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(CASE REPORT)

Urinothorax: A rare cause of pleural effusion

M. A. EDDAHIOUI *, O. ABOUOBAYD, M. IJIM, O. FIKRI and L. AMRO

Department of Pulmonology, AR-RAZI Hospital, MOHAMMED VI University Hospital, LRMS Laboratory, Faculty of Medicine and Pharmacy of Marrakech, Cadi Ayyad University, Marrakech, Morocco.

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Abstract

An unusual cause of pleural effusion is the presence of urine in the pleural cavity, also known as Urinothorax. We present here a case arising after placement of a double J catheter. Biochemical analysis of the pleural fluid strongly suggested this diagnosis. Treatment, including therapeutic thoracentesis and management of the underlying uropathy, resolved the problem. It is essential to bear in mind this rare diagnosis when pleural effusion occurs after urological surgery. Further studies are needed to define precise diagnostic criteria.

Keywords: Urinothorax; Creatinine ratio; Rare cause of pleural effusion; Thoracentesis

1. Introduction

Although rare, urinothorax is a significant cause of pleural effusion. It is a phenomenon in which urine accumulates in the pleural cavity, often presenting biochemical characteristics of sterile transudate. This condition is usually caused by an obstructive or traumatic lesion of the urinary tract.

We present here a case of sterile transudative pleurisy following placement of a double J catheter in the setting of obstructive acute renal failure in a patient with a voluminous tumour process invading the urethra and bladder. This case highlights the importance of close monitoring of patients who have undergone such procedures, as they may be at risk of developing this rare complication.

Crucially, accurate diagnosis and appropriate treatment are essential in the management of urinothorax, and healthcare professionals should be alert to any signs or symptoms suggestive of its presence. With proper care, patients can usually make a full recovery.

2. Case report

H.E., aged 51, is a housewife, post-menopausal, and has never been treated for tuberculosis. She has had no recent contact with the disease. Her history includes a total thyroidectomy in 2018, for which she is currently taking 100 µg levothyrox daily. Since 2023, she has been followed in oncology for locally infiltrating squamous cell carcinoma of the cervix, invading the vagina, bladder and urethra. She underwent a colostomy and received radiochemotherapy. Recently, she presented with acute obstructive renal failure, for which she received a double J catheter 10 days ago, with the right catheter falling out 7 days ago.

For the past 7 days, she has presented with abdominal distension, painful right lumbar swelling and oliguria. Two days ago, she developed SADOUL stage III acute dyspnea, accompanied by right laterothoracic pain (VAS 5/10) and a productive cough with whitish sputum. She remains apyretic, but her general condition is altered.

* Corresponding author: M. A. EDDAHIOUI

On clinical examination, her body temperature was 36°C and her blood pressure was normal, measured at 123/78 mmHg, but she had an elevated heart rate (110 bpm), a respiratory rate of 24 breaths per minute and an oxygen saturation of 93% on room air. Physical examination revealed dullness on percussion and decreased breath sounds in the right hemithorax, suggesting a large right pleural fluid effusion. Abdominal examination revealed diffuse dullness suggestive of voluminous ascites, as well as a round, fixed, inflammatory and painful swelling in the right lumbar region, with a positive Giordano sign. The left catheter functions normally, while the right catheter is obstructed and drains only 100 cc in 24 hours. The rest of the somatic examination was unremarkable.

A chest X-ray (Figure 1) confirmed the presence of a large right-sided pleural effusion. A thoracentesis was performed (Figure 2), revealing a clear pleural fluid with a urine-like odour. Biological analysis showed pleural protein at 4.9 g/l, LDH at 3 IU/l, pleural creatinine at 48 mg/l and serum creatinine at 42 mg/l, with a creatinine ratio of almost 1.14. Cytology revealed 2000 predominantly lymphocytic leukocytes, and no bacteria were detected.

Figure 1 Front thoracic X-ray showing large right pleurisy

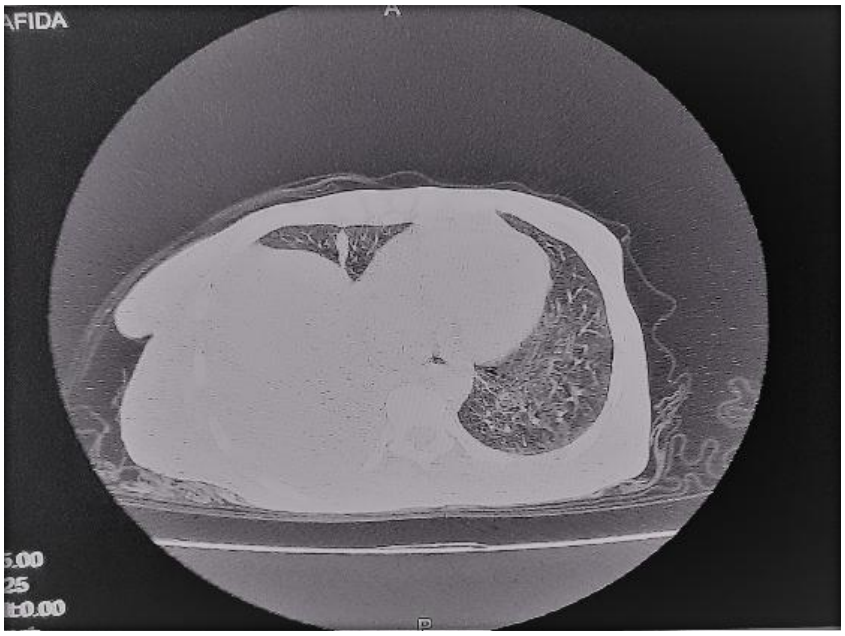
The diagnosis of urinothorax was made due to the presence of a urine-like odor in the pleural fluid, an elevated creatinine ratio (greater than 1) in this fluid, and its sterile, transudative characteristics. Therapeutic thoracentesis was performed in this patient, leading to a significant improvement in her symptoms, including a reduction in dyspnea and chest pain. This improvement was confirmed by a follow-up chest X-ray, showing regression of the initial abnormalities.

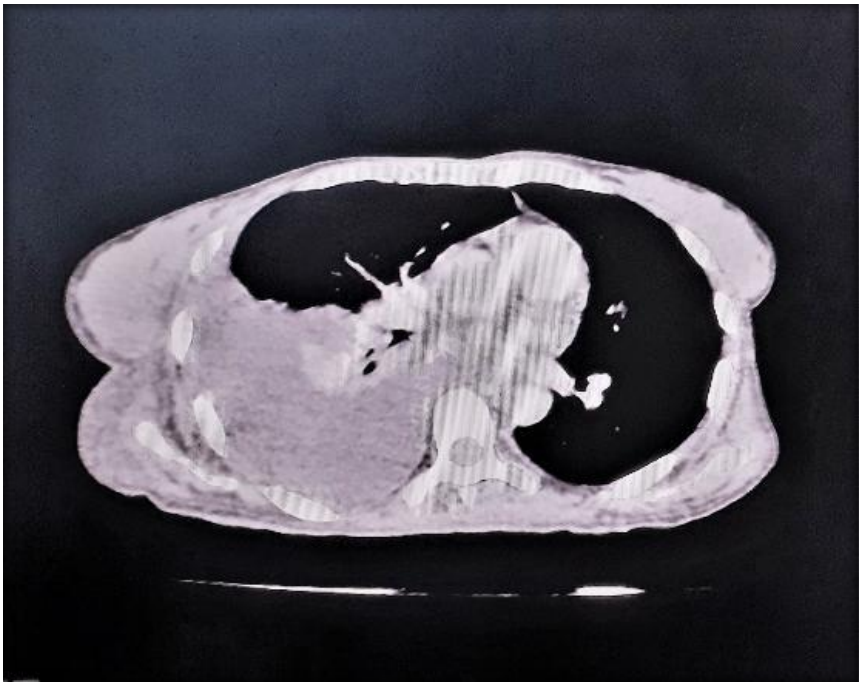
A thoraco-abdomino-pelvic CT scan (Figure 3, 4, 5, 6) was performed in this patient, demonstrating a moderate right-sided pleural effusion and a right perirenal collection suggestive of a urinoma. The distal tip of the right catheter was visible in an extrarenal and right subdiaphragmatic position, with identification of a largely necrotic centropelvic mass showing locoregional infiltration responsible for bilateral ureterohydronephrosis.

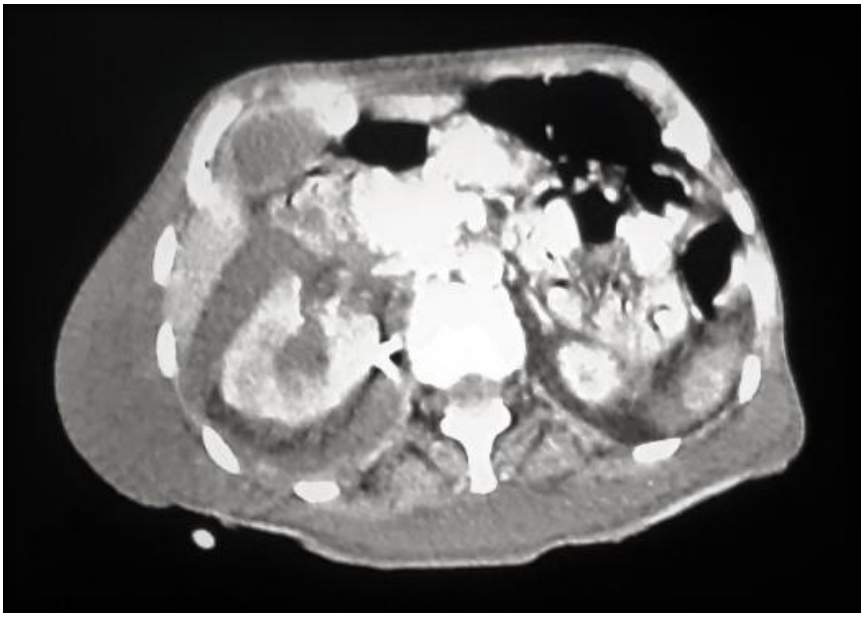
The patient was admitted to the urology department and began antibiotic therapy with C3G 2 grams daily for 10 days. Due to her acute renal failure, she underwent two sessions of hemodialysis, with repositioning of the right catheter. Clinically, she showed improvement (decreased dyspnoea, SaO2 96% on room air).

A follow-up chest X-ray on day 2 (Figure 7) showed resorption of pleural fluid, indicating a favorable evolution. She was subsequently transferred to the oncology department for further treatment.

Figure 2 A simple exploratory pleural puncture was performed







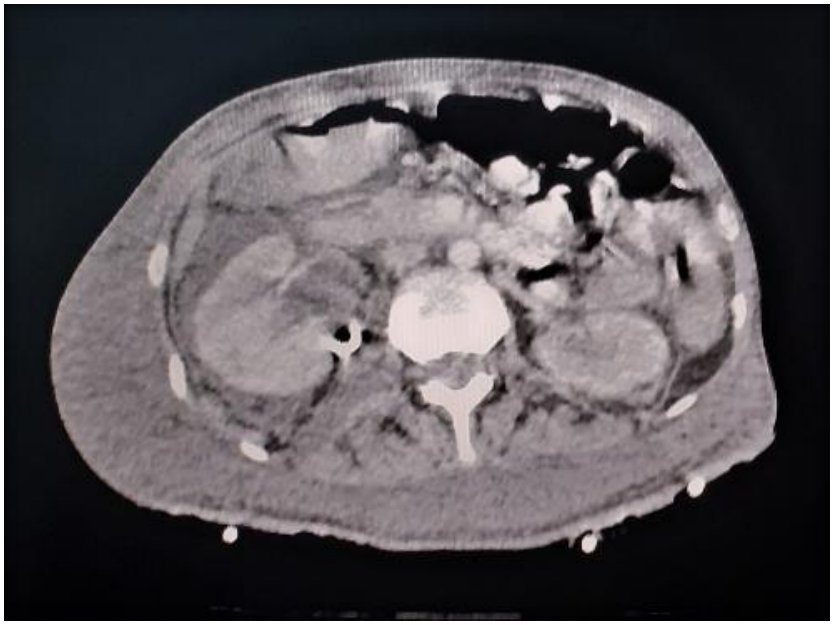


Figure 3, 4, 5, 6: A thoraco-abdomino-pelvic CT scan was performed in this patient, demonstrating a moderate right-sided pleural effusion and a right perirenal collection suggestive of a urinoma. The distal tip of the right catheter was visible in an extrarenal and right subdiaphragmatic position, with identification of a largely necrotic centropelvic mass showing locoregional infiltration responsible for bilateral ureterohydronephrosis.

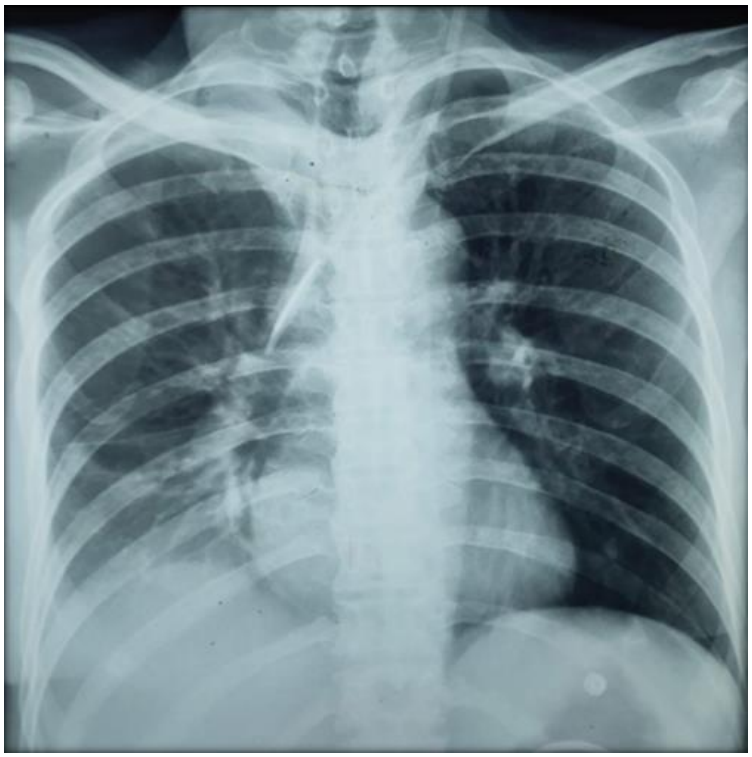


Figure 7 Control chest X-ray showing resorption of right pleural fluid

3. Discussion

According to a study by SOUMARE [6], the etiology of pleurisy was tuberculous in 52.17%, and neoplastic in 10.86%. No etiology was found in 36.95%. Among neoplastic etiologies, pleural metastases were of gynaecological-mammary origin in women, and bronchopulmonary, digestive and prostatic origin in men.

Although rare, urinothorax is also an etiology of pleural effusion that is probably underestimated in clinical practice. Symptoms frequently observed include dyspnoea, manifested by difficulty in breathing; chest pain, often experienced as discomfort or sharp pain in the chest; abdominal pain; and decreased urine output, indicating possible involvement of the urinary tract. [2].

On a chest X-ray, a unilateral pleural effusion is typically seen, corresponding to the side of the uropathy. The diagnosis of urinothorax is confirmed by thoracentesis. This procedure initially reveals pleural fluid with a urine-like odour, as in our case. Detailed analysis of the pleural fluid revealed a transudative fluid with a pH below 7.30. A pleural creatinine to serum creatinine ratio greater than 1 is considered a positive diagnostic criterion for this condition, indicating the presence of urine in the pleural fluid. [3,4].

To treat urinothorax, it is crucial to drain the pleural effusion and address the underlying cause. Patients who receive both thoracic drainage and etiological treatment appear to have better outcomes than those who receive thoracic drainage alone. [5].

In our patient's case, the pleural fluid was drained and the underlying urinary obstruction treated. This comprehensive approach led to complete resolution of the condition, relieving symptoms and improving the patient's overall health.

4. Conclusion

Urinothorax, although uncommon, is often under-diagnosed. It is crucial to consider the possibility of urinothorax in the context of recent urological pathology or surgery. The ratio of pleural to serum creatinine is a highly suggestive indicator of this condition.

In general, almost complete regression of the pleural effusion and normalization of urinary parameters are observed after management of the underlying anomaly and treatment of the pleural effusion. These results tend to confirm the diagnosis of urinothorax.

Compliance with ethical standards

Disclosure of conflict of interest

The author declares no conflict of interest

Statement of informed consent

All participants included in the study provided informed consent.

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