

Case Report

An Anatomic Abnormality: Double Sternal Foramina

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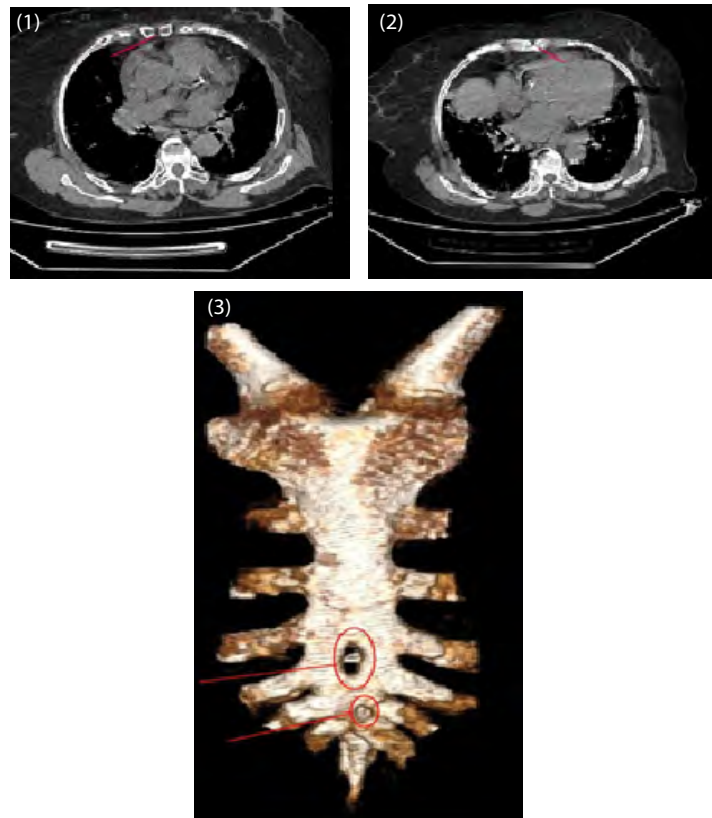


Figure 1: Thorax CT scan of upper foramina.

Figure 2: Lower foramina.

Figure 3: 3D reconstruction.

Abstract

Sternal foramina are developmental defects of the sternum. The incidence of sternal foramen is about 4.5% of population. They can be found usually coincidentally by radiological or postmortem examinations. In this case report, I represent an 84 years old woman with pulmonary contusion after blunt trauma who has double hole in her sternum detected by radiological examinations.

Keywords: Sternum; Sternal foramen; Anatomic abnormality

Introduction

The sternum is a flat shape bone which is located in the middle of anterior thorax. It has three parts including manubrium, body and xiphoid cartilage [1]. Embryological development of sternum starts from sternal bars of ventrolateral body wall until

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the mid-line and bar fusion finishes with the formation of xiphoid [2]. Sternal foramen (or perforated sternum) is a developmental defect and a result of the incomplete fusion of the sternal bar in the middle. The rate of sternal foramen is 4.5% (range 4.3-6.7%) of the population and usually located on inferior sternal body. Also it can be located on xiphoid part [3].

Case Report

An 84 year old woman was admitted to thoracic surgery department with chest pain caused by thoracic blunt trauma. Diffuse pulmonary contusion and two sternal foramina as a measurement of 7.5 mm at upper and 5 mm at lower detected by Thorax CT scan and 3D reconstruction (Figures 1-3). Pulmonary rehabilitation and analgesia therapy applied. The patient got discharged after 4 days.

Discussion

Variation and anomalies of sternum is common. These malformations and anomalies are detected coincidentally by radiological examinations and postmortem. Any failure in the embryogenic process causes sternal anomalies, such as fissures or foramen. The incidence of sternal foramen evaluated as 4.3% - 6.6%-6.7% in different studies [3-5]. Others reported that developmental variations of sternum includes branched xiphoid process, V shaped bifurcation, sternum bifidum, synchondrosis sternii (incomplete ossification of the sternum), anomalies in the shape of the sternum (wedge shaped or asymmetrical bone), sternum gallinaceum and sternal foramen.

Cooper detected sternal foramina in 6.7% in autopsy population that were usually solitary and located in the body of the sternum. They also detected a foramen in the manubrium. Also Moore detected 6.6% sternal foramina in an autopsy population. Yekeler evaluated the frequency of sternal foramens by MDCT in 4.5% of 1000 patient. The size of sternal foramina ranged between 2 and 16 mm in these case series [3-5] and in our case the upper foramen was 7.5 mm and lower was 5 mm. They were both located in the body of sternum.

Patients with sternal foramen have the risk of spontaneous pneumothorax or pericardium tamponade during sternal biopsy or acupuncture [6]. As conclusion sternal foramen is the most common variation of sternum and mostly symptomless. It has to be kept in mind because of the serious complications after sternum biopsy and acupuncture.

References

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