

# CASE REPORT

## STERNAL FORAMEN: A CASE REPORT

Taqdees Fatima<sup>1</sup>, Vanitha Sanjeev<sup>2</sup>, Md. Khaleel Ahmed<sup>3</sup>

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**ABSTRACT:** Sternal foramen is a congenital oval defect at the lower third of the sternum that is usually asymptomatic & occurs due to incomplete fusion of multiple ossification centres. During our routine osteology classes, a sternum with a foramen in the lower part of its body measuring about 11mmx10mm was found. Knowledge about such variation is important as it has risk of life threatening complications like pneumothorax or even pericardial or cardiac puncture during sternal biopsy or acupuncture.

**KEYWORDS:** Sternum, Foramen, Mesosternum, Pneumothorax, Pericardium.

**INTRODUCTION:** The sternum is formed by fusion of two cartilaginous sternal plates flanking the median plane. The arrangement and number of centres of ossification vary according to the level of completeness and time of fusion of the sternal plates, and to the width of the adult bone. Incomplete fusion leaves a sternal foramen.<sup>1</sup> Mesosternum (body) ossifies from 4 sternebrae. Sternal foramen of varying size and form may occur between third and fourth sternebrae due to incomplete fusion.<sup>2</sup> The clinical importance of this type of defect lies in the potential hazard when a puncture is performed in this region. Serious complications following sternal puncture for bone marrow biopsy,<sup>3</sup> or acupuncture,<sup>4</sup> have been reported in the literature.

**CASE REPORT:** During the routine osteology class for the 1<sup>st</sup> phase MBBS students in the department of anatomy ESIC medical college, Kalaburagi, a sternum with a foramen in the lower part of its body was found. Dimensions of the foramen were 11mm in length and 10mm in width as measured by the digital caliper



**Fig. 1: Sternum showing a foramen in lower part of its body**

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**DISCUSSION:** The embryologic development of the sternum starts from a pair of band-like concentrations of mesenchymal cells on each side of the midline. These structures convert into precartilaginous and fuse at the midline in a cephalocaudal direction. Following the maturation into cartilage the sternum undergoes several transverse divisions into a series of cartilaginous segments, called sternabrae. The ossification nuclei form in the centres of the separate cartilages, and it is not uncommon for these to be paired in all or some of the sternabrae. If their fusion is inhibited the result will be respectively a cleft sternum or sternal foramen.<sup>5</sup> Sternal foramen is a congenital oval defect at the lower third of the sternum that is asymptomatic.<sup>6</sup> Sternal foramina are found usually in the lower part of the body of the sternum and are usually solitary. Variants such as multiple mesosternal foramina and a manubrial foramen also have been described.<sup>7</sup> The clinical importance of this type of defect lies in the potential hazard when a puncture is performed in this region. Serious complications following sternal puncture for bone marrow biopsy,<sup>3</sup> or acupuncture,<sup>4</sup> have been reported in the literature. Fatal cardiac tamponade following sternal puncture in the inferior part of the sternum with a congenital sternal foramen was reported. Oblique radiographs may show evidence of sternal foramen but superposition of mediastinal structures may partially obscure the abnormality. Helical or Multislice CT imaging best shows bone structures without superimposition, and is the imaging modality of choice to confirm the diagnosis.<sup>8</sup> Sternal foramina can also be misinterpreted as osteolytic lesions in cross-sectional imaging of the sternum.<sup>9</sup>

**CONCLUSION:** Knowledge about sternal foramen, its presence, location & and its dimension is important as it has risk of life threatening complications like pneumothorax or even pericardial or cardiac puncture during sternal biopsy or acupuncture. When sternal puncture is planned in corpus sterni region, radiographs should be taken to rule out this variation to avoid fatal complications. Helical or Multislice CT can be used to make the accurate diagnosis.

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## **AUTHORS:**

1. Taqdees Fatima
2. Vanitha Sanjeev
3. Md. Khaleel Ahmed

## **PARTICULARS OF CONTRIBUTORS:**

1. Assistant Professor, Department of Anatomy, Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi, Karnataka, India.
2. Tutor, Department of Anatomy, Employee's State Insurance Corporation Medical College, Kalaburagi, Karnataka, India.
3. Assistant Professor, Department of Anatomy, Khaja Banda Nawaz Institute of Medical Sciences, Kalaburagi, Karnataka, India.

## **NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Taqdees Fatima,  
Plot No. 90, M. G. Road,  
1<sup>st</sup> Left Cross,  
Sangtarashwari,  
Kalaburagi-585103.  
E-mail: taqdees.fathima@gmail.com

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