Acute Chylopericardium With Tamponade and Cardiac Arrest With Pseudomyxoma Peritonei

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A 51-year-old woman with pseudomyxoma peritonei developed cardiac arrest 5 days after surgery. Acute echocardiography demonstrated pericardial tamponade. Emergency pericardiocentesis evacuated milky fluid and circulation was re-established. Analysis of the pericardial fluid suggested chylopericardium. In conclusion, this case demonstrates that chylopericardium may be life-threatening and underlines the importance of acute echocardiography in critical management of patients with unexplained shock. **(Am J Cardiol 2021;146:134−136)**

Chylopericardium is rare but potential life-threatening and often caused by slowly progressing accumulation of fluid in the pericardium. We describe a case of acute chylopericardium leading to cardiac arrest.

Case Presentation

A 51-year-old woman with pseudomyxoma peritonei−−a rare but serious condition with cancerous cells that produces abundant intraabdominal mucin or gelatinous ascites,[1] gained weight and developed stasis dermatitis on both legs following a symptomless period. A computer tomography (CT) scan revealed extensive intraperitoneal tumor mass with compression of the inferior vena cava and enlarged lymph nodes in the mediastinum (Figure 1). In addition, asymptomatic peripheral pulmonary embolisms were found. Echocardiography 10 days before surgery showed normal cardiac chamber dimensions and function and no pericardial effusion. Medical treatment with low molecular heparin was initiated for cancer associated venous thromboembolism.

The patient was scheduled for major intra-abdominal surgery at tertiary hospital, with de-bulking and subtotal colectomy and ileostomy. Preoperatively a central venous catheter (CVC) was placed in the right internal jugular vein using an ultrasound guidance. The patient had an uneventful surgical procedure. No intrathoracic surgery was performed, and no other invasive procedures were performed in relation to the thoracic cavity. Parenteral feeding was started through the CVC immediately following surgery.

One day postoperatively, the patient developed hypotension and dyspnea with carbon dioxide retention and was admitted to the intensive care unit (ICU) for hemodynamic support with norepinephrine and non-invasive ventilation. Despite initial improvement in clinical condition, on day 5 she developed slight chest discomfort followed by progressive hemodynamic impairment with increasing vasopressor demand and increase of lactate to 7.1 mmol/l on arterial blood gas analysis. ECG showed sinus rhythm with no signs of acute myocardial ischemia (Figure 2). Cardiac troponins were within normal range. Acute bedside echocardiography was performed and demonstrated a large (>20 mm) circumferentially pericardial effusion with partial compression of cardiac chambers and compromised diastolic filling. Acute pericardiocentesis was prepared for cardiac tamponade with cardiogenic shock, but the patient's clinical condition progressed into cardiac arrest. Cardiac resuscitation was initiated and emergency pericardiocentesis was performed using Seldinger technique with an ultrasound-guided parasternal approach. 300 ml milky white liquid was drained from the pericardial space and return of spontaneous circulation was achieved (Figure 3).

Postresuscitation, a transesophageal echocardiography was performed and correct placement of the CVC catheter tip in the right atrium was demonstrated both by 2-dimensional imaging and using agitated saline administered though the 3 CVC limbs. Thoracic noncontrast CT confirmed that the CVC did not communicate with the pericardial sac and no signs of central vein thrombosis, chylothorax or lymphopericardial fistula were noticed.

A total of 400 ml pericardial effusion with milky-white color was drained within the first 24 hours (Figure 3). Drainage spontaneously resolved the following days and reintroduction of enteral feeding did not result in recurrence. The pericardial catheter was removed after 7 days and repeat transthoracic echocardiography showed no recurrence of the effusion.

Biochemical analysis of the pericardial drainage showed triglyceride of 28.2 mmol/l (2,495 mg/dl) with potassium of 7 mmol/l and sodium of 106 mmol/l, consistent with chyle. Microbiologic examination was without bacteria and cytology was without signs of malignancy.

Pathological diagnosis of removed material during intraabdominal de-bulking was mucinous adenocarcinoma of the colon. Her condition rapidly declined, and she died during this hospitalization. Relatives requested that no autopsy was performed.

Discussion

Isolated chylopericardium is an uncommon but serious cause of pericardial effusion that may cause life-threatening

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Statement of Consent: Informed consent was obtained from the patient for publication of this Case report and any accompanying images.

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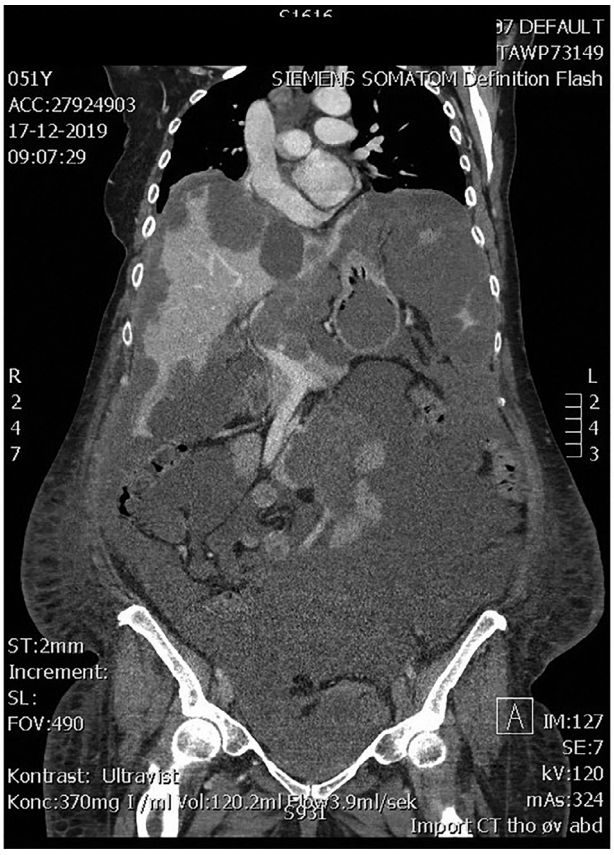

Figure 1. Preoperative CT scan of the thorax and abdomen. CT showed massive diffuse intraperitoneal tumor masses involving most abdominal organs with compression of the inferior vena cava and secondary ascites. No pathology was present in the pericardium or pleura cavity.

cardiac complications, including cardiac tamponade and cardiac arrest.

The thoracic duct conducts chyle from abdominal cisterna chyli to the systemic venous system, where it empties at the junction between the left subclavian and internal jugular vein. It enters the mediastinum through the aortic hiatus and often runs in close relationship with the pericardium, although wide anatomical variations exist.[2] Chylopericardium may be primary or secondary.[3] Abnormal thoracic lymphatics have been reported in over half of the reported cases of primary chylopericardium,[4] with communication between the thoracic duct and the pericardial space.[2,5] Secondary forms are usually related to trauma, malignancy, or direct injury to the thoracic duct following cardiothoracic surgery.[6] In the current case, the aetiology of chylopericardium was not established. Chylopericardium has previously been associated to placement or migration of a CVC. [7] Therefore, CVC displacement was considered but dismissed by contrast transesophageal echocardiography in combination with CT. Direct manifestation of pseudomyxoma was also considered as intrathoracic manifestations of pseudomyxoma peritonei has been reported and pericardial involvement has been described in a previous case report.[8,9] However, no signs of thoracic extensions of pseudomyxoma were present in this case. Pericardial fluid containing high concentrations of fatty acids and the absence of malignant cells did not suggest that the fluid was due to pseudomyxoma. No cardiothoracic invasive procedures were performed during the ICU stay——apart from placement of the pericardial drain. Chylopericardium may be a complication to the primary surgical procedure with debulking. However, surgical records reported no lesions

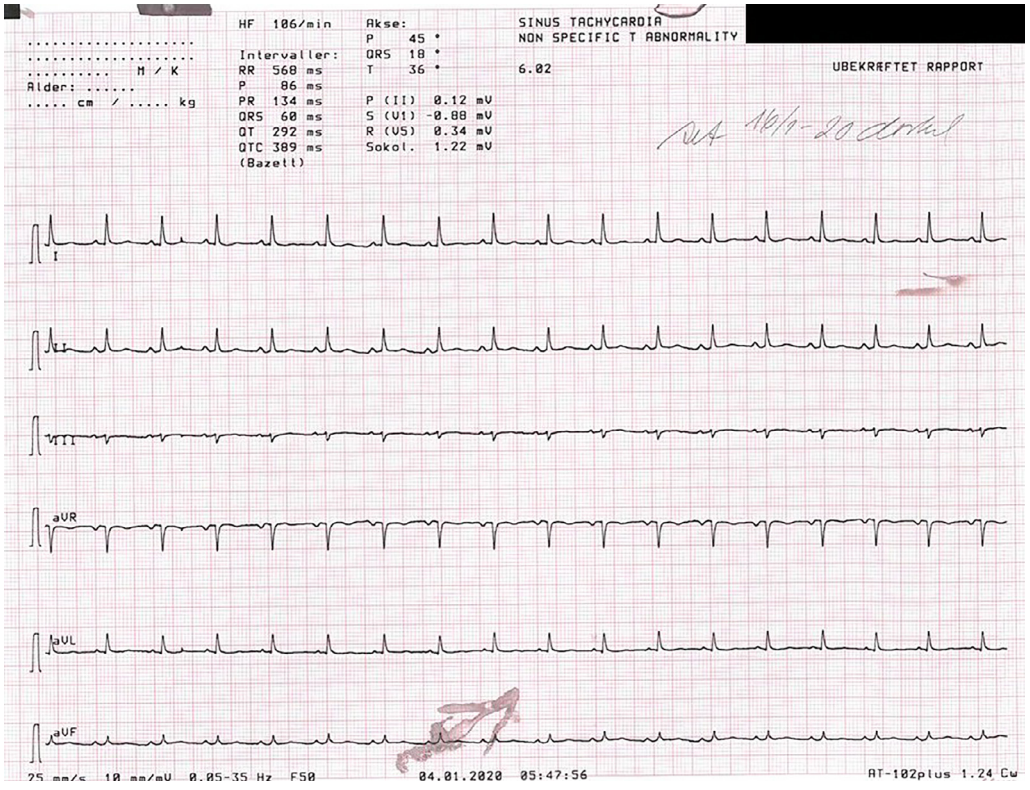

Figure 2. Postoperative ECG.

Figure 3. Milky white drained fluid (arrow) compared to parenteral feeding solution.

of the diaphragm or other chest wall perforations. Lymphangiography may have elucidated the cause of chylopericardium further but was not performed in the current case due to the patients worsening condition and death during hospitalization.

Chylopericardium usually has a slow onset. Rapid progression with clinical tamponade and acute decompensated compression of cardiac chambers and cardiac arrest has, to our knowledge, not previously been reported. The current case underlines the importance of early bedside echocardiography in hemodynamic unstable patients. Early recognition of cardiac tamponade and acute pericardiocentesis is crucial to the survival of the hemodynamic compromised patient with chylopericardium.

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