

Case Report

CERVICAL RIBS-A REPORT OF TWO CASES

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ABSTRACT

The Thoracic Outlet is bounded by the first thoracic Vertebra posteriorly, superior border of manubrium sternum anteriorly, and the first rib and costal cartilage laterally. Thoracic outlet syndrome is a general term for a number of disorders producing neurovascular compression over this area. Cervical Rib is a congenital bony abnormality in which an extra rib is present superior to first rib is attached to C7 vertebra. Of the many factors which can cause neurovascular compression, 30% of the cases is due to bony abnormalities. Cervical rib is one of the important bony factors which lead to thoracic outlet syndrome due to the displacement and compression of the neurovascular structures while crossing the thoracic outlet to the upper limb. In the collection of bones in the Institute of Anatomy Madras medical college, cervical ribs were present bilaterally in two specimens. The present paper will definite be useful to clinicians while dealing with thoracic outlet syndrome.

KEYWORDS: Cervical Rib; Thoracic outlet; Thoracic outlet syndrome; Bilateral.

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INTRODUCTION

Vertebral column in the embryo grows faster than the spinal cord, nerves and plexus issuing from the latter assumes an oblique course to reach the extremities. They thus interfere with growth of ribs. Consequently in newborn in the cervical region it will be represented by the transverse processes of the vertebral bodies. The Cervical Rib may extend beyond the transverse process or even touch the first rib. It may reach the cartilage of first rib as either fibrous band or true cartilage. If the ribs attain sufficient length the subclavian artery or brachial plexus may be compressed between the angle formed by the rib and Scalenus anterior muscle giving rise to nervous or circulatory disturbances [1].

EMBRYOLOGY

Ribs vary in mammals from nine pairs in the bottle-nosed whale to 24 pairs in the two-toed sloth [2]. Snakes have Cervical and Lumbar ribs. Outgrowth of mesenchymal and neurogenic structures to the limb buds shear off the soft

uncalcified anlagen of the neck ribs during development. If the upper extremity descends too fast and too far, it shears off the upper thoracic ribs as well, if it descends too slowly, the seventh cervical rib is permitted to develop [3]. Vascular symptoms result from irritation of sympathetic fibres in the lowest trunk of Brachial plexus. The Distal parts of costal processes in seventh cervical vertebra which do not develop normally occasionally develop into cervical a rib [4].The costal element of the seventh cervical vertebra may be a mere epiphysis on its transverse process but more often has a head, neck and tubercle with or without a shaft extends into the posterior triangle of neck where it may end freely or join the first rib or costal cartilage or even the sternum which may be partly fibrous or osseous. Mutations in Hox genes have been shown to cause the development of cervical ribs from the costal or ventral processes of the primitive vertebral arches [5,6]. These can be associated with stillbirths and childhood malignancies [7,8].

CASE REPORT

Cervical Rib was present bilaterally in two specimens during routine scanning of collection of bones in the Institute of Anatomy Madras medical college. Relevant Anatomical details and measurements were taken using digital vernier caliper.



SPECIMEN-1

SPECIMEN-1 (Fig-1, Table-1):

The Length of cervical rib on right side was 5.8 cms, on left side cervical rib had both bony and fibrous part, bony part measured 3.2cms and fibrous part measured 5.3cms, total length including both parts on left side is 8.5cms.



SPECIMEN-2

SPECIMEN-2 (Fig-2, Table-2):

Length of Cervical Rib on Right side is 4cms, On Left side it is 6cms.

DISCUSSION

Cervical rib may be a fully formed bony rib or just a thin strand of tissue fibers, which will not always show up on any X-ray or MRI scans. If the extra rib is only partially formed, it may either end in a swelling that shows as a lump in the neck or it may tail off into a fibrous band of tissue

Width	Right side (mms)	Left side (mms)
Cervical Rib	6.91	4.25
1 st Rib	15.07	15.44
Combined	27.89	37.62

Table-1: Width at the place of crossing of Subclavian Artery, Brachial plexus.

Width	Right side (mms)	Left side (mms)
At Tubercle	12.18	14.24
Cervical Rib (where it will be crossed by subclavian)	4.49	6.77
1 st Rib (where it will be crossed by subclavian)	13.85	14.19
Combined Distance	23.21	26.75

Table-2: Width of the Rib.

that connects to the first proper rib. There is evidence to prove that long continued pressure of the cervical rib on the brachial plexus brings about a chronic aseptic inflammatory reaction which, if continued long enough, may bring about a permanent fibrosis [9]. The deformity is usually bilateral (twenty-four out of thirty-one cases) and is more common in women than in men (twenty-two females and nine males). The size of the cervical rib is not the index to the symptoms. It is estimated that only 10 per cent. of cervical ribs cause symptoms [10]. According to Schein et al. [11] A cervical rib is present in 0.5–0.7% of the population and appears more commonly in females than males, in a ratio of 2:1. Halstead (as cited by Connell et al. [12] was the first to report that when an artery is subjected to incomplete pressure an aneurysm develops distal to the point of pressure. Cervical rib fracture due to neck trauma is an extremely rare cause of TOS [13]. Isolated fracture of a cervical rib producing symptoms of thoracic outlet compression has been reported [14]. In the present two case reports the presence of cervical rib leads to angulation of subclavian artery which may lead to development of aneurysm, it may also can cause pressure over brachial plexus.

CONCLUSION

Such Anatomic variations like cervical rib are worthy to consider in cases of vascular disorders of the upper extremities, and with rational indications, exploratory surgery on this region would be warranted.

Conflicts of Interests: None

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