A 44-year-old homeless male presented to the emergency department with a 6-hour history of pleuritic chest pain, shortness of breath, and generalized weakness. He had an episode of acute cholecystitis 2 years prior, for which he received a cholecystostomy tube and intravenous antibiotics at another hospital. He had been scheduled in clinic for tube removal and elective cholecystectomy, but he had not shown up for his appointment. The tube had remained in place, and he continued to manually drain the cholecystostomy bag once a day for the past 2 years. On review of systems, we noted low-grade fever with night sweats, progressive abdominal distention, and intermittent abdominal discomfort.

In the emergency department, he was tachycardic and hypotensive. Marked jugular venous distension, faint heart sounds, clear lungs, and a distended diffusely tender abdomen with a protruding cholecystostomy tube were noted on examination. The ECG showed sinus tachycardia and diffuse ST segment elevation and PR segment depression consistent with acute pericarditis (Figure, A). A water-bottle cardiopericardial silhouette and diffuse pulmonary oligemia was noted on chest radiography (Figure, B). Intravenous fluid boluses and vasopressor infusions were started. Emergent bedside echocardiography showed a large circumferential pericardial effusion with numerous refractile densities in the fluid. Right ventricular diastolic collapse was noted (Figure, C and Movies I and II in the online-only Data Supplement). There was marked respiratory variation of mitral inflow velocities along with a dilated inferior vena cava, establishing the diagnosis of pericardial tamponade (Figure, D). On the subcostal views, we noted abnormal fluid collections in the liver that appeared to communicate with the pericardial space (Figure, E and Movies III and IV in the online-only Data Supplement). Contrast-enhanced computed tomography of the abdomen showed multiple large ring-enhancing cystic lesions nearly replacing the left hepatic lobe (Figure, F). One large abscess had eroded across the diaphragm into the pericardial space (Figure, G), producing a large emphysematous pericardial effusion with air and fluid components (Figure, H).

A diagnosis of purulent pericarditis and pericardial tamponade secondary to transdiaphragmatic rupture of hepatic abscesses was made—the etiology of abscess formation was thought to be ascending infection via the cholecystostomy tube. Emergent needle pericardiocentesis yielded 1200 cc of purulent yellow fluid, which cultured positive for Klebsiella pneumoniae and Candida glabrata. Broad-spectrum antibiotic therapy with vancomycin, meropenem, and micafungin was started. Surgical pericardial drainage, hepatic abscess resection, and cholecystostomy tube removal followed. After a short period of clinical stability, the patient’s clinical condition worsened, and he eventually died of overwhelming sepsis.

Transdiaphragmatic extension of hepatic abscesses is one of the rarest causes of purulent pericarditis. The acute introduction of a large volume of infected fluid into the pericardial space results in the combination of fulminant sepsis and pericardial tamponade. Catastrophic outcomes are the norm, with mortality reaching 100% in untreated cases. Even with broad-spectrum antibiotic therapy and emergent pericardial drainage, the mortality rate remains as high as 30% to 40%. In patients who survive the acute episode, complications such as persistent pericarditis and constrictive pericarditis occur with relatively high frequency (3.5%). A high index of suspicion for this phenomenon must be maintained when a purulent pericardial effusion occurs in patients who are prone to hepatic abscesses, such as those with hepatic surgery, hepatic metastases, ascending cholangitis, or, as in this case, an iatrogenic route for bacterial entry into the hepatic parenchyma. Diagnostic clues can include the presence of an emphysematous component to the pericardial effusion on tomographic imaging and hepatic parenchymal fluid collections on subcostal views during echocardiography.

Disclosures

None.

References


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The online-only Data Supplement is available with this article at http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.114.012078/-/DC1.
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(Circulation. 2015;131:e1–e2. DOI: 10.1161/CIRCULATIONAHA.114.012078.)
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Circulation is available at http://circ.ahajournals.org DOI: 10.1161/CIRCULATIONAHA.114.012078
Figure. A, Twelve-lead surface ECG showing sinus tachycardia and diffuse ST segment elevation and PR segment depression. B, Chest radiograph in the anteroposterior projection showing a water bottle–shaped cardiopericardial silhouette and diffuse pulmonary oligemia. C, Transthoracic echocardiogram (TTE) in the parasternal long-axis view showing a large circumferential pericardial effusion with right ventricular diastolic collapse (arrow). Refractile densities are seen in the pericardial fluid. D, TTE in the apical 4-chamber view with pulse-wave Doppler interrogation of the mitral valve inflow showing marked (>25%) respiratory variation in velocities. E, TTE in the subcostal 4-chamber view showing abscesses in the hepatic parenchyma (arrow) communicating with the pericardial space (arrowhead). Right atrial collapse is noted. F, Computed tomography (CT) transverse plane images showing multiple contrast-enhancing hepatic abscesses. The cholecystostomy tube is partially seen in the duodenum (arrow). G, CT coronal plane images showing transdiaphragmatic rupture of a large hepatic abscess into the pericardial space. H, CT transverse plane images showing the resulting large pyopneumopericardium with air (arrow) and fluid (arrowhead) components.
Transdiaphragmatic Rupture of Hepatic Abscess Producing Purulent Pericarditis and Pericardial Tamponade
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Circulation. 2015;131:e1-e2
doi: 10.1161/CIRCULATIONAHA.114.012078

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