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Pericardial effusion as a rare complication of a perforated appendicitis



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ABSTRACT

INTRODUCTION: Whilst pericardial effusion is a known complication of abdominal pathology, it is rarely reported following ruptured appendicitis and even more rarely requires drainage in that situation. This work has been reported in line with the SCARE criteria (Agha et al., 2016).

PRESENTATION OF CASE: We report a 14-year-old male who developed extensive right hepatorenal and right paracolic abscesses, bilateral pleural effusions and a large pericardial effusion following laparoscopic appendicectomy. Due to the size of the effusion, thoracoscopic pericardiotomy was required.

DISCUSSION: Pericardial effusion is a very rare complication of advanced appendicitis despite a demonstrable connection between the retroperitoneum and the mediastinum. Only two cases were reported in our literature search. There is no consensus as to whether percutaneous drainage or pericardiotomy is the treatment of choice.

CONCLUSION: The report is presented as a reminder of a rare complication of a common general surgical condition.

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1. Case

The index case was a 14-year-old boy transferred from a regional hospital to our unit 24 h after a laparoscopic appendicectomy for perforated appendicitis.

He was febrile and tachypnoeic. Abdomen was distended and tender with purulent discharge coming from a peritoneal drain. Chest X ray demonstrated extensive right pleural effusion (Fig. 1). Fluid resuscitation and aggressive broad-spectrum antibiotics were commenced and a pleural drain was placed with improvement in his respiratory status.

The intraperitoneal drain was inadvertently removed and some days later he became febrile again. Abdominal computed tomography (CT) showed multiple locules in an extensive right-sided abdominal collection extending from the subhepatic space to the iliac fossa (Fig. 2). Non-operative management with intravenous antibiotics failed to resolve all of these and a laparotomy was performed with drainage of all except a small subhepatic collection. A large sump drain was left in-situ and, following cessation of drainage and a satisfactory clinical state, he was discharged.

Five days later, he re-presented with severe left pleuritic chest pain and dyspnoea. He was noted to have a high fever and pericardial rub on auscultation. Bilateral pleural effusions and a large high attenuation pericardial effusion were noted on imaging (helical CT and echocardiography) (Figs. 3, A, B, 4). A previously demonstrated

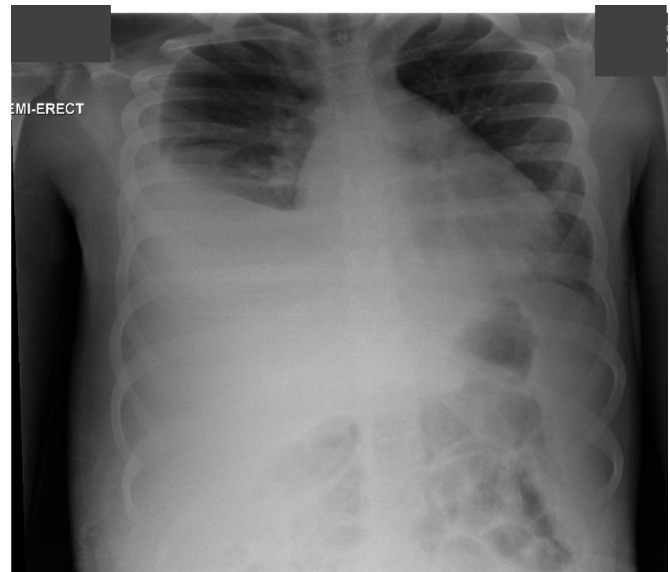


Fig. 1. Chest X ray on admission. This study demonstrated an extensive right pleural effusion with shift of the mediastinum towards the left side. There was also collapse consolidation of the right lower lobe.

small right subphrenic collection had increased in size. Due to the size and possible infective nature of the pericardial effusion, cardiothoracic opinion was sought and thoracoscopic pericardiotomy was performed draining approx. 600 mls of haemoserous fluid into

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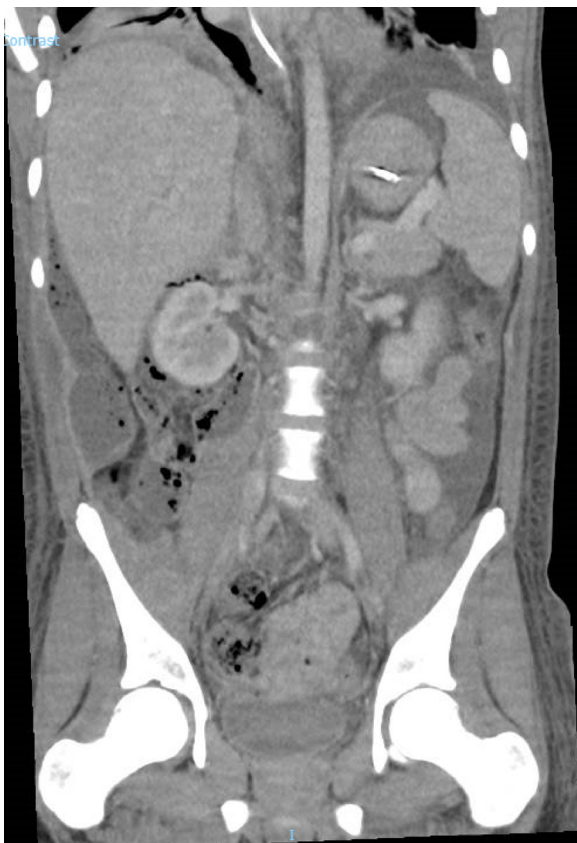


Fig. 2. CT scan with IV contrast medium. This study demonstrated multiple small locules of gas in the right side of the abdomen, which extended from the subhepatic space to the right iliac fossa.

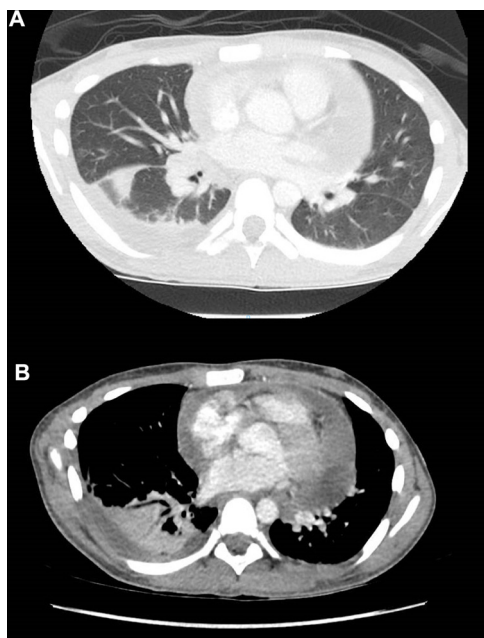


Fig. 3. A (Top) and Fig. 3B (Bottom). Helical CT with lung and body windows respectively. This study demonstrated a large pericardial effusion. The pericardial fluid had a slightly higher attenuation compared with the right-sided pleural fluid, which suggests probably infective component or some underlying haemorrhage. The complex right subphrenic collection had increased in size compared with the previous CT and measures $9 \times 4 \times 5$ cm. This collection ran anteromedially to the midline and the diaphragm and could potentially be a source of communication with the pericardium.

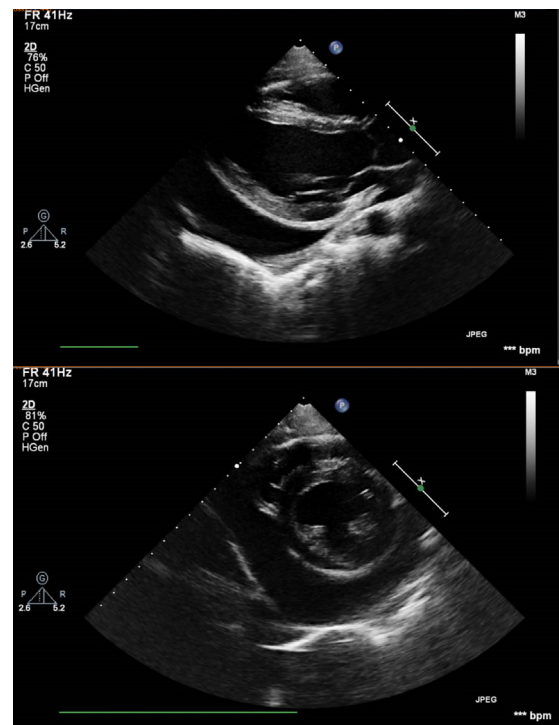


Fig. 4. Transthoracic echocardiogram with complete 2D, M-Mode and Doppler examination.

This study demonstrated a large pericardial effusion with no evidence of major haemodynamic compromise. The pericardial fluid appeared clear and was not organized. The patient had a loud pericardial rub on examination. The majority of the pericardial collection was posterior.

the right pleural space. The pericardial effusion was microscopically analysed revealing profuse polymorphs and profuse gram negative rods, gram positive cocci and gram positive rods. The culture of the effusion grew enteric gram negative rods and mixed anaerobes, of which *Streptococcus Anginosus* (*S. Milleri*) was isolated.

His clinical condition improved significantly and the drain was removed on the second post-operative day. He subsequently had a laparotomy to drain the subhepatic collection.

2. Discussion

Pericardial effusions in adults are most commonly idiopathic, followed by infection and malignancy [2–4]. Rarer causes include radiation, uraemia and post-acute myocardial infarction [1]. In paediatric cases, the leading causes are infective pericarditis, connective tissue disease, metabolic disorders and malignancies [5].

We searched the NCBI PubMed and Medline database for English literature from 1946 to present to determine the frequency and management of pericardial effusion as a complication arising from acute appendicitis. This delivered a total of 5 case reports. However, after reviewing the papers for their relevance to this case, only two case reports remained. Kao et al. [6] reported a 3-year-old girl with a perinephric abscess extending from a ruptured Appendix and subsequent empyema and pericardial effusion – both treated by percutaneous drains. Pery et al. [7] reported an adult with a perinephric abscess complicated by a retroperitoneal-pericardial fistula. The subsequent purulent pericardial effusion was drained by retrosternal pericardiotomy with subsequent pericardiectomy required.

Up to 55 per cent of children with advanced appendicitis develop a complication such as intraabdominal and pelvic abscesses or bowel obstruction [8]. Vilaça et al. [9] demonstrated the anatomical connections between the retroperitoneum and the mediastinum by

depicting ectopic air from radiographs and suggested these connections as providing pathways for bidirectional spread of disease processes into the mediastinum and pleural cavities. Our case had no known additional connections.

The European Society of Cardiology guidelines recommend surgical drainage over percutaneous drainage in complicated purulent pericarditis [10]. A case series from Northern India reported 25 cases of pericardial effusions in children over three years. No cases of intraabdominal infections were found and nine cases were complicated by cardiac tamponade. Echo-guided percutaneous drainage and pigtail catheter insertion were found to be safe and effective treatments. Contrary to the guideline previously mentioned, this case series calls into question the need for surgical drainage in the treatment of complicated pericardial effusion [5].

This case report and review has demonstrated the extreme rarity of clinically significant exudative pericardial effusion complicating ruptured appendicitis. It is important for thoracic surgeons to be aware of it. Given the low incidence, it is unlikely that consensus as to the ideal management (percutaneous v pericardotomy) will be reached.

Conflict of interest

No conflict of interest to declare.

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Ethical approval

No patient involvement required.

Consent

No consent required.

Authors contribution

Dominic Ku – data collection, writing the paper.

John Cassey – data interpretation, advise.

Rosauro Mejia – data interpretation, advise.

Registration of research studies

Not a human study.

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