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Diagnostic Predicament of a Case of Spontaneous Transudative Chylothorax

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Abstract: ***Chylothorax is defined as presence of chyle in the pleural space. Typically, chylous effusion is exudative in nature. Transudative chylothorax is a very rare entity and is attributed to liver cirrhosis, nephrotic syndrome, SVC thrombosis, congestive heart failure and constrictive pericarditis. A 62-year-old female presented with chylothorax and a past history of mitral stenosis and left ventricular failure. On further evaluation she was found to have transudative chylothorax most likely due to congestive cardiac failure. She was treated with low fat diet, repeated thoracocentesis and diuretics. So far, only two cases of transudative chylothorax caused by congestive cardiac failure due to mitral stenosis have been reported in literature.***

Keywords: Chylothorax, transudative, mitral stenosis

1. Introduction

Chylothorax is defined as the presence of chyle in the pleural space. Diagnosis of a chylous pleural effusion is made when pleural fluid triglycerides are more than 110 mg/dl or there is presence of chylomicrons in the pleural fluid. It could be classified as traumatic which is seen in penetrating injuries to the necks or chest, trauma to the spine or vertebra, blunt chest trauma, thoracic surgery, central line placement, childbirth, or non-traumatic seen in malignancies most commonly lymphoma, metastatsis, superior vena cava syndrome, venous thrombosis, sarcoidosis. Typically, pleural fluid in a chylous effusion is exudative in nature. Transudative chylothorax is a very rare entity and is described scarcely in literature. It is attributed to liver cirrhosis, nephrotic syndrome, SVC thrombosis, congestive heart failure, constrictive pericarditis. We present one such case of transudative chylothorax.

2. Case Presentation

A 62-year-old female presented with complains of progressive exertional dyspneafor 1 year which increased over the last two months associated with swelling if bilateral lower limbs for four months. She also gave history of right sided chest pain that got aggravated on taking deep inspiration along with generalised abdominal discomfort for one month. She had a past medical history of Type 2 Diabetes and Hypertensionfor ten years and was on medication for the same. She also had a past history of being detected with a right breast lump three years agowhich was not investigated further. She was also detected as a case of left ventricular failure 4 months ago and started on medication for the same.

On examination, patient was alert. Herpulse rate was 88/min, blood pressure was 130/80mmHg and oxygen saturation was 98% on ambient air checked by pulseoxymeter. There was no pallor, icterus, cyanosis, clubbing or lymphadenopathy. Jugular venous pressure was raised. Bilateral pitting pedal edema was present until ankles. On respiratory system examinationthere was stony dull note on percussion of the right hemithorax and absent breath sounds over the same areas.

3. Investigations

Laboratory investigations revealed normal blood counts, renal function, liver function and plasma glucose. Serum RA Factor and CRP were positive and ANTI-CCP was strongly positive however ANA was Negative. Chest Radiography revealed massive right sided pleural effusion.

Thoracocentesis of the right hemithorax was done which yielded a milky white fluid. Centrifugation of pleural fluid did not show clearing of the supernatant. The fluid was subjected toanalysis which revealed lymphocytic, transudative effusion (Table 1). Pleural fluid triglycerides were 122md/dLand ratio of pleural fluid to serum cholesterol was 0.17. This confirmed the diagnosis of chylothorax and ruled out pseudochylothorax. Ratio of pleural fluid LDH to serum LDH was 0.72 which confirmed the transudative nature of the fluid. Pleural fluid gram stain, bacterial culture, Acid-fast bacilli stain, CBNAAT, amylase and malignant cells were all negative.

Table 1: Laboratory Findings of Pleural Fluid

Colour	White
Cells/mm3	9 all lymphocytes
Proteins g/dl	2.9
Cholesterol mg/dl	24
Triglycerides mg/dl	122
Lactate Dehydrogenase U/L	259
Glucose mg/dl	122
Adenosine deaminase U/L	1.5

Figure 1: Milky white pleural fluid

Figure 2: Before centrifugation

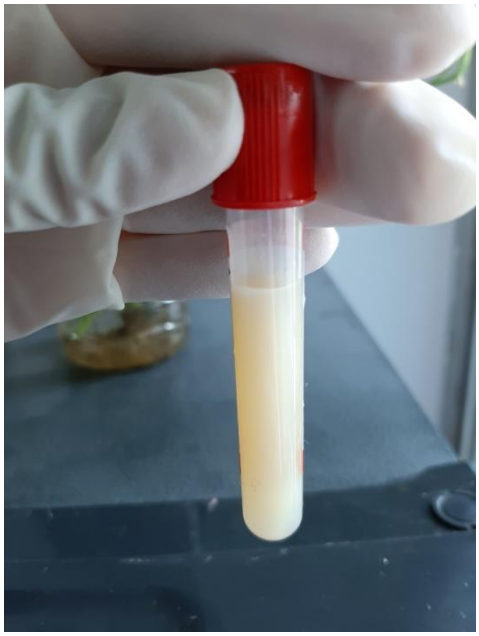

Figure 3: After centrifugation

Differential Diagnosis

- Congestive Cardiac Failure
- Malignant Pleural Effusion
- Superior Vena Cava Obstruction
- Pulmonary embolism
- Chronic Constrictive Pericarditis
- Tuberculosis
- Rheumatoid Arthritis

A CECT thorax and abdomen was done which showed an ill-defined heterogeneously enhancing lesion in the right breast. It also showed a massive right sided pleural effusion causing collapse of the right lung with relative sparing of the right upper lobe and shift of mediastinum to left. Along with this it also showed minimal left sided pleural effusion and ascitis. Visualised portions of the lung parenchyma appeared normal.2DEcho was done which revealed akinetic anterior septum, apical septum, apex and apicolateral wall. Mitral Valve Orifice Area was 1.3 cmm2 with grade-2 eccentric mitral regurgitation, moderate left ventricular systolic dysfunction with Ejection Fraction 35%, Mild Tricuspid Regurgitation and mild Pulmunory Arterial Hypertension.

Treatment

Therapeutic thoracocentesis was done to drain the fluid and every alternate day 1 litre of fluid was aspirated for two weeks. Injection furosemide was used along with her regular medication for IHD, HTN and DM. Low fat diet was prescribed. Patient improved symptomatically after 2 weeks and Chest radiography showed decrease in the right sided pleural effusion.

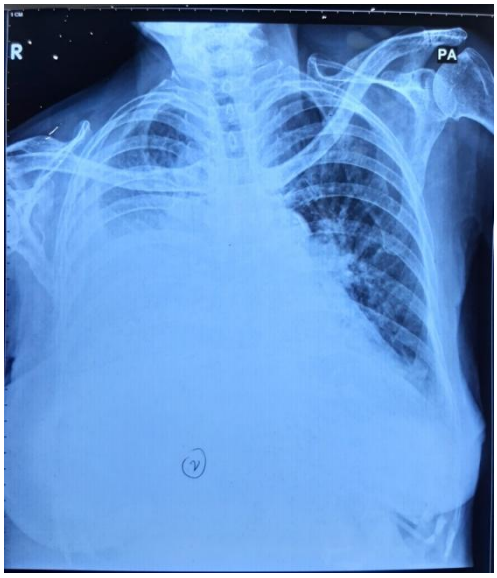

Figure 4: Chest radiography at presentation

Figure 5: Chest radiography after two weeks

Outcome and Follow Up

She was referred to department of surgery for management of the right sided breast lump. She was subsequently lost to follow up.

4. Discussion

Formation of chylothorax is the result of either disruption or obstruction in the thoracic duct, leakage of chyle from

lymphatic masses or malformations or by transdiaphragmatic migration of chylousascitis leading to accumulation of chyle in the pleural space. Typically, chylotharax is exudative in nature and is rich in triglycerides and chylomicrons which impart the turbid and milky appearance to it. However, chylothorax can also appear serous, serosanguinous or bloody. In a small minority of cases chylous effusion is transudative in nature. The diagnosis of chylothorax requires demonstration of chylomicrons in the pleural fluid. However, this requires lipoprotein electrophoresis which is cumbersome hence pleural fluid triglyceride levels of >110 mg/dL is used to diagnose it. Transudative chylothorx is scarcely described in literature. A few causes of the same include cirrhosis of liver, heart failure, nephotic syndrome, superior vena cava thrombosis and lymphoma.

In our case right sided effusion yielded a transudative chylothorax however contralateral effusion could not be tapped in view of it being minimal and similarly paracentesis could not be done. A diagnostic predicament arose as the effusion could be due to the previously proposed DDs. Final diagnosis was made after considering the following points:

1) Malignant pleural effusion due to breast malignancy: Trucut biopsy of the breast lump showed mucinous, micropapillary, signet ring cells and thus was positive for malignancy. However, facts that did not favour this diagnosis were that, malignant pleural effusions are typically haemorrhagic or serohaemorrhagic in appearance and exudative on biochemical analysis though can very rarely be transudative. Since this was a chylous effusion and transudative in nature, it went against the diagnosis. Also, pleural fluid cytology did not yield any malignant cells.
2) Pleural effusion due to connective tissue disorder: Since RA Factor and CRP were positive there was a possibility of pleural effusion being secondary to Rheumatoid Arthritis. However, in Rheumatoid Arthritis Pseudochylothorax is seen and not chylothorax which went against our diagnosis.
3) Tuberculosis: It was ruled out as pleural fluid CBNAAT was negative.
4) Pleural effusion secondary to congestive cardiac failure: Presuming that the contralateral pleural effusion and ascites would also yield chyle and considering the clinical features with which the patient presented, congestive cardiac failure seems like the best possible diagnosis.2DEcho done in the patient had revealed mitral stenosis which could be the cause of right sided heart failure and pulmonary hypertension.

The exact mechanism causing chylothorax in such a patient is not known. The postulated mechanism is that high pressure in the left subclavian vein due to mitral stenosis reduces lymphatic drainage. As a result of restricted lymphatic drainage, lymphatic venous collaterals form but cannot handle the normal lymphatic flow. The chylous fluid thus may leak into the pleural and peritoneal cavity giving rise chylous pleural effusion and ascitis. Till date chylothorax has been described as a result of mitral stenosis with pulmonary hypertension and right heart failure only in two instances by articles published by Brenner Wi et al and Molina Boix M et al.

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