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Chylothorax Associated with Retroperitoneal Lymphangiectasia: A Case Report

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Abstract
Chylothorax is a rare condition characterized by the accumulation of chyle within the pleural cavity, secondary to injury of the thoracic duct, with a wide range of possible etiologies. It typically presents as a milky pleural effusion, with a fluid triglyceride level exceeding 1.1 g/L (110 mg/dL) confirming the diagnosis. We report the case of a 42-year-old man, a former smoker, previously treated for pleural tuberculosis in 2001, with no history of thoracic trauma. Twenty days prior to admission, he presented with right-sided pleuritic chest pain without other respiratory or systemic symptoms; he remained afebrile, with a preserved general condition. Pleuropulmonary examination revealed clinical signs of a right-sided pleural effusion. Chest X-ray showed a moderate right pleural effusion. Thoracentesis showed milky fluid with protein levels of 20.9 g/L, LDH of 73 IU/L, and triglycerides at 28.9 g/L. The diagnosis of chylothorax was confirmed, and pleural drainage was performed. A thoraco-abdomino-pelvic CT scan demonstrated a moderate right pleural effusion without any detectable mass lesion. Magnetic resonance (MR) lymphangiography revealed retro-pancreatic and retroperitoneal lymphangiectasia, with no compressive mass identified along the thoracic duct. The patient was managed conservatively with a low-fat diet and repeated therapeutic thoracenteses, with favorable clinical improvement achieved under dietary management alone. This case illustrates that chylothorax may reveal retroperitoneal lymphangiectasia in the absence of trauma or malignancy, and underlines the value of MR lymphangiography in identifying this rare, nontraumatic etiology.

Keywords: *chylothorax; lymphangiectasia; retroperitoneal lymphangiectasia; pleural effusion; chyle; thoracic duct; mr lymphangiography; pleural tuberculosis*

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I. Introduction

Chylothorax refers to the accumulation of chyle in the pleural space, most commonly resulting from disruption of the thoracic duct or its tributaries [1,11]. Etiologies are broadly classified into traumatic (including postsurgical) and nontraumatic causes, the latter being most frequently associated with malignancy [4,7].

Chyle is formed in the intestines and consists of proteins, lipids, electrolytes, and lymphocytes [2]. The presence of chyle in the pleural cavity leads to a chylous pleural effusion, which, if persistent, can result in significant metabolic and immunological consequences [1,6]. Chronic chyle leakage may cause respiratory complications, malnutrition, immunosuppression, and even death [5,6].

The incidence of chylothorax is estimated at approximately 1 per 6,000 hospital admissions [4]. While nontraumatic causes were historically predominant, recent studies suggest that traumatic etiologies now account for a higher proportion of cases, likely reflecting the increase in thoracic surgical procedures [4,11].

II. Case Presentation

We report the case of a 42-year-old male patient, a former chronic smoker, with a history of pleural tuberculosis treated in 2001. The patient had no history of thoracic trauma.

Twenty days prior to admission, he developed right-sided basithoracic pain of pleuritic type, without associated respiratory or systemic symptoms. He remained afebrile throughout, with a preserved general condition.

Clinical examination revealed signs consistent with a right-sided pleural effusion. A chest X-ray confirmed the presence of a moderate right pleural effusion (Figure 1A). Diagnostic thoracentesis yielded milky fluid. Laboratory analysis of the pleural fluid showed protein levels of 20.9 g/L, LDH of 73 IU/L, and triglycerides of 28.9 g/L.

A thoraco-abdomino-pelvic computed tomography (CT) scan, as well as MR lymphangiography, were performed as part of the etiological investigation. Imaging findings revealed a moderate right pleural effusion

(Figure 1B) associated with retro-pancreatic and retroperitoneal lymphangiectasia (Figure 1C). No compressive mass or tumor was identified along the thoracic duct pathway.

The patient was managed conservatively with a low-fat diet combined with repeated therapeutic (evacuating) thoracenteses. The clinical course was favorable, with progressive improvement of the pleural effusion under dietary management alone; no pharmacological therapy or invasive intervention was required.

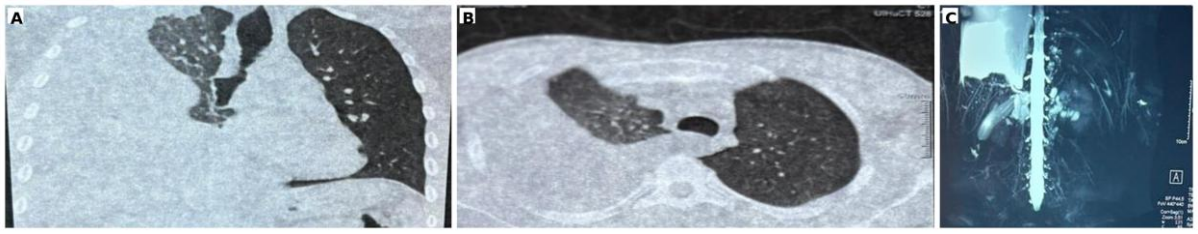

Figure 1. (A) Chest X-ray showing a moderate right-sided pleural effusion. (B) Axial thoraco-abdomino-pelvic CT scan confirming the right pleural effusion without a detectable mass lesion. (C) MR lymphangiography demonstrating retro-pancreatic and retroperitoneal lymphangiectasia, with no compressive mass along the thoracic duct.

III. Discussion

Chylothorax typically presents with nonspecific symptoms such as dyspnea, chest pain, fatigue, and occasionally fever [1,11]. The chylous fluid is classically milky, odorless, alkaline, and sterile, although its appearance may vary depending on dietary fat intake [2,3].

The diagnosis is confirmed by pleural fluid analysis: a triglyceride level exceeding 110 mg/dL (1.1 g/L), or the presence of chylomicrons on lipoprotein electrophoresis, is diagnostic [2,3]. Differentiation from pseudochylothorax is based on cholesterol levels and fluid composition [2,3].

Imaging plays a crucial role in identifying the underlying etiology. Modalities such as CT, MR lymphangiography, and lymphoscintigraphy are essential for evaluating thoracic duct abnormalities and guiding therapeutic planning [9,10].

Lymphangiectasia, observed in this patient, is characterized by abnormal dilation of lymphatic vessels due to obstruction or dysfunction, and may be congenital or acquired [14]. Although lymphangiectasia is most often described as a congenital lymphatic dysplasia, an acquired form secondary to lymphatic obstruction or fibrosis — for example following chronic infection — has also been reported. Whether this patient's prior pleural tuberculosis in 2001 could have contributed to secondary retroperitoneal lymphatic damage and lymphangiectasia remains speculative, but tuberculosis is a well-recognized, if uncommon, cause of chylothorax through direct compression or obstruction of lymphatic vessels and the thoracic duct by tuberculous lymphadenitis [12,13].

Management strategies depend on the severity and underlying cause. Initial treatment includes fluid drainage and correction of nutritional and metabolic deficits [5,6,7]. Conservative approaches involve dietary modification (a high-protein, low-fat diet enriched with medium-chain triglycerides, or total parenteral nutrition in refractory cases) to reduce chyle flow [6,8]. Pharmacological therapies such as somatostatin/octreotide or etilefrine may be used, although evidence remains limited [5,8].

In cases of persistent or high-output chylothorax, invasive interventions such as thoracic duct ligation or embolization may be required [9,10]. Conservative management is successful in approximately 50% of nonmalignant cases but is less effective in malignant etiologies [4,7].

IV. Conclusions

Chylothorax is a rare but potentially serious condition requiring prompt diagnosis and etiological investigation. This case illustrates that retroperitoneal lymphangiectasia can be an underlying, nontraumatic, nonmalignant cause of chylothorax, identified through MR lymphangiography, and that such cases can respond favorably to conservative management with a low-fat diet and therapeutic thoracentesis alone, without the need for invasive intervention. Early recognition and a thorough etiological work-up remain essential to guide management and avoid unnecessary procedures.

Additional Information

Conflicts of interest:

All authors have declared no conflicts of interest.

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