ISSN: 0975-3583, 0976-2833 VOL15, ISSUE7, 2024

Original Research Article

TO STUDY CERVICAL RIB-STUDY ON FEATURES AND INCIDENTAL FINDINGS AND CLINICAL CORRELATION

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Abstract

Background & Methods: The aim of the study is to Study cervical rib-study on features and incidental findings and clinical correlation.

Results: During the routine chest X-rays among the subjects presenting to medical college with the chief complaint of right hand or left hand pain weakness and tingling sensation. Some cases were asymptomatic came for routine chest X-ray, cervical rib was an incidental finding.

Conclusion: Observation revealed that the syndrome of cervical rib with subclavian artery thrombosis could lead to both right upper extremity and cerebral thrombo-embolism. The pathogenesis is believed to involve progressive narrowing of brachial artery. Cervical ribs may also be associated with spinal anomalies and their embryologic development is linked to conflicts between forming ribs and plexus. The management approach for thoracic outlet syndrome involves rib resection and an anterior approach.

Keywords: cervical, rib, incidental & clinical.
Study Design: Observational Study.

1. INTRODUCTION

A Cervical rib is an additional supernumerary rib that can develop near the base of neck. It arise from an abnormality in the development of the neck vertebrae, mostly arising from the lateral process of 7th cervical vertebrae. Cervical ribs can be unilateral or bilateral in the body ,they are not limited to one specific side[1]. X-rays taken in a certain plane may not always show a cervical rib due to the way it is positioned. The cervical rib typically consists of a head, neck, and tubercle. It is attached posteriorly to the first rib by a fibrous band near in the insertion of the anterior scalene muscle.

- Unilateral cervical ribs are found more frequently on the left side than the right side.
- Unilateral cervical ribs occur more frequently than bilateral cervical ribs.
- There is no physiological function of a cervical rib.

A congenital overdevelopment of the transverse process of a cervical spine vertebra is called a cervical rib, sometimes referred to as a neck rib or a supernumerary rib in the cervical region [2]. The seventh cervical vertebra gives rise to these anatomically rare ribs, which affect 0.5-1% of people [3]. It is present usually without any symptoms, but it may lead to vascular compression or thoracic outlet syndrome (TOS) [4]. Children with cervical ribs frequently exhibit no symptoms other than a neck lump and slight soreness. Cervical ribs can be unilateral or bilateral and differ in size, shape, and attachment sites. The majority of cervical ribs are clinically insignificant and go unnoticed throughout life. They may, however, occasionally result in localized discomfort and compress nearby structures, necessitating medical attention[5].

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Mutations in Hox genes and growth differentiation factor 11 (GDF11) genes have been thought to lead to abnormal development and patterning of ribs. Hox genes, a subset of homeobox genes, are a group of related genes that specify regions of the body plan of an embryo along the head-tail axis. Growth differentiation factor 11 (GDF11) also known as bone morphogenetic protein 11 (BMP-11) is a protein that in humans is encoded by the growth differentiation factor 11 gene. GDF11 is a member of the Transforming growth factor beta family[6]. During early development, the costal element of the developed mesenchymal cells located in the incorrect place usually atrophy but when they fail to do so, they become ossified and present as an elongated transverse process or a complete rib. However, in some cases, it may be too small to reach the sternum and fuses anteriorly with T1 below the first rib[7].

2. MATERIAL AND METHODS

An observational study was conducted using chest radiographs, by using convenient sampling method to study the incidence and morphology of cervical ribs. Consecutive 500 chest radiographs were used which included both sexes, and from all age groups between 12 and 80 years were studied who presented to the Department of Radiology, Govt. Medical College, Sangareddy.

Inclusion Criteria:

1. Radiographs belonging to both the sexes from age groups between 12-80 years were included in the study.

Exclusion criteria

1. Radiographs with incorrect patient positioning and fracture of rib, any other associated rib anomalies were excluded from the study.
2. Cervical ribs were identified based on the articulation with transverse process of the vertebra. They were termed as complete cervical rib, when its posterior end articulates with transverse process of C7and anterior end articulates with first rib or its cartilage; and was termed as incomplete when the anterior end was free.

Fig 1: Unilateral Cervical Rib

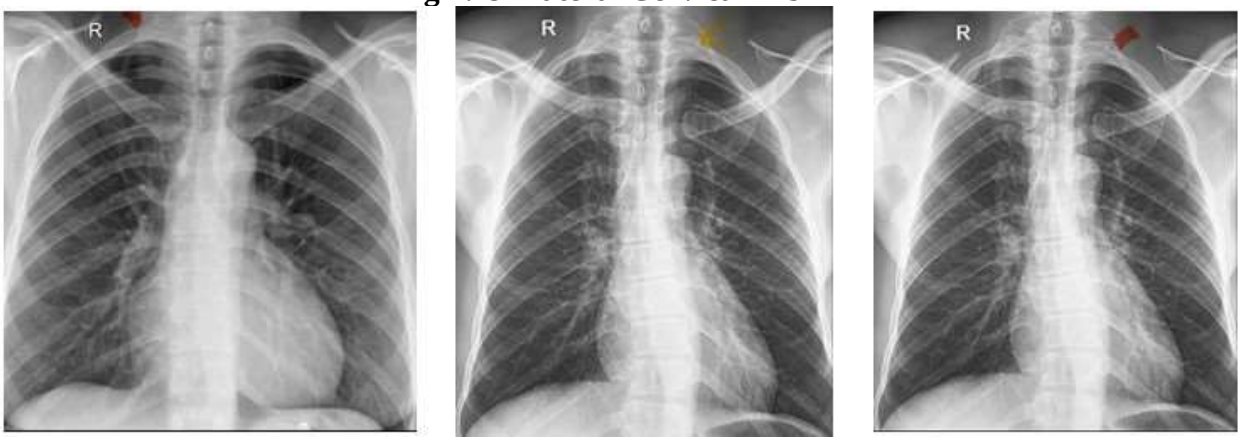

Fig 2: Bilateral cervical Rib

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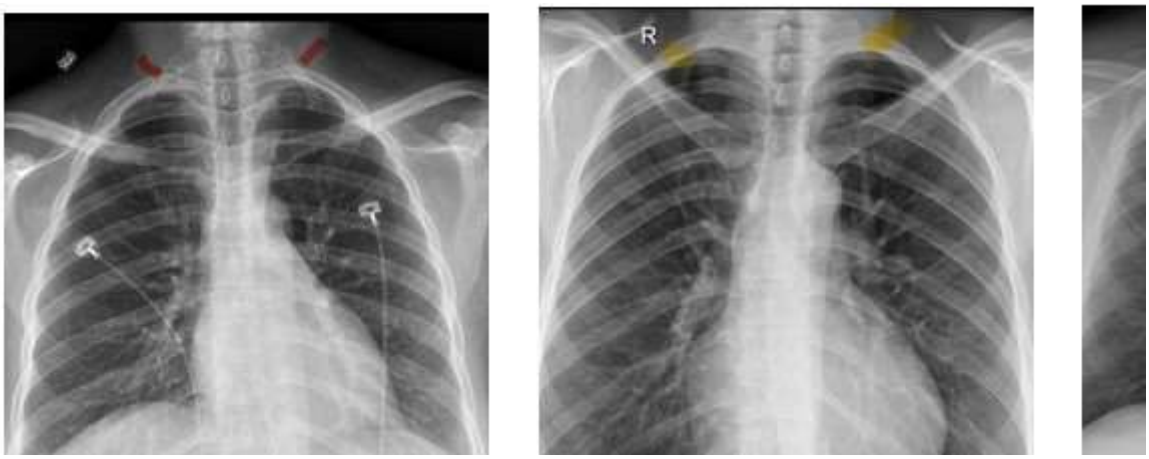

3. RESULT

Table No. 1: Mean Age

Age	Mean	SD
Male	33.2	1.87
Female	31.7	2.33

Table No. 2: Sex Incidence of Cervical Rib

S. No.	Sex incidence of cervical rib No. (%)	Absent N (%)
1	Male 03 (0.92%)	322 (99.08%)
2	Female 05 (2.85%)	170 (97.15%)
	08	492

Table No. 3: Bilateral / Unilateral

Right side	Left side	Bilateral / Unilateral	Total
06	Nil	Unilateral	325
06	03	Bilateral (3) Unilateral (6)	175
			500

- 500 X-rays were performed out of them 08 X-rays had an incidental finding of cervical rib.
- During the routine chest X-rays among the subjects presenting to medical college with the chief complaint of right hand or left hand pain weakness and tingling sensation.

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- Some cases were asymptomatic came for routine chest X-ray, cervical rib was an incidental finding.

4. DISCUSSION

Incidence of cervical rib in the present study was 1.75% however the incidence of cervical rib in females (1.55%) was higher compared to males (0.22%). Usually, cervical ribs are asymptomatic[8].

Cervical ribs can become symptomatic due to their close anatomical relation to the inter scalene triangle where they can compress the neurovascular structures such as the brachial plexus or subclavian artery by narrowing the boundaries of the triangle. Complete cervical rib can cause serious neurovascular symptoms compare to the incomplete cervical rib[9].

Which includes pain and weakness in the upper limb and of the muscles of hand and forearm. Discolouration of the skin of the hand, claudication, dizziness, diminished distal pulses at wrist, prolongation of capillary refill. Systolic blood pressure will be decreased, and patient may present with subclavian artery thrombosis as a presenting feature[10]. The subclavian vein compression could lead to subclavian venous thrombosis or more dangerous life-threatening pulmonary embolism[11].

Cervical rib symptoms are mostly similar to the cervical spondylitis. Symptomatic cervical rib can be treated conservatively by physical therapy. When conservative methods fail, surgical resection of the cervical rib is indicated[12]. If adequate decompression of the subclavian artery and brachial plexus is still not achieved then, resection of first rib along with cervical rib resection.

5. CONCLUSION

Observation revealed that the syndrome of cervical rib with subclavian artery thrombosis could lead to both right upper extremity and cerebral thrombo-embolism. The pathogenesis is believed to involve progressive narrowing of brachial artery. Cervical ribs may also be associated with spinal anomalies and their embryologic development is linked to conflicts between forming ribs and plexus. The management approach for thoracic outlet syndrome involves rib resection and an anterior approach.

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ISSN: 0975-3583, 0976-2833 VOL15, ISSUE7, 2024

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