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Trapped Heart with Overlying Chest Wall Deformity and Sternal Defect

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Keywords: CT angiography, Sternal foramen, Pectus excavatum

An elderly male was referred for CT coronary angiography for evaluation of atypical chest pain. It showed no significant coronary artery disease. However, severe pectus deformity of chest wall was seen causing marked reduction of antero-posterior diameter of thorax (Haller's index-6.62) with associated mediastinal shift to the left. Additionally, sternal foramen was noted at the caudal segment of corpus sternum with direct visualization of right atrial appendage and the right coronary artery coursing through the atrio-ventricular groove immediately beneath the foramen (Fig. 1).

Sternal foramen, an anatomical variant, may render the underlying important structures including lungs, heart, and their protective coverings (pleura, pericardium) vulnerable to injury due to trauma or any needle placement procedure. It is important to highlight that physical examination may be unremarkable as the foramen is generally occupied with

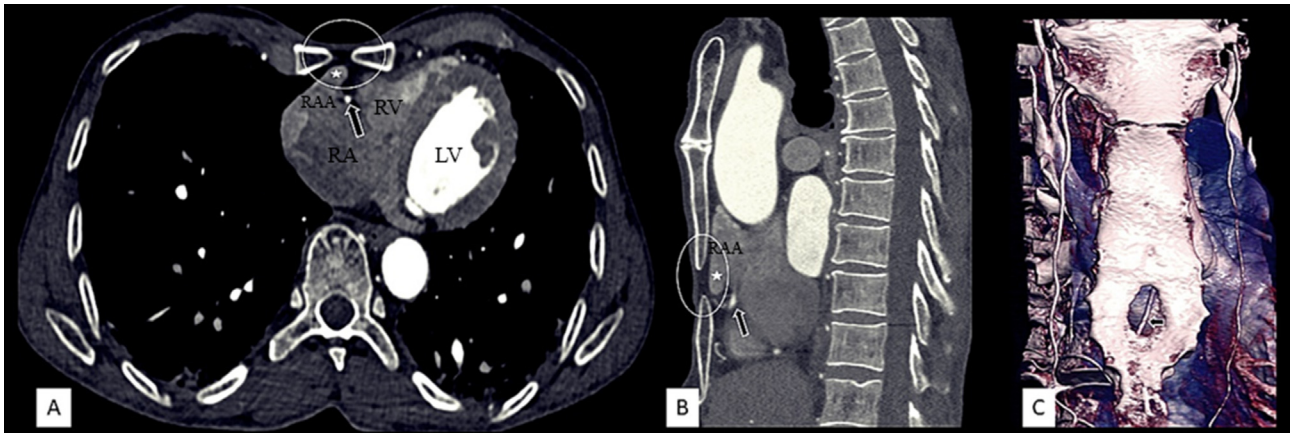

Fig. 1. CT angiography images (1A-B) showing sternal foramen (white oval outline), with finger like projection of right atrial appendage (asterisk), and right coronary artery in atrio-ventriclar groove (arrow) lying immediately posterior to it. There is significant reduction in antero-posterior diameter of chest (Haller Index 6.62). Volume rendered image (1C) coronal projection showing the sternal foramen at caudal part of corpus sternum with visualization of right coronary artery (arrow) posterior to it. RA-right atrium; RAA-right atrial appendage; RV-right ventricle; LV-left ventricle.

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dense fibrous tissue. It assumes far more greater importance with coexisting pectus excavatum, as seen in the index case, where the important cardiac or extracardiac structures may lie crowded immediately beneath the foramen including the right coronary artery which comes more to midline with rotation of the mediastinum to the left.

Authors contribution

Conception and design of Study: MM, AS.

Literature review, drafting of manuscript, revising and editing the manuscript: MM, AS, ND, MS.

Conflict of interest

The authors declare no conflict of interests.