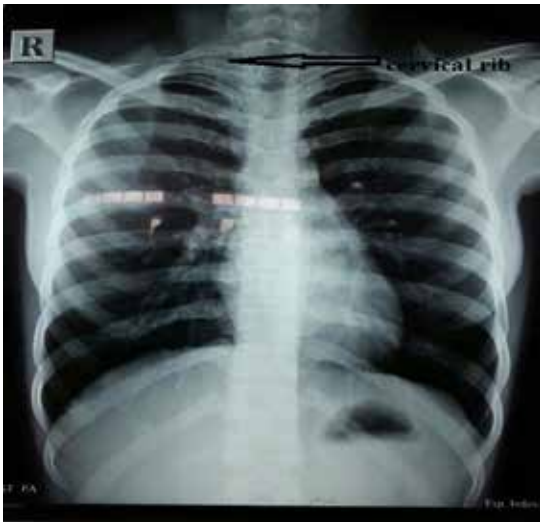


Fig 1: X-Ray view

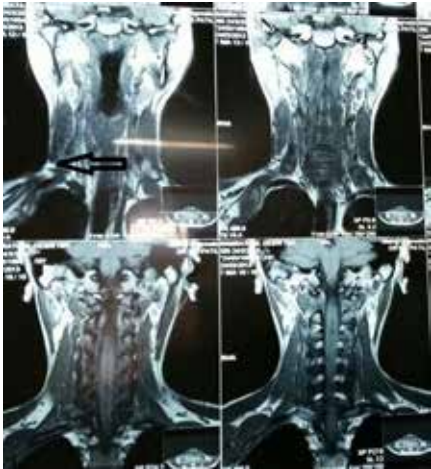


Fig. 2: MRI view



Fig. 3 : incision

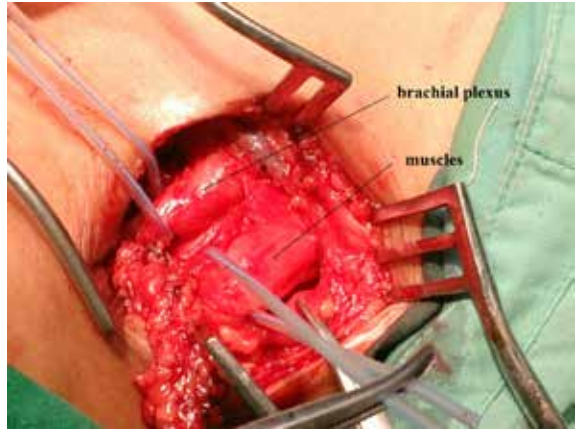


Fig.4:separation of muscle and brachial plexus



Fig.5: cutting of rib



Fig.6: closure



Fig 7: on follow up



Fig.8:follow up xray

DISCUSSION

The symptoms associated with a cervical rib must be distinguished from:

1. Ulnar neuritis, in which there is no shoulder pain, no thenar flattening, and no relief on abducting the arm.
2. Herniated cervical disc producing a radiculitis. This usually appears at a later age. X-ray may show a narrowed disc space. The pain is intense in the shoulder region.
3. Raynaud's disease.
4. Syringomyelia.
5. Writer's cramp, a hysterical manifestation with no clear clinical syndrome.

At first it was thought that the circulatory changes were caused by stretching or kinking of the subclavian artery over the cervical rib or by thrombosis within the artery, but Todd² advanced a theory of nervous origin of vascular changes in the hands. He showed anatomically that the lowest trunk of plexus was usually in closer apposition to the first thoracic rib or the cervical rib than the subclavian artery. He suggested that the changes in the arteries were trophic in nature and due to pressure causing paralysis of the sympathetic fibers which enter the arm in the lowest trunk of the brachial plexus.

These fibers are distributed to the peripheral vessels, and irritation of them induces spasm of the arterial wall, obliteration of. The vasa vasorum and eventually such changes in the health of the vessel wall as to lead to thrombosis and occlusion. He considered that the artery was too elastic a structure to be damaged by stretching over a cervical rib. Telford and Stopford³ supported these views and remarked that paralysis of the vasomotor fibers does not produce the vascular changes found in these cases. The pallor and coldness, they say, indicate vasoconstriction due to irritation of the sympathetic fibers. Lewis and Pickering⁴ pointed out that chronic irritation is usually followed by paralysis and that there was no allowance made for this in the theory. Todd's views were severely criticized by Falconer and Weddell⁵ on the grounds that the anatomy of the sympathetic supply to the upper extremity is not as described above, and that long-standing irritation of sympathetic fibers should lead to paralysis with vasodilatation, increased warmth, redness of the limb and loss of sweating (as happens in somatic nerves subjected to similar trauma). These writers suggest that momentary obliteration of the artery in certain movements of the shoulder would account for these vasomotor symptoms and would explain also their momentary duration. The artery is thought to be nipped between the clavicle and the cervical rib. Eventually there is thrombus formation on the intimal wall of the damaged artery and small emboli may be thrown off giving the vascular symptoms.

Costoclavicular compression is thus held to account for many of the pressure effects associated with cervical and even normal first ribs in relation to both vessels and nerves.

SUMMARY

A case of cervical rib is described in which main group of symptoms associated with this condition were shown, viz., sensory, motor. The rib was unusual in that it was complete, and had 2 articulations - one with the 7th cervical vertebra and the other with a projection of bone coming up from the first rib. Following removal of the rib, there was a marked relief of symptoms.

A brief review is given of the various theories about the symptoms associated with cervical ribs. So the sensory and motor changes are undoubtedly due to pressure effects on the brachial plexus as it is nipped between the clavicle and the rib.

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