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CLINICAL SPOTLIGHT

Giant Hernia of Morgagni with Acute Coronary Syndrome: A Rare Case Report and Review of Literature

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Hernia of Morgagni is a congenital defect of the sternal part of the diaphragm and frequently presents on the right side of the midline. The hernial sac is usually small and can be dealt with through either an abdominal approach or through a lateral thoracotomy incision. Median sternotomy as an approach to repair these defects has very rarely been described in the literature when concomitant cardiac surgical procedures were required. We report the case of a 42 year-old male with Morgagni hernia that was approached through median sternotomy because of concomitant requirement for open heart surgery. The patient presented with acute coronary syndrome necessitating urgent coronary artery bypass surgery and was found to have a giant hernia of Morgagni due to bilateral defects. This entity is very rarely described and may pose difficulty in repair due to excessive adhesions to the surrounding thoracic or mediastinal tissues. Median sternotomy seems to be the ideal approach to deal with these giant lesions. Clinical presentation of Morgagni hernia and different options for surgical repair of the defect are discussed with reference to relevant literature.

Keywords Congenital diaphragmatic hernia • Morgagni hernia • Acute coronary syndrome • Coronary artery bypass surgery • Herniorrhaphy

Introduction

Congenital diaphragmatic hernia of Morgagni is a rare disease caused by the defective development of the sternal attachments of the diaphragm. It is found more commonly on the right side of the midline (passing through the cleft of Morgagni) than on the left side (passing through the cleft of Larrey) as the left side is protected by the pericardium [1]. Bilateral defects have also been described [2,3]. The incidence of Morgagni hernia is 2-5% of all congenital diaphragmatic defects [1,2]. The condition is usually discovered in older children or adults as an incidental finding on chest radiography or after becoming symptomatic due to recurrent chest infections [2], visceral obstruction [1] or restrictive breathing [4,5]. These diaphragmatic defects have a high incidence of associated congenital anomalies including neural tube defects, congenital heart defects, intestinal rotation anomalies, chromosomal abnormalities such as trisomy 13, 18 and 21 and pectus excavatum [7].

Giant hernia of Morgagni is a very rare entity and only a few cases have been described in the literature [4–6,10]. We are reporting a rare case of giant hernia of Morgagni occupying the anterior mediastinum that was discovered as an incidental finding just before urgent coronary artery bypass surgery and was repaired as a combined procedure through a median sternotomy approach.

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Case Report

A 42 year-old male patient presented to the emergency room with chest pain and elevated cardiac enzymes and was admitted with a diagnosis of non-ST-elevation myocardial infarction. His risk factors for ischaemic heart disease included hypertension, hyperlipidaemia, morbid obesity and smoking. Double-vessel coronary artery disease had been diagnosed on coronary angiography nine years earlier, when he had presented with exertional angina and a positive exercise tolerance test. He had been advised to undergo coronary artery bypass grafting during that admission but he had declined surgery. Past history included prolonged dyspeptic symptoms, chronic constipation and blunt trauma to the abdomen from a camel kick.

After stabilisation of his condition, coronary angiography was repeated and it revealed total occlusion of left anterior descending artery (LAD) and critical stenosis of posterior descending artery (PDA). Circumflex artery arising from a separate osteum had mild disease. His echocardiogram showed good left ventricular systolic function with ejection fraction of 55%. The patient was referred for urgent coronary artery bypass surgery and agreed to undergo operative treatment. Pre-operative review of his chest X-ray revealed a large opacity in the right chest cavity containing gas-filled loops of bowel [Fig. 1]. A CT scan of the chest was requested and it revealed massive herniation of loops of colon and omentum into the anterior mediastinum through a bilateral Morgagni-Larrey defect in the anterior border of the diaphragm [Fig. 2]. The hernia was occupying a large space in front of the pericardium and the heart and the great vessels were pushed posteriorly and into the left chest. A prominent loop of the transverse colon was lying just under the posterior table of the sternum separated by a thin layer of the sac [Fig. 2 (B)].

The patient underwent a combined procedure of the repair of hernia of Morgagni and coronary artery bypass grafting (CABG). Pre-operative bowel preparation was carried out and nasogastric tube was passed to decompress the stomach. The hernial sac was dissected free from the under-surface of the sternum before opening the sternum with an oscillating saw. A huge sac of the hernia was found adherent to the anterior mediastinal tissues and extending laterally into both chest cavities. The sac was fully dissected from the surrounding tissues all the way down to its neck. The sac was, then, opened and the adhesions between its contents and its wall were divided. The contents were reduced back into the abdominal cavity and the redundant tissue of the sac was excised. There was an oblong defect in the diaphragm about 15 cm long and 8 cm wide extending on both sides of the midline [Fig. 2 (A)]. The edges of the defect were defined and the defect was repaired using 1 mm thick Poly-tetra-fluoro-ethylene (PTFE) fabric graft (Gore-Tex) reinforced with multiple patches of PTFE mesh. The anterior mediastinum was thoroughly washed with normal saline before opening the pericardial cavity. Saphenous vein graft to PDA and left internal mammary artery graft to LAD were carried out uneventfully.

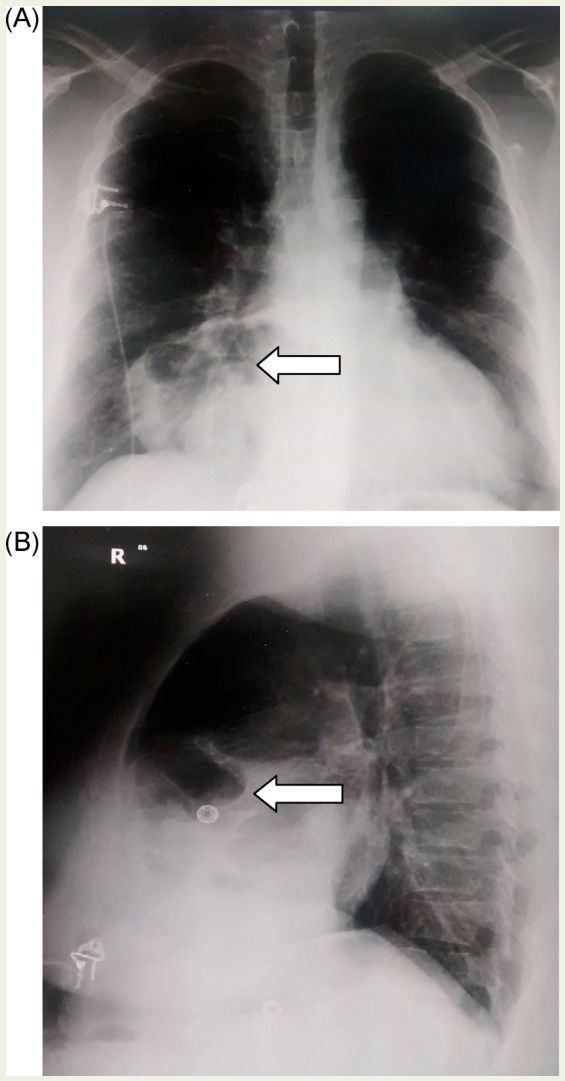

Figure 1 Antero-posterior (A) and lateral (B) chest radiograph showing loops of bowel in the anterior mediastinum.

The patient made a smooth post-operative recovery. He has been followed up at our institution for two years after surgery and remains asymptomatic with no evidence of recurrence of hernia.

Discussion

Diaphragmatic hernia of Morgagni is caused by deficient development of the sternal part of the diaphragm which originates from septum transversum and is attached to the posterior aspect of xiphoid process and the posterior sheath of both rectus abdominus muscles. It was first described in 1769 by the Italian anatomist Giovanni Battista Morgagni as an autopsy finding in his book 'From Causes Morborum et sedibus' [8]. Later, in 1829, Napoleon's surgeon Larrey precisely described the left sterno-costal trigon and thus, in