Bilateral Chylothorax And Chylopericardium: Minimally Invasive Surgical Management

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BACKGROUND

Chylothorax and chylopericardium are uncommon disorders in adults resulting from disruption or obstruction of the thoracic duct and mediastinal lymphatic drainage. These entities are most frequently associated with thoracic trauma, malignancy, congenital lymphatic abnormalities, or previous cardiothoracic surgery. The simultaneous presentation of bilateral chylothorax and chylopericardium in the absence of an identifiable etiology is exceptionally rare and poses a major diagnostic and therapeutic challenge due to the risk of progressive respiratory compromise, cardiac tamponade, metabolic derangements, and severe nutritional depletion.

Initial management is typically conservative and includes pleural or pericardial drainage, dietary modification, total parenteral nutrition, and pharmacologic therapy aimed at reducing chyle flow. However, persistent high-output chylous effusions are associated with significant morbidity and frequently require definitive intervention. Advanced lymphatic imaging techniques, particularly lymphangiography, may help identify underlying anatomical abnormalities or leakage sites and guide therapeutic decision-making.

Minimally invasive surgical treatment, especially thoracoscopic thoracic duct ligation, has emerged as an effective and safe strategy in refractory cases, offering definitive control of chyle leakage while reducing surgical morbidity and accelerating postoperative recovery.

METHODS

A 32-year-old female with no significant past medical history presented with progressive dyspnea on mild-to-moderate exertion associated with progressive functional limitation. Initial imaging studies demonstrated a large circumferential pericardial effusion with echocardiographic signs of cardiac tamponade, accompanied by bilateral pleural effusions. Due to hemodynamic compromise, an urgent surgical pericardial window was performed, yielding a large amount of milky fluid highly suggestive of chylous content (Fig. 2). Subsequent bilateral pleural drainage demonstrated similar fluid characteristics.

Biochemical analysis confirmed the diagnosis of chylous effusions, with triglyceride concentrations exceeding 200 mg/dL in both pericardial and pleural samples. Conservative management was initiated, including complete enteric rest, total parenteral nutrition, and continuous drainage, aiming to reduce lymphatic flow and promote spontaneous closure of the leak. Despite three weeks of optimized conservative therapy, persistent high-output drainage was observed.

An extensive diagnostic workup was subsequently undertaken to identify the underlying etiology and anatomical site of leakage. Contrast-enhanced computed tomography showed no evidence of malignancy, mediastinal masses, or traumatic injury. Additional lymphatic imaging included lymphoscintigraphy and conventional lymphangiography. While lymphoscintigraphy was inconclusive, lymphangiography ultimately demonstrated an abnormality at the level of the thoracic duct crossing, consistent with a lymphatic leakage defect (Fig. 1), which guided further therapeutic decision-making.

Referencias

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2. Dib C, Tajik AJ, Park S, Kheir ME, Khandieria BK, Mookadam F. Chylopericardium in adults: a literature review over the past decade (1996–2006). *J Thorac Cardiovasc Surg.* 2008;136(3):650-656.

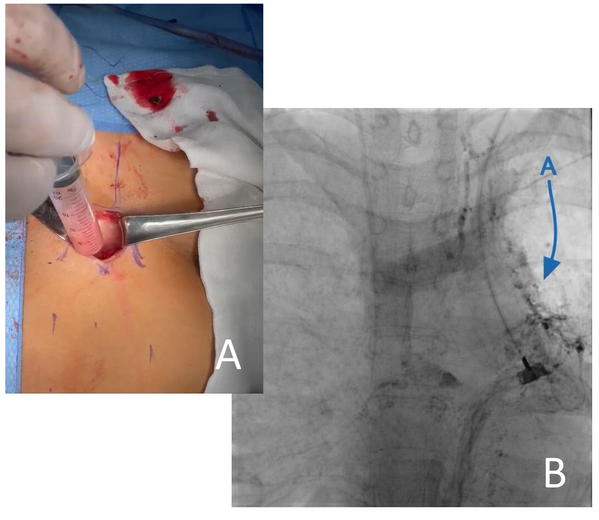

Fig 2A: Milky pericardial effusion consistent with chylopericardium.
Fig 2B: Lymphangiography demonstrating contrast extravasation

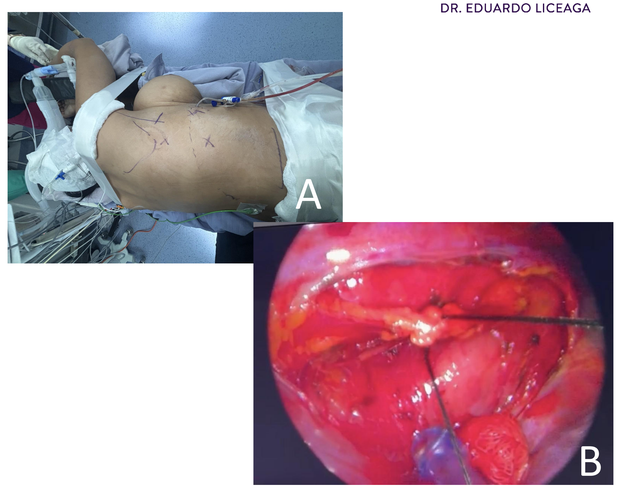

Fig 3A: Right-sided video-assisted thoracoscopic approach for surgical exploration of the thoracic duct.
Fig 3B: Thoracoscopic ligation and division of the thoracic duct performed as definitive treatment.

RESULTS

Despite initial conservative therapy, persistent chylous output with triglyceride levels around 80 mg/dL indicated treatment failure. An attempt at percutaneous embolization was unsuccessful. The patient subsequently underwent right-sided video-assisted thoracoscopic exploration (Fig 3A), followed by ligation and division of the thoracic duct (Fig 3B). The postoperative course was uneventful, with complete resolution of pleural and pericardial effusions. The patient was discharged on postoperative day three without recurrence.

CONCLUSIONS

Idiopathic bilateral chylothorax associated with chylopericardium represents an exceptionally rare and clinically challenging condition, with limited cases reported in the literature. The coexistence of pleural and pericardial chylous effusions may lead to severe respiratory compromise, cardiac tamponade, metabolic disturbances, immunologic depletion, and significant nutritional deterioration, making timely diagnosis and definitive management essential.

This case highlights the importance of a systematic diagnostic approach, including advanced lymphatic imaging, to identify underlying thoracic duct abnormalities and guide therapeutic planning. Although conservative treatment remains the initial standard strategy, persistent or high-output chylous drainage frequently necessitates definitive intervention due to the substantial morbidity associated with prolonged lymphatic loss.

Thoracoscopic thoracic duct ligation proved to be a safe, feasible, and highly effective minimally invasive treatment in this patient, resulting in rapid resolution of both pleural and pericardial effusions, accelerated postoperative recovery, and excellent clinical outcomes without recurrence. Early consideration of surgical management should be strongly advocated in refractory cases to reduce hospital stay, prevent ongoing metabolic and immunologic complications, and provide definitive control of chyle leakage.