Case Reports/Olgu Sunumları

Urinothorax: An Unusual Pleural Effusion

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SUMMARY
Urinothorax is seen quite rarely in the etiology of pleural effusion. Pleural effusion due to urine accumulation in the thorax is known to be secondary to urinary obstruction, trauma, retroperitoneal inflammatory or malignant process, failed nephrostomy or kidney biopsy. The lack of reported cases may be owing to the lack of suspicion. This is a report of a patient with urinothorax, resulting from bilateral hydronephrosis and ureteral obstruction due to bladder carcinoma. He was hospitalised owing to high urea, creatinine, potassium serum levels and oliguria. His chest X-ray showed bilateral small pleural fluid characteristic of transudate, but a high index of suspicion because of the odor of the pleural fluid, alerted us to determine the pleural creatinine level concentration in the pleural fluid. Diagnosis of urinothorax was confirmed by high level of pleural creatinine (5.3 mg/dl). When obstructive uropathy and pleural effusion are associated together, a high index of suspicion is required to avoid for invasive diagnostic studies in a malignancy or another etiology. This may lower the number of cases that fail to identify the origin of pleural effusion and increase the number of urinothorax cases.

Key Words: Urinothorax, pleural fluid, obstructive uropathy

ÖZET
Ürinotoraks: Az Görülen Bir Plevral Effüzyon Nedeni

Anahtar Kelimeler: Ürinotoraks, pleval sıvı, obstrüktif üropati
INTRODUCTION
A rare cause of pleural effusion is the presence of urine in the pleural space associated with urinary tract obstruction. Prior reports of urinothorax have based the diagnosis on clinical, radiological, and surgical findings. Recently, pleural fluid creatinine level has been very valuable and easy in establishing the etiology of this condition.

CASE REPORT
A 61 years old male patient whose complaints were clotted hematuria, oliguria and shortness of breath for one week was referred to our hospital. He had a transurethral resection (TUR) operation for carcinoma of the bladder, 3 years ago. His complaint of nonclotted hematuria had began 4 months ago, then the diagnostic evaluation demonstrated the nux bladder carcinoma and bilateral hydronephrosis. He refused the second surgical operation and medications at that time. However his complaints increased so much as to force him to come to the hospital again. The patient whose urine was heavily clotted was oliguric. His physical examination was noteworthy for severe anemia and a palpable mass which had approximately covered all of right lower quadrant. The serum creatinine level, nitrogen in blood urea and potassium were measured to be 5.2 mg/dl, 65 mg/dl and 6.8 mmol/L respectively. The pelvic ultrasound and computerised tomography revealed the 9x3.6 cm lobulated, heterogen, solid mass of bladder carcinoma which caused bilaterally hydroureteronephrosis grade 2 and 3. No urinoma was reported. The chest x-ray indicated small bilateral pleural effusion. Diagnostic thoracentesis was carried out with the help of ultrasonography and showed pleural fluid characteristic of a transudate, but the odor of the pleural fluid resembling to urine, alerted us to determine the creatinine level in the pleural fluid. The levels of pleural creatinine and simultaneously obtained serum creatinine were 5.3 and 5.2 mg/dl respectively and these values were specific for diagnosis of urinothorax (2,4). Only with the supportive therapy, during the next 72 hours, his oliguria was resolved spontaneously and his urine volume was approximately 3500 cc/day. His second control X-ray was normal. His pleural effusion disappeared at the end of the third day and particularly his renal function improved. We referred him to the urology department for surgical operation.

DISCUSSION
The mechanism of the urine finding about its way into the pleural cavity is unknown. Two theories proposed by Friedland et al. are explained by direct leakage into the mediastinum and then rupture into the pleural space, and by a drainage via the way of lymphatics (5).

Although it is an uncommon cause of pleural effusion, it has long been associated with urinary obstruction and retroperitoneal urinary leakage (urinoma) (2). In the review by Salcedo, urinothorax is known to develop in the affected obstructed side and pleural effusion was discovered shortly after diagnosis of urinary obstruction detection of urinoma and the definitive diagnosis of urinothorax generally was not made until the effusion was resolved, following urinary diversion (2). In his review including 22 cases, diagnosis was made with suspicion only in one case with the odor of the pleural fluid (2). We want to emphasize that when predisposing conditions are described for the patient, the clinician should consider the possibility of urinothorax as an unusual etiology in the development of the pleural effusion. Urinary tract obstruction, trauma to collecting system, and urinoma are three common predisposing conditions to alert physicians to this condition (2).

In this case, our belief is that a large clot caused an acute obstruction of the urinary tract which was already obstructed bilaterally and worsened the situation and caused oliguria. This led an excess pressure and then gave a way to a transdiaphragmatic evasion to cause urinothorax reported as a mechanism before by Gurtner (1). Although we could not get any knowledge from his medical history about his pleural effusion, resolving of the pleural effusion and oliguric situation happened at the same time. These data supported our belief and it is mentioned in the literature that temporary or permanent urinary diversion may resolve the problem, as it happened in our case (2).

We were not able to determine the interval between precipitating event and urinothorax exactly but it should be after an acute obstruction due to a heavy clotted hematuric state. Thoracentesis, followed by a measurement of creatinine in the pleural fluid, is a very simple procedure to establish the true diagnosis of urinothorax (1). Stark and his associates concluded that elevated pleural fluid creatinine level was specific for diagnosis (4). In his study it was shown that when obstructive uropathy was not present, the concentration of creatinine in the pleural fluid did not significantly exceed the serum concentration. Low
pleural fluid glucose concentration may be also seen in urinothorax patients, but the patients having the largest difference in pleural serum creatinine also had the largest glucose differences (4). To diagnose a benign cause of pleural effusion in patients with urinary tract obstruction, related to a malignancy, is very important. The possibility of urinothorax should always be considered in patients with urinary obstruction and pleural effusion, before planning the further investigation for diagnosis. Medical history and sometimes odor of the pleural fluid may gain importance in the diagnosis of urinothorax.

We believe that a high index of suspicion may lower the number of such cases that fail to identify the origin of pleural effusions and the number of cases of urinothorax are much higher than the number of reported cases.

REFERENCES


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