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CASE REPORT

Effusive-constrictive tuberculous pericarditis in the setting of penetrating abdominal trauma

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SUMMARY

Tuberculous pericarditis is rare in developed nations and is most commonly associated with effusive-constrictive pericarditis. We present the case of a 33-year-old man with a self-inflicted mid-abdominal stab wound. The patient underwent an exploratory laparotomy, revealing a grade IV pancreatic transection and injuries to the portal vein, right renal vein, inferior vena cava and the superior mesenteric vein. Repair of the vessels was performed and a pancreaticojejunostomy with a gastrojejunostomy was created for the pancreatic injury. The patient's hospital course was complicated by tuberculous effusive-constrictive pericarditis requiring emergent median sternotomy with opening of the pericardial sac and eventual expiration. The final cultures from the pericardial fluid demonstrated tuberculosis.

BACKGROUND

Extrapulmonary tuberculosis (TB) accounts for roughly 15% of TB cases among immunocompetent hosts and for 50–70% of cases that occur in the context of co-infection with HIV.¹ In developed nations, immigrants from endemic countries are more likely to present with extrapulmonary TB. In developing countries tuberculous pericarditis is the most common cause of effusive-constrictive pericarditis (ECP). It is important to remember this type of TB for quicker diagnosis and targeted treatment in a future possible case.

CASE PRESENTATION

A 33-year-old man with no significant medical history presented as a level 1 trauma notification after a self-inflicted single stab wound to his epigastric area (figure 1). Following stabilisation in the trauma bay, the patient was taken to the operating room for an exploratory laparotomy. On entering the abdomen, it was noted that the knife was tracking anterior to posterior just above the lesser curvature of the stomach. The stomach was divided proximal to the pylorus in an effort to expose the pancreas and remove the knife. It was noted the knife created a grade IV pancreatic injury through the pancreatic body.

INVESTIGATIONS

Due to the initial stab wound to the abdomen, the patient was taken directly to the operating room. No other imaging or laboratory values were obtained on initial presentation.

DIFFERENTIAL DIAGNOSIS

Anastomotic leak; pericardial effusion due to an infectious process.

TREATMENT

Following removal of the knife, multiple venous injuries to the portal vein, right renal vein, inferior vena cava and the superior mesenteric vein were discovered. Haemostasis was achieved and all venous injuries were primarily repaired. The transected pancreas was repaired with a pancreaticojejunostomy and a gastrojejunostomy. Figures 2 and 3 demonstrate the vascular repairs, pancreaticojejunostomy and the gastrojejunostomy.

Postoperatively, the patient was admitted to the surgical intensive care unit (ICU) and remained intubated due to respiratory failure. On postoperative day 7, the patient developed diffuse ST elevations on ECG, indicative of pericarditis. A CT of the chest demonstrated a moderate pericardial effusion. A pericardial window was performed with the removal of 400 cc of serous fluid and placement of a drain. Cultures of the pericardial fluid failed to demonstrate any significant growth.

The patient remained on ventilator support and the pericardial drain was removed when output

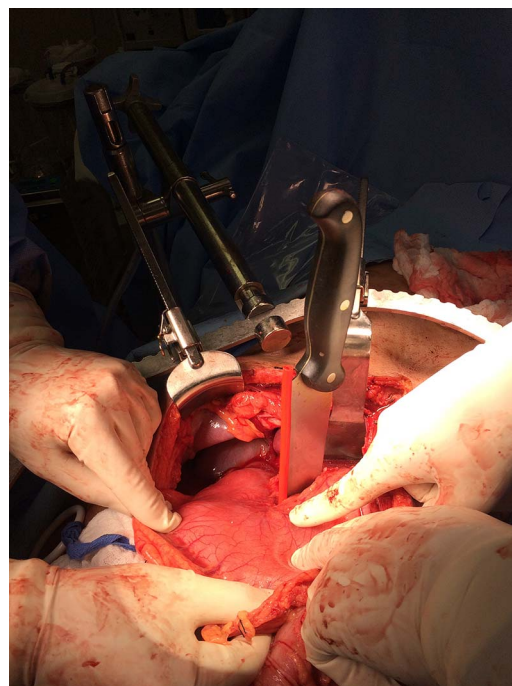


Figure 1 Knife located above the lesser curvature of the stomach.



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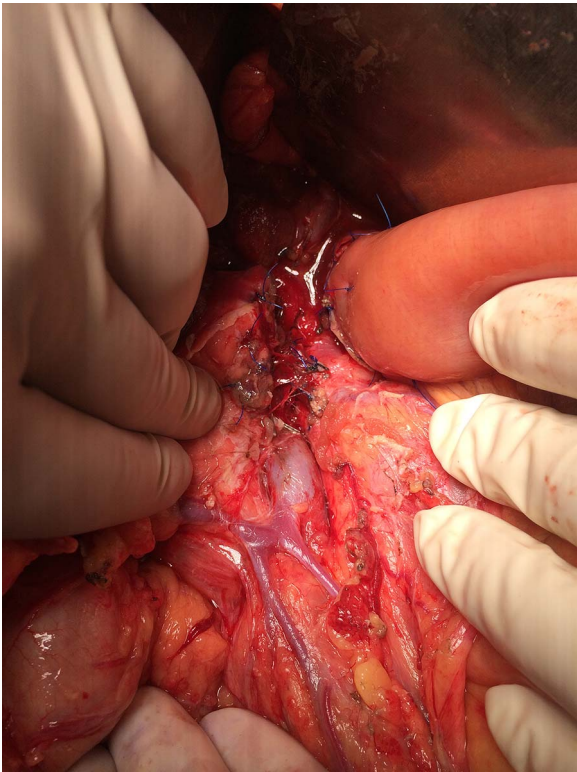


Figure 2 Intraoperative view of the vascular repairs and pancreaticojejunostomy. Venous injuries to the portal vein, right renal vein, inferior vena cava and the superior mesenteric vein were discovered.

was minimal. Continued fever spikes were noted. On postoperative day 17, the patient became haemodynamically unstable and was taken back to the operating room. Asystole was noted and advanced cardiac life support (ACLS) protocols were initiated with the successful retrieval of a pulse. Purulent fluid was noted from the previous pericardial drain site. Further investigation revealed minimal space between the heart and the pericardial sac due to thickening of both.

The patient again suffered asystole and a pulse was regained. At this juncture, a median sternotomy was created for exploration and decompression. Over 200 cc of frank pus was evacuated as the pericardial sac was opened. The heart was noted to

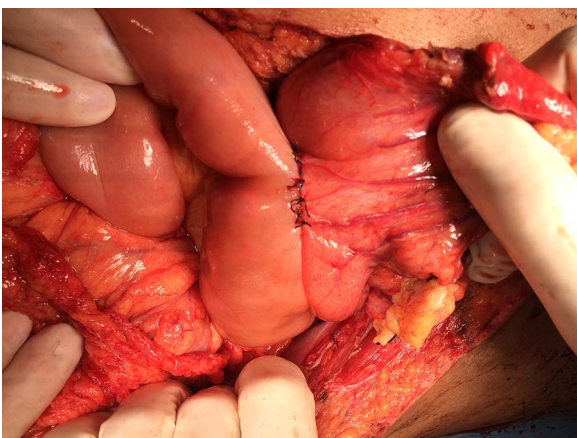


Figure 3 Intraoperative view of the gastrojejunostomy following gastrectomy to remove the knife.

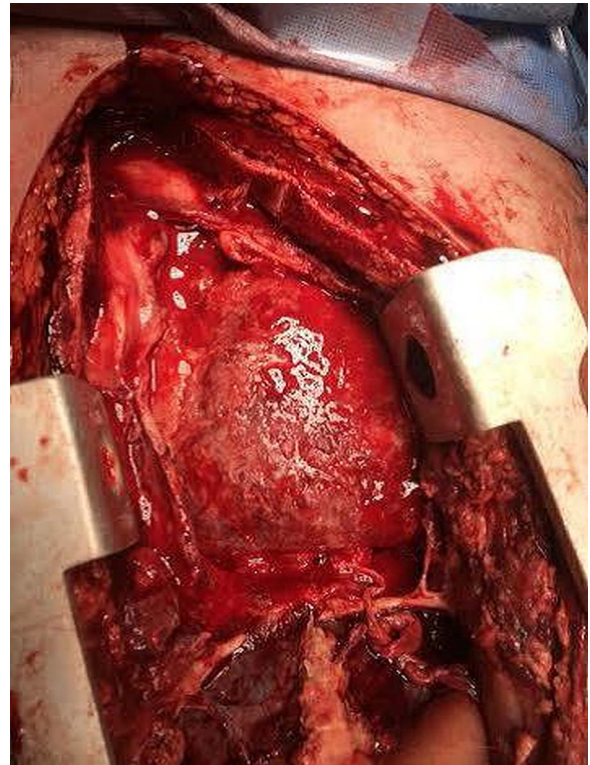


Figure 4 The heart following the emergent sternotomy. Note the significant fibrinous changes on the surface of the heart.

be thickened and covered in fibrous material. An Abthera VAC was placed on the chest and the patient was transferred to the surgical ICU.

OUTCOME AND FOLLOW-UP

The patient expired on postoperative day 17 following a period of haemodynamic instability. The final cultures from the pericardial fluid revealed TB.

DISCUSSION

ECP is a clinical syndrome consisting of both, a compressive pericardial tamponade as well as a constricting visceral pericardium, simultaneously. The occurrence of ECP is rare, with an incidence rate of 1.2% of all patients with effusive pericarditis.² The gold standard to diagnose ECP is the measurement of intrapericardial and intracardiac pressures before and after pericardiocentesis.³ ECP is believed to be a manifestation of pericardial TB⁴ as it progresses to a fibrous constrictive pericarditis.^{4 5} Previous literature has described the incidence of ECP in the setting of tuberculous pericarditis to range from 3% to 14%.⁶ Our patient presented with a significant abdominal trauma concomitant with an underlying tuberculous pericarditis. The initial pericardial effusion first noted by diffuse ST elevations on the ECG was likely the first clinical presentation of the tuberculous pericarditis.

The presentation of ECP in the setting of trauma is exceedingly rare and can compromise a patient's outcome if not recognised promptly. Combining concurrent traumatic injuries with underlying pericardial TB leading to ECP complicates the timely diagnosis of ECP. ECP presents in the setting of haemodynamic instability due to the impairment of diastolic filling and a decreased cardiac output. Drainage of pericardial fluid alone without a visceral pericardiectomy is ineffective in relieving

Learning points

- ▶ The occurrence of effusive-constrictive pericarditis (ECP) is rare, with an incidence rate of 1.2% of all patients with effusive pericarditis.
- ▶ Previous literature has described the incidence of ECP in the setting of tuberculous pericarditis to range from 3% to 14%.
- ▶ The gold standard to diagnose ECP is the measurement of intrapericardial and intracardiac pressures before and after pericardiocentesis.
- ▶ Drainage of pericardial fluid alone without a visceral pericardiectomy is ineffective in relieving pericardial constriction and tamponade.

pericardial constriction and tamponade,³ as haemodynamic impairment will persist. Visceral pericardiectomy may be the only necessary procedure to obtain a good clinical result in order to completely relieve the cardiac tamponade.⁷

Our clinical experience mirrors that of ECP. The diffusely elevated ST elevations were indicative for the presence of pericarditis leading to the development of a pericardial effusion requiring a pericardial window. The patient's haemodynamics stabilised for a short period of time following the removal of the effusive component. However, the underlying TB infection also caused a thickening of the visceral pericardium leading to both an effusive and a constrictive component. As the constrictive component worsened, a loss of cardiac elasticity and impaired diastole occurred, causing the patient to become hypotensive, requiring pressor support, and eventually requiring an emergent sternotomy. The constrictive component was evident due to the significant thickened visceral pericardium and pericardial sac, which was noted grossly. [Figure 4](#) grossly demonstrates the acute inflammatory process leading to fibrinous changes of both the pericardial sac and visceral pericardium.

The thickening of the fibrous and parietal layers of the pericardial sac, as well as the visceral pericardium demonstrates the chronicity of the underlying TB infection the patient had on presentation to the trauma bay.

A CT of the abdomen and pelvis prior to the patient suffering cardiac arrest demonstrated no significant intra-abdominal pathology related to the patient's injuries that could have manifested as hypotension and asystole. However, a significant pericardial effusion was noted. The radiographic evidence, combined with our clinical findings in the operating room and the pathological findings, certainly solidifies the conclusion that tuberculous pericarditis did present as ECP in the setting of significant abdominal trauma.

Contributors VM and SD were responsible for writing the article and overall responsibility. VM, SD, DE and AK were involved in critical revision of the article and final approval of the article.

Competing interests None declared.

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