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Urinothorax: an unexpected cause of pleural effusion in a patient with non-Hodgkin lymphoma

K. KARKOULIAS, F. SAMPSONAS, A. KAPARIANOS, M. TSIAMITA, G. TSOUKALAS*, K. SPIROPOULOS

University of Patras, University Hospital of Patras, Department of Internal Medicine, Division of Pneumology, Rio, Patras (Greece)
**Chest Hospital Sotiria, Athens (Greece)*

Abstract. – Urinothorax is a rather rare cause of pleural effusion and its potential mechanism is urinary tract obstruction or trauma that results in urine leakage and accumulation inside the pleural space. Patients with non-Hodgkin lymphoma could present with pleural effusion due to mediastinal lymphadenopathy or extrathoracic manifestation such as urinary tract obstruction, the latter described in our case report. Physicians must be aware even of the more occult mechanisms of pleural fluid accumulations which could point to extrathoracic manifestations of involvement.

Key Words:

Pleural effusion, Non-Hodgkin lymphoma, Urinothorax

Introduction

Urinothorax (or urothorax) is defined as the presence of urine in the pleural space. This condition is due to the leakage of urine collection from peritoneum and retroperitoneal space into the pleural space. Urinothorax has been rarely described and is commonly associated with severe clinical situations such as urinary tract obstruction or trauma, including iatrogenic injury from percutaneous or ureteroscopic manipulations and extracorporeal shock wave lithotripsy[1]. To our knowledge there is no publication describing an association of non-Hodgkin lymphoma and urinothorax. We present a case of pleural effusion (urinothorax) due to obstructive uropathy secondary to lymph node masses of the retroperitoneum, in a patient with non-Hodgkin lymphoma.

Case Report

A 47 year old man was admitted to the Emergency Department because of dyspnea and non-productive cough. He had a history of non-Hodgkin lymphoma diagnosed 4 years ago. He underwent two chemotherapy schemata in 2002 and 2003 with an additional radiotherapy in the same period and subsequently underwent autologous bone marrow tissue transplantation. Following these therapeutical interventions the patient was asymptomatic.

On presentation, during physical examination he was alert, and oriented but tachypneic with a respiratory rate of 25 per minute. Blood pressure was 130/80 mmHg, pulse 100bpm and temperature 37 °C. Oxygen saturation was 92% to the room air. Diminished breath sounds and dullness on percussion where noted mainly on the right side of the chest.

Chest X-ray showed a large right and minor left pleural effusion. A thoracentesis of the pleural effusion exhibited an LDH of 110 U/L compared to a serum LDH of 412 U/L and a pleural fluid protein level of 2.5 g/dl compared to a serum protein level of 6.2 g/dl. A ultrasound examination of the abdomen revealed a dilated right ureteropelvic junction, possibly due to compression from extraureteric tissue and bilateral pleural effusions. A chest CT scan performed confirming a large pleural effusion mainly to the right hemithorax and huge mediastinal lymph node masses compatible with the primary disease (Figure 1). Abdomen CT revealed perihepatic fluid, great masses, compatible with enlarged lymph nodes of the retroperitoneum which were compressing both the ureteres-mainly the right one (Figure 2).

Due to CT findings and lack of specific cause of transudate pleural effusion (heart failure, cirrhosis, renal failure, nephrosis etc) additional biochemical

Corresponding Author: Kostas Spiropoulos, MD; e-mail: k-spiropoulos@hotmail.com

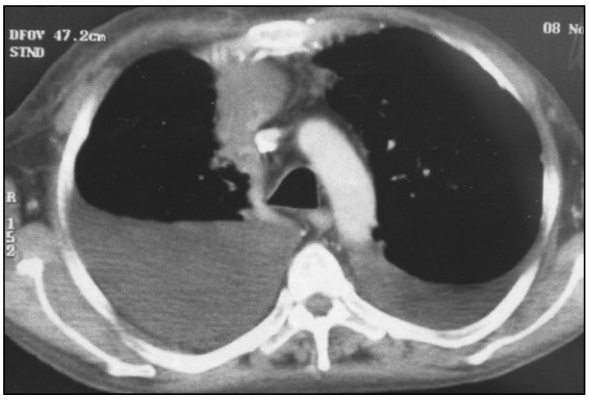

Figure 1. Chest CT scan demonstrating a large pleural effusion mainly to the right hemithorax and huge mediastinal lymph node masses compatible with the primary disease.

Figure 2. Abdomen CT revealing perihepatic fluid, great masses, compatible with enlarged lymph nodes of the retroperitoneum which were compressing both the ureteres-mainly the right one.

parameters were evaluated in the pleural fluid including creatinine and urea. pH of the pleural fluid was 7.3. Pleural fluid creatinine and urea levels were 3.7 mg/dl and 67 mg/dl respectively whereas plasma creatinine and urea levels where 2.1 mg/dl and 50 mg/dl respectively. Moreover effusion cholesterol and triglyceride levels were 65 mg/dl and 28 mg/dl respectively, amylase levels were 2 U/l and glucose levels were 111 mg/dl.

Discussion

Urinothorax is a pleural effusion due to urine accumulation in the pleural space. This rare condition is due to the leakage of urine collection from peritoneum and retroperitoneal space into the pleural cavity. The most common causes reported of urinothorax are urinary obstruction, retroperitoneal inflammatory or malignant diseases, renal biopsy, blunt trauma, percutaneous renal and endodcopic ureteral intervations, adult type polycystic kidney disease, and extracorporeal shock wave lithotripsy[1-3].

Urinothorax is mostly ipsilateral to the obstructed urinary tract, and rapid accumulation of fluid in the pleural space appears to be common[1]. As far as we know this is the first case in the literature of urinothorax due to non-Hodgkin lymphoma. Abdominal lymph node masses causing ureteral obstruction could be the etiology of urinary pleural effusion. Classically two possible routes by which urine may reach the pleural cavity have been considered: lymphatic drainage and direct leakage into the mediastinum followed by rupture into the pleural space[1]. In addition we should also consider the direct movement of the abdominal fluid into the pleural space through defects in the diaphragm[4]. The rapid accumulation of pleural fluid, which is common in urinothorax, suggests that this may also be the dominant mechanism in our patient.

To establish a diagnosis of urinothorax it is necessary to perform thoracocentesis in order to evaluate three important diagnostic criteria: (1) transudative pleural fluid, (2) pleural fluid-serum creatinine ratio greater than 1.0 and (3) low pleural fluid pH (usually less than 7.3). In our patient there was no other factor that could be responsible for a transudate pleural effusion. We believe that when thoracic collection occurs in patients with urinary tract obstruction or retroperitoneal lymph node masses, urothorax condition should be considered. Probably, this unusual condition resulted because of lack association between pleural effusion and abdominal lymph node masses. Our case may be more common than believed.

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