

Transudative Chylothorax Associated With Sclerosing Mesenteritis

Brenda L Rice MD MSc, James K Stoller MD MSc FAARC, and Gustavo A Heresi MD

Transudative chylothorax is an uncommon type of chylous pleural effusion, typically secondary to chyle leak and a coexisting disorder such as heart failure or liver cirrhosis. Sclerosing mesenteritis is a rare inflammatory disease of the small bowel mesentery, and has once previously been reported as a cause of chylothorax. We present the case of an 81-year-old man with a right-side transudative chylothorax associated with congestive heart failure and sclerosing mesenteritis. We discuss potential mechanisms. *Key words:* transudative chylothorax; sclerosing mesenteritis; chylous pleural effusion. [Respir Care 2010;55(4):475–477. © 2010 Daedalus Enterprises]

Introduction

Chylothorax is a pleural effusion rich in chylomicrons and triglycerides, and typically has exudative characteristics. Transudative chylothorax is an uncommon entity, which has been ascribed to various causes, including congestive heart failure, constrictive pericarditis, and cirrhosis with hepatic hydrothorax. We present a case that extends the spectrum of transudative chylothorax. We saw a patient with a neutrophilic transudative chylothorax and sclerosing mesenteritis.

Case Report

An 81-year-old non-smoking man with coronary artery disease and severe mitral and tricuspid valve insufficiency presented for preoperative evaluation for redo coronary artery bypass graft and valve repair. His medical history included hypertension and hyperlipidemia. He complained of dyspnea on exertion, fatigue, recent 4.5-kg weight loss from poor appetite, early satiety, bloating, chronic abdom-

inal pain, and intermittent diarrhea. He denied prior lung disease or recent lung infections.

On examination he appeared cachectic and had decreased breath sounds over the right lung base. A grade IV/VI pansystolic murmur was audible over the apex, without radiation. Abdominal examination was unremarkable.

Chest imaging revealed a large right-side pleural effusion, which was reportedly present for at least 4 months (Fig. 1). At that time he also had ascites and, at another hospital, underwent paracentesis, which removed “turbid whitish” ascitic fluid.

Spirometry revealed unexplained moderately severe air-flow obstruction (forced expiratory volume in the first second [FEV₁]) 1.20 L, forced vital capacity (FVC) 1.95 L, FEV₁/FVC 0.61). Echocardiogram showed a left-ventricular ejection fraction of 45%, bi-atrial enlargement, and severe mitral and tricuspid regurgitation. Pleural fluid obtained via thoracentesis revealed a transudative, neutrophil-predominant, chylous effusion (Table 1). Computed tomograms showed no lymphadenopathy. However, there was a small amount of pelvic ascites and an infiltrating calcified soft-tissue mass in the small bowel mesentery, consistent with sclerosing mesenteritis (Fig. 2).

Four years earlier, a small bowel mesenteric mass had been found during elective laparoscopic inguinal hernia repair. Biopsy of that mass showed sclerotic connective tissue with chronic lymphoplasmacytic inflammation and focal calcification. Gastroenterology consultation then confirmed the diagnosis of sclerosing mesenteritis, based on the characteristic imaging and prior biopsy results. He had coronary bypass graft, tricuspid and mitral valve replacements, and pacemaker placement, following which he had right video-assisted pleurectomy, chemical pleurodesis, and

Brenda L Rice MD MSc, James K Stoller MD MSc FAARC, and Gustavo A Heresi MD are affiliated with the Department of Pulmonary, Allergy, and Critical Care Medicine, Respiratory Institute, Cleveland Clinic, Cleveland, Ohio.

Dr Heresi has disclosed a relationship with Gilead Sciences.

Correspondence: Gustavo A Heresi MD, Department of Pulmonary, Allergy, and Critical Care Medicine, A90, Respiratory Institute, The Cleveland Clinic, 9500 Euclid Avenue, Cleveland OH 44195. E-mail: heresig@ccf.org.

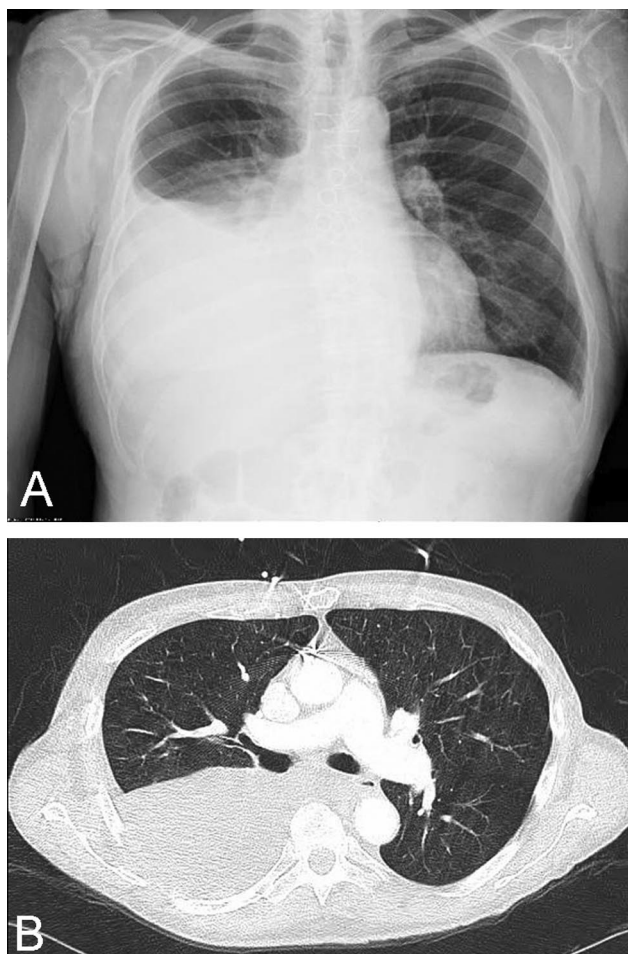


Fig. 1. A: Chest radiograph (A) and computed tomogram (B) show large right pleural effusion.

placement of a right pleural catheter (Pleurx, Cardinal Health, Denver, Colorado). He was discharged home and subsequently lost to follow-up.

Discussion

Chylothorax is a pleural-cavity accumulation of fluid rich in chylomicrons and triglycerides (> 110 mg/dL), which gives it a characteristic turbid milky appearance. Chylomicrons enter the pleural space from disruption of lymphatic drainage along the thoracic duct, which originates in the pelvis at the cisterna chyli, and ascends through the diaphragm into the mediastinum before emptying into the venous circulation at the confluence of the left internal jugular and subclavian veins.¹ Chylous effusions are typically exudative and have been classified by cause: traumatic (eg, surgery, seat-belt injury, following central-line placement) or non-traumatic (eg, lymphoma, metastatic cancer, sarcoidosis, lymphangiomyomatosis, chronic lymphocytic leukemia, venous thrombosis, superior vena

Table 1. Laboratory Findings

	Pleural Fluid	Serum
Color/clarity	Yellow/turbid	NA
pH	7.89	7.42
Red blood cells (cells/ μ L)	28	NA
White blood cells (cells/ μ L)	73	NA
Neutrophils (%)	73	NA
Monocytes (%)	14	NA
Lymphocytes (%)	8	NA
Protein (g/dL)	1.9	5.6
Lactate dehydrogenase (U/L)	53	228
Glucose (mg/dL)	117	137
Albumin (g/dL)	1.0	3.3
Chylomicron screen	Positive	NA
Triglyceride (mg/dL)	175	32
Cholesterol (mg/dL)	30	114
Routine culture	Negative	NA
Acid-fast bacilli culture	Negative	NA
Fungal culture	Negative	NA
Cytology	Negative	NA

NA = not applicable

cava syndrome).^{2,3} Chylous effusions that are associated with thoracic duct leakage alone have fluid characteristics similar to the composition of chyle (eg, low lactate dehydrogenase and high protein, with lymphocyte predominance).³

Transudative chylothorax is an uncommon type of chylous pleural effusion. A retrospective review of pleural fluid analysis from 22 chylous effusions identified 7 transudative effusions, which were all associated with both chyle leakage and a coexisting process potentially causing the effusion, such as heart failure, constrictive pericarditis, or cirrhosis with hepatic hydrothorax.³ Another review of 15 case reports of transudative chylous effusions revealed cirrhosis, nephrotic syndrome, amyloidosis, superior vena cava obstruction, and heart failure as the etiology of the effusions.⁴ Sclerosing mesenteritis as a cause of chylothorax has been reported only once previously, to our knowledge.⁵

Sclerosing mesenteritis is a rare benign disease characterized by chronic fibrosing inflammation of the small bowel mesentery. A retrospective study of 92 cases of sclerosing mesenteritis reported that the most common presenting symptoms were abdominal pain (65%), bloating (26%), diarrhea (25%), and weight loss (23%). Sixty-one percent had a calcified mesenteric mass on abdominal computed tomogram, and 14% had chylous ascites.⁶ It was postulated that intestinal lymphatic obstruction near the mesenteric mass lead to chylous ascites.

Our patient had a “turbid whitish” paracentesis fluid consistent with chylous ascites 4 months before his chylothorax was diagnosed. It is likely that transdiaphrag-

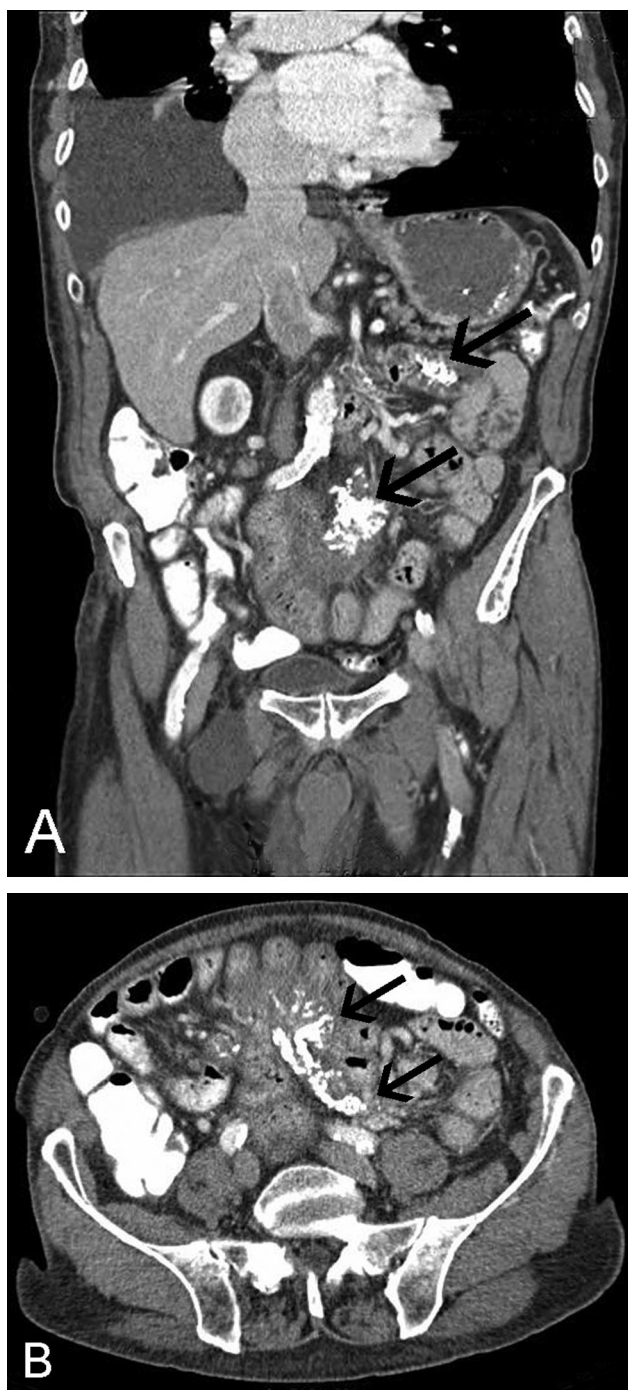


Fig. 2. Computed tomograms show calcified soft-tissue mass in the small bowel mesentery (arrows), consistent with sclerosing mesenteritis. A: Coronal view. B: Transverse view.

matic relocation of that ascitic fluid was the source of his chylothorax, as previous reports have demonstrated movement of intraperitoneal radioisotope tracer injection from

chylous ascites into the thorax via a right hemidiaphragmatic defect.⁷ The transudative nature of the effusion probably stems from the patient's underlying cardiomyopathy and heart failure.

To our knowledge, this is the first reported case of a neutrophil-predominant transudative chylothorax. Neutrophil predominance usually suggests an acute pleural process, and is seen in parapneumonic effusions, empyema, pancreatitis, and pulmonary embolism.^{8,9} Neutrophilic exudative chylothoraces have been found in the presence of empyema and bilio-pleural fistula, but never, to our knowledge, in a transudative chylothorax.³ While we are unable to explain the cause of our patient's neutrophilic chylothorax, it is noteworthy that the absolute number of leukocytes in the pleural fluid was low (73 cells/ μ L, normal 1,716 cells/ μ L).¹⁰

In summary, this report extends the literature by contributing a second case of chylothorax due to sclerosing mesenteritis. In keeping with prior studies, our patient's transudative chylothorax was associated with a second underlying condition: heart failure. Clinicians should be alerted by chronic abdominal symptoms and include sclerosing mesenteritis in the differential diagnosis of chylous pleural effusions.

REFERENCES

1. Valentine VG, Raffin TA. The management of chylothorax. *Chest* 1992;102(2):586-591.
2. Doerr CH, Allen MS, Nichols FC, Ryu JH. Etiology of chylothorax in 203 patients. *Mayo Clin Proc* 2005;80(7):867-870.
3. Agrawal V, Doelken P, Sahn SA. Pleural fluid analysis in chylous pleural effusion. *Chest* 2008;133(6):1436-1441.
4. Diaz-Guzman E, Culver DA, Stoller JK. Transudative chylothorax: report of two cases and review of the literature. *Lung* 2005;183(3):169-175.
5. Fujino S, Kohno N, Inoue Y, Fujioka S, Hamada H, Abe M, et al. [A case of chylothorax caused by mesenteric panniculitis]. *Nippon Ronen Igakkai Zasshi* 1995;32(7):516-519. *Article in Japanese.*
6. Akram S, Pardi DS, Schaffner JA, Smyrk TC. Sclerosing mesenteritis: clinical features, treatment, and outcome in ninety-two patients. *Clin Gastroenterol Hepatol* 2007;5(5):589-596.
7. Romero S, Martin C, Hernandez L, Verdu J, Trigo C, Perez-Mateo M, Alemany L. Chylothorax in cirrhosis of the liver: analysis of its frequency and clinical characteristics. *Chest* 1998;114(1):154-159.
8. Light RW. Clinical practice. Pleural effusion. *N Engl J Med* 2002;346(25):1971-1977.
9. Porcel JM, Madroñero AB, Pardina M, Vives M, Esquerda A, Light RW. Analysis of pleural effusions in acute pulmonary embolism: radiological and pleural fluid data from 230 patients. *Respirology* 2007;12(2):234-239.
10. Noppen M, De Waele M, Li R, Gucht KV, D'Haese J, Gerlo E, Vincken W. Volume and cellular content of normal pleural fluid in humans examined by pleural lavage. *Am J Respir Crit Care Med* 2000;162(3 Pt 1):1023-1026.