

*Case Report***A Rare Case of Anterior Chest Wall Deformity**

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*Received: 07/03/2014**Revised: 02/04/2014**Accepted: 12/04/2014***ABSTRACT**

**Back ground:** Anatomical variations in the anterior chest wall are a rare entity. In the previous studies based on chest radiographs, its incidence has been reported around 0.3%. They are usually asymptomatic.

**Material:** Human male cadaver aged about 70 Years, received for demonstration dissections to the medical students provided the material for study

**Results and observations:** The present case reports about the following variations of the left side chest wall. Synostosis of fourth and fifth costal cartilages and bridge formation between sixth and seventh ribs near their costochondral junction. Bifid third rib was present with its bifurcation point near its costochondral junction. The additional intercostal space is too small for the muscles to be distinguished.

**Conclusion:** Precise knowledge about these variations is necessary for the clinicians, as these abnormalities detected in the ribs can sometimes be the initial indication of systemic diseases and also helps to avoid confusion during counting of ribs.

**Key words:** synostosis, bifid rib, costochondral junction

**INTRODUCTION**

During development sclerotome cells in the paraxial mesoderm develop into costal process of the thoracic vertebra. The costal process develops into bony part of the rib and costal cartilages are developed from the sclerotome cells that migrate across the lateral somatic frontier into the adjacent lateral plate mesoderm. <sup>[1]</sup>

Synostosis of the intra thoracic ribs can be divided into three types:

**Bicipital rib:** The posterior ends are separate but their anterior ends and shafts are fused.

**Bridged rib:** Their anterior and posterior ends are separate but shafts are fused.

**Forked rib:** The posterior ends are fused but shafts of the ribs and their anterior ends are separate. <sup>[2]</sup>

Usually these types of variations are clinically insignificant. They are occasionally palpated during clinical examinations or incidentally detected in chest radiographs but sometimes they may indicate underlying systemic disease. <sup>[3]</sup>

**CASE REPORT**

During routine dissection for medical students in Department of Anatomy, Mamata Medical College, Khammam, left sided anterior chest wall variation was observed in an adult male cadaver aged about 70 years.

The specimen was examined in detail and morphological measurements were recorded.

There was a fusion of third and fourth costal cartilages on the left side leaving a gap of length 0.5cm and breadth 0.6cm. The muscles in the gap were indistinguishable.

Bifid third rib was present enclosing an additional intercostal space. Its bifurcation point was near its costochondral junction. The dimensions of the additional space were about 0.7cm in transverse length and 0.8 cm in vertical length.

The intercostal space between second and third costochondral junction was 1cm and intercostal space between third and fourth costochondral junction was 3.2cm. The muscles in the additional intercostal space could not be differentiated clearly.

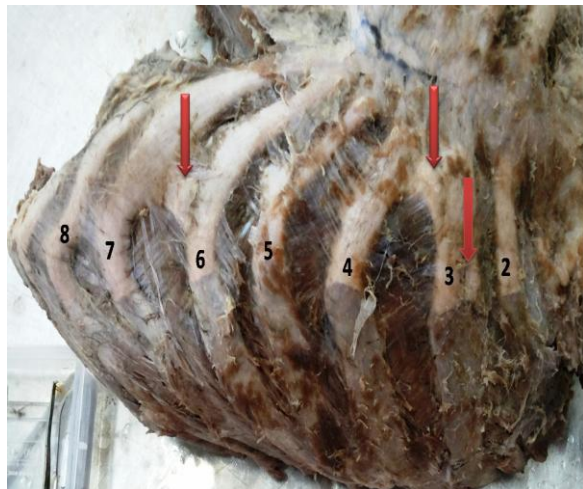


Figure No.1, Showing bifid 3<sup>rd</sup> rib, fusion between 3<sup>rd</sup> & 4<sup>th</sup> costal cartilages and bridge formation between 6<sup>th</sup> & 7<sup>th</sup> costal cartilages.

There was a bridge formation between sixth and seventh costal cartilages. The transverse distance of the bridge was 5.6cm from the lateral margin of the sternum and muscles present between them were clearly defined. They were innervated by sixth costal nerve. The lateral end of the bridge was 1 cm from the 6<sup>th</sup> costochondral junction and 3.5cm from the 7<sup>th</sup> costochondral junction.(Figure No.1)

## DISCUSSION

Congenital anomalies of ribs can be classified into numerical and structural. Structural abnormalities comprise short ribs, bifid rib, fused or bridged ribs and pseudoarthrosis of first rib. Numerical anomalies consist of supernumerary ribs like cervical, lumbar, pelvic or sacral and deficient pairs like 11 pairs. [4]

Malexpression of some myogenic determination factors such as Myo D, myogenin, Myf 5 and MRF 4 could be the potential cause of such anomalies which are detected in the medial half of somites prior to the myotome formation. [5]

Lutz has first described about intrathoracic rib in 1947in about 40 cases. Wu-chul song, et al reported three cases of bifid ribs in a cadaveric study. [6]

Santhosh Chandrappa Siddappa et al reported bifid third rib in an autopsy of sixteen year old male.

Bifid intrathoracic ribs are more frequent in males than females. They occur most commonly in the right third and fourth ribs. Presence of bifid ribs can be found incidentally in the chest radiographs. [7]

In the present case bifid third rib with its bifurcation point near its costochondral junction was observed on the left side of chest wall.

Synostosis of the sternal ends of ribs may take place in the old age due to ossification spreading into and from the costal cartilages. Long-standing collapse of the lung or lesions of the intrathoracic contents can be the cause for the fusion of the ribs at their vertebral ends. [8]

Seema Deepak et al reported synostosis of ribs between the anterior ends and shafts of 1st and 2nd ribs of right side. [4] According to Baumgarlner F et al fusion of first and second ribs is associated with thoracic outlet syndrome. [9]

There are about 22 syndromes described in the literature, in which

variations in the anterior chest wall is one of their regular components. For instance Klippel-feil syndrome, Jarco-levin syndrome, Poland syndrome and Gorlin syndrome are few examples. [10]

Present case report about fusion of fourth and fifth costal cartilages and bridge formation between sixth and seventh ribs near their costochondral junctions.

## CONCLUSION

Variations in the anterior chest wall may indicate underlying systemic disease. Fusion of the ribs can cause confusion during counting of ribs and sometimes nerve entrapment in the intercostal space with restriction of chest wall expansion which may require surgical correction. Awareness of such variations is necessary for physicians and surgeons during clinical diagnosis and treatment.

## ACKNOWLEDGEMENTS

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

**Competing Interests:** The authors declare that we have no competing interests

**Ethical Committee Clearance:** As the study included only human cadavers, ethical committee clearance was not taken into consideration. Authors will take the responsibility of any further allegations regarding ethical clearance that arise from the study.

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How to cite this article: Murali KS, Rajesh V, Udaya KP et. al. A rare case of anterior chest wall deformity. Int J Health Sci Res. 2014;4(5):328-330.

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