

Chylous Ascites and Chylothorax Caused by Constrictive Pericarditis

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Chylous ascites and chylopleura due to constrictive pericarditis are rare and characterized by white milky ascites and pleural fluid. Diagnosis is established by the presence of chylomicrons. However, the treatment of this situation is very difficult. We report a case of chylous ascites and chylothorax, in which hydrops was attributable to constrictive pericarditis. In the present case, pericardiectomy combined with thoracic duct ligation and pleurodesis cured chylous ascites and chylothorax caused by constrictive pericarditis, which has never been previously described.

A 19-year-old male worker was admitted on August 10, 2014, with a complaint of progressive exertional dyspnea, increased leg edema, and low-grade fever for 1 month. His medical history was unremarkable. On physical examination, his blood pressure (BP) was 84/43 mmHg (1 mmHg = 0.133 kPa); sphygmus, approximately 122 times/min; respiration rate, 20 breaths/min; and temperature, 36.7°C. Chest examination revealed percussion dullness across the bilateral lower lung areas and decreased respiratory sounds. Decreased heart sounds and shifting dullness were also observed. The lower extremity showed pitting edema. The blood examination findings were as follows: white blood cells (WBCs), $6.9 \times 10^9/L$; hemoglobin, 115 g/L; platelets, $323 \times 10^9/L$; C-reactive protein, 15 mg/L; erythrocyte sedimentation rate, 16 mm/1 h; total protein (TP), 34.7 g/L; albumin, 20.3 g/L; lactate dehydrogenase (LDH), 145 U/L; cholesterol, 2.64 mmol/L; and triglycerides, 1.25 mmol/L. T-SPOT.TB test result was positive for tuberculosis. The results of the other blood tests had no obvious abnormalities.

Thoracic computed tomography (CT) revealed bilateral massive pleural effusions and thickening of the pericardium [Figure 1a]. Abdominal ultrasonography revealed a massive intraperitoneal effusion. Thoracocentesis of the pleural effusion showed a white milky liquid sample.

The biochemical composition of the pleural fluid was as follows: TP, 88 g/L; LDH, 84 U/L; cholesterol, 0.44 mmol/L; and adenosine deaminase (ADA), 8 U/L. The fluid contained $240.00 \times 10^6/L$ WBCs, with 21% neutrophils and 75% lymphocytes. Abdominocentesis also disclosed a white milky liquid sample and a TP level of 8.8 g/L, glucose level of 5.79 mmol/L, LDH of 63 U/L, and ADA of 2 U/L. The WBC count was $600.0 \times 10^6/L$, with 90% lymphocytes and 5% neutrophils. Microbiology cultures, including bacteria, fungi, and *Mycobacterium tuberculosis*, were negative. The cytological examination result was negative for malignant cells. The peritoneal fluid samples and pleural effusion chyle tests elicited positive results. Sputum smear and culture were negative. Cytology from the sputum smear was negative. Transthoracic echocardiography revealed pericardial effusion and an 8-mm thick pericardium. The ejection fraction of the left ventricle was 77%. The left ventricular function was normal. The central venous pressure (CVP) was high at approximately 33 cmH₂O (1 cmH₂O = 0.098 kPa).

The patient was diagnosed as having tuberculous constrictive pericarditis and was started on empirical antituberculosis therapy for 1 month. However, the symptoms were not improved. First, pericardiectomy was performed via median sternotomy. Histopathological findings revealed granulomatous inflammation of the pericardial and mediastinal lymph nodes. Cultures of pericardial tissue were

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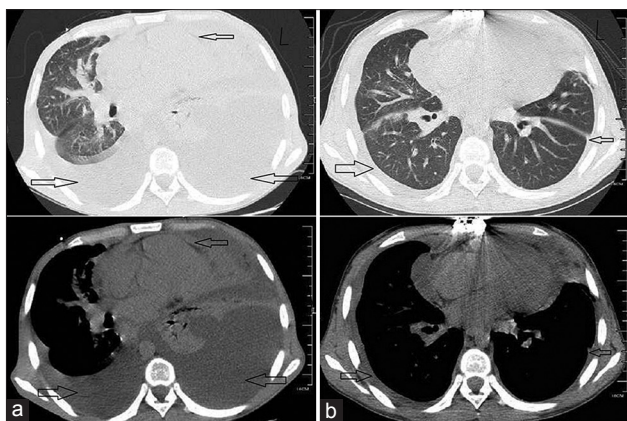


Figure 1: Comparison of thoracic computed tomography images before and after operation. (a) Preoperative thoracic computed tomography showing bilateral massive pleural effusions, thickness of the pericardium (arrows). (b) Postoperative computed tomography revealing a little thoracic cavity hydrops (arrows).

negative. The antituberculosis treatment was continued. The postoperative ascites gradually resolved, and his BP and CVP returned to their normal ranges. Octreotide (0.6 mg/d) was used, but the pleural effusion was not reduced over a 3-week period. Then, thoracic duct ligation and bilateral pleurodesis were performed. After the procedure, the clinical situation of the patient got better. Chest CT at 1 month after discharge revealed a small amount of pleural effusion [Figure 1b]. Two years of follow-up showed no recurrence of symptoms.

Chylous ascites and chylopleura caused by constrictive pericarditis are unusual clinical conditions. Previously reported cases were all cured by pericardiectomy. These conditions are usually caused by obstruction and/or disruption of the thoracic duct or one of its major divisions in the chest and abdomen.^[1,2] Diagnosis of chylous ascites and chylothorax depends on the analyses of ascites and pleural effusion. Aspiration of white milky ascites and pleural fluid might cause an empirical diagnosis. A definitive diagnosis can be made by confirming the presence of chylomicrons in the drainage fluid.^[3]

Chylous ascites and chylopleura due to constrictive pericarditis might be caused by the following mechanisms. With elevated CVP levels, effective capillary infiltration increased, and thoracic duct flow increased with increased lymphatic production caused by a capillary infiltration. However, the venolymphatic junction restricts the backflow of the incremental lymphatic flow to the systemic circulation. Moreover, lymphatic drainage might be reduced owing to the high pressure in the left subclavian vein. Lymphatic pressure will be increased, causing the rupture of dilated intestinal and intrathoracic lacteals.^[1]

This patient presented with chylous ascites and chylopleura, which were confirmed on aspiration of white milky fluid

and their analyses. We discovered constrictive pericarditis on thoracic CT, echocardiography, and hemodynamic examination. The cause of the constrictive pericarditis was considered to be tuberculosis. Pericardiectomy was performed. The etiology of the constrictive pericarditis was granulomatous inflammation. The ascites gradually resolved, but the pleural effusion was not reduced. The reason for this result might be as follows: the obstruction and disruption of the intestinal lacteals were not as severe as those of the intrathoracic lacteals, and the rupture of the dilated intestinal lacteals gradually healed with decreased CVP after pericardiectomy. Lymphangiography was performed, but failed. Most patients with nontraumatic chylothorax require surgical management.^[4,5] Thoracic duct ligation and bilateral pleurodesis were performed 3 weeks after the first operation. The postoperative pleural effusion was gradually reduced. Chylous ascites and chylothorax caused by constrictive pericarditis are rare clinical situations. To our knowledge, chylous ascites and chylothorax caused by constrictive pericarditis that are cured by pericardiectomy combined with thoracic duct ligation and bilateral pleurodesis have never been previously described.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s)/patient's guardians has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patient(s)/patient's guardians understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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