Urology Case Reports 26 (2019) 100957

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Functional medicine

Urinothorax causing massive left side pleural effusion in a young lady; case report and literature review

Alaa S. Bahjat[a], Kamiran J. Sadeeq[a], Ahamd Mohammad Sharif Tahir[b], Ayad Ahmad Mohammed[a,*]

[a] University of Duhok, College of Medicine, Department of Surgery, Duhok City, Kurdistan Region, Iraq
[b] Duhok Directorate General of Health, Azadi Heart Center, Duhok City, Kurdistan Region, Iraq

ARTICLE INFO

Keywords:
Urinothorax
Renal stone
Hydronephrosis
Thoracotomy
Double J catheter

ABSTRACT

Urinothorax is the presence of the urine in the pleural space. This condition is very rare and occurs due to unrelieved obstruction of urinary flow.

A 20-year-old female presented 7 days after cesarean section with tachypnea, and generalized abdominal pain. There was absent air entry over the left hemithorax. CT scan showed massive left pleural effusion and a stone obstructing the renal pelvis with hydronephrosis and peri-renal collection. The pleural fluid had high fluid creatinine level suggesting urine collection. Ureteroscopy done and double J catheter inserted.

The effusion became loculated, thoracotomy and pleural decortication done.

Introduction

Urinothorax is defined as the presence of the urine in the pleural space. This condition is very rare and may occur due to obstruction of the urinary flow. When there is unrelieved obstruction to the flow of the urine, it tracks from the retroperitoneal space to the pleural space through the diaphragmatic defects or the diaphragmatic lymphatics. The condition was first described in 1968. Since its first description, it drew the attention of the physicians and in the review of the literature there are around 60 reported cases worldwide.[1]

The pleural fluid smells like urine, transudate in type, and biochemical analysis shows low pH (less than 7.30), low glucose contents, and the pleural fluid – serum creatinine ratio is greater than one.[1]

This condition may be caused by various pathologies such as obstructive uropathy due to benign or malignant causes, renal trauma, ureteral surgery, renal biopsy, or instrumentation such as percutaneous nephrolithotomy, nephrostomy, extracorporeal shock wave lithotripsy (ESWL), and transplantation of the kidney. Based on the etiology it may be classified into 2 types: obstructive type and traumatic type which may be iatrogenic. It is usually ipsilateral to the site of the pathology in most of the reported cases, although bilateral urinothorax had been reported in some cases in the obstructive group.[2]

The treatment depends on the underlying cause, but the 2 main aspects are relieving the urinary outflow obstruction and draining the pleural urinary collection. Most cases have very good resolution.[3]

Case report

A 20-year-old female referred to emergency department of Azadi Teaching Hospital in Duhok city in the 7th day postpartum after cesarean section.

During the first week post cesarean section she developed fever and tachypnea with acute abdominal pain and admitted to the hospital.

On examination she had tachypnea with respiratory rate of 35 breaths/minutes, SPO2 88% on room air, BP 100/60 mmHg, PR 125 BPM, and Temp 38.5 °C.

On abdominal examination there was generalized abdominal tenderness with no guarding.

Examination of the chest showed limited chest expansion on the left side with absent air entry over the left side of the chest. Past history revealed frequent urological consultations during pregnancy for loin pain and attacks of hematuria. The patient had negative history for trauma or chronic medical conditions.

The white blood cell count was 34 000/cmm, normal renal function

* Corresponding author. University of Duhok, College of Medicine, Department of Surgery, Azadi Teaching Hospital, 8 Nakhoshkhana Road, 1014, AM, Duhok City, DUHOK, Kurdistan Region, Iraq.
E-mail addresses: ayad.mohammed@uod.ac, ayadduhok@gmail.com (A.A. Mohammed).

https://doi.org/10.1016/j.eucr.2019.100957
Received 21 June 2019; Received in revised form 26 June 2019; Accepted 28 June 2019
Available online 28 June 2019

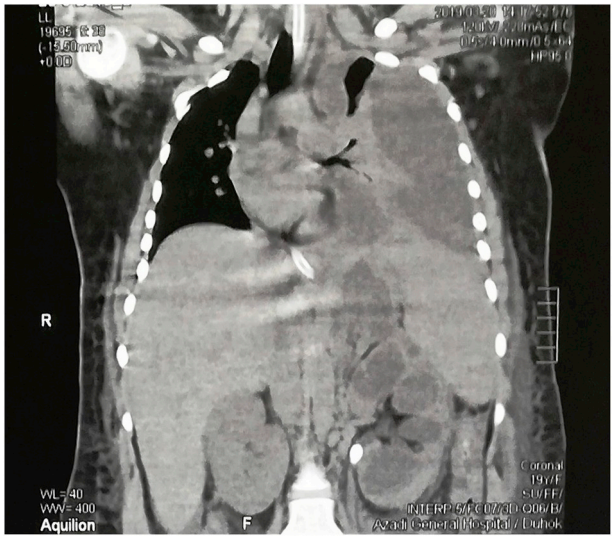

Fig. 1. CT scan of the chest and the abdomen showing a radio-opaque stone obstructing the left pelvi-ureteric junction causing hydronephrosis, perinephric collection and collection of the fluid (urine) in the left pleural cavity.

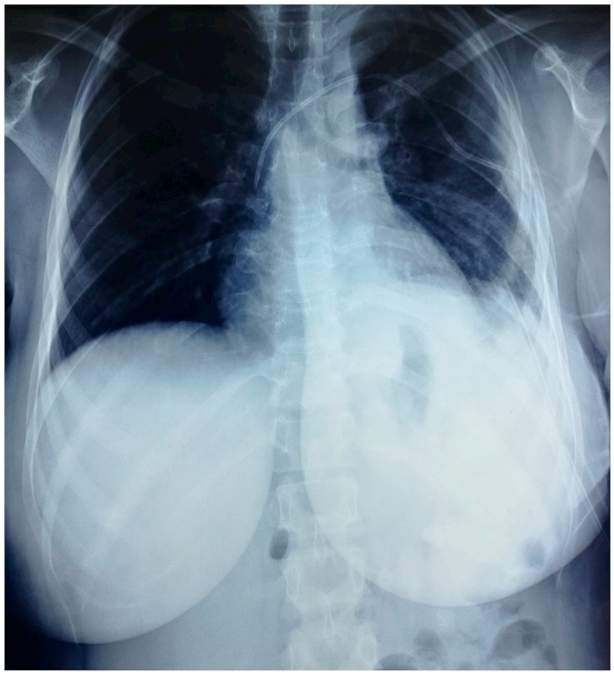

Fig. 2. Chest X-ray after insertion of the chest tube showing expansion of the left lung.

and hemoglobin level.

Chest X-ray revealed total left lung collapse and massive left side pleural effusion.

Ultrasound of the abdomen showed evidence of left hydronephrosis with impacted stone at the renal pelvis with loculated collection in the left sub-phrenic region.

CT scan of the chest & abdomen showed: a left renal stone obstructing renal pelvis with hydronephrosis and complicated by calyceal perforation with peri-renal collection, massive left side pleural effusion. Fig. 1.

Chest tube inserted and thick pus drained, the culture revealed gram negative bacteria.

The patient received parenteral broad spectrum antibiotics and there was some clinical improvement.

There was a continuous drainage through the chest tube which was about 700 cc/day. Biochemical analysis of the pleural fluid revealed high level of creatinine (13.6 mg/dl). These findings together suggested urine collection in the pleural space.

Urological consultation done and ureteroscopy showed obstruction of the pelvi-ureteric junction by a stone, double J catheter inserted.

The drainage through the chest tube decreased after the insertion of the double J catheter but the lung remained collapsed because the effusion became loculated. Decision for thoracotomy done, left side thoracotomy done, and chest cavity evacuated, then pleural decortication done, the post-operative chest X-ray showed complete chest expansion after one week and the chest tube removed. Fig. 2.

The patient was admitted for 1 month due to slow recovery and the need for thoracotomy and then discharged home with improvement of the clinical condition and normal investigations.

Discussion

Urinothorax should be suspected when there is pleural effusion and obstructed urinary tract with urine collection in the retroperitoneal region which is regarded as a predisposing factor for urinothorax. Increasing awareness about this rare condition and improvement in the imaging modalities lead to a better diagnosis.[3]

High level of pleural fluid creatinine level alone is used by some authors to diagnose urine collection in the pleural space, other causes of effusion with low glucose and low pH should be excluded such as hypoglycemia and acidosis.[1,3]

The most widely used imaging modality for the diagnosis is CT-scan. The determination of the fistula between the retroperitoneal and the pleural spaces is done by many imaging modalities depending on their availability and the presence of experience such as pyelography whether intravenous or retrograde pyelography, usage of intravenous indigo carmine, and Tc-99 m labelled DTPA kidney perfusion scanning. In our case the condition diagnosed from the CT-scan findings by the presence of obstructing stone at the pelvi-ureteric junction and the biochemical analysis of the plural fluid.[3]

Renal stones that are managed by percutaneous nephro-lithotomy (PCNL) are associated with many complications like pneumothorax, hemothorax, hydrothorax, or there may be urine leak and collection in the pleural cavity. The differences between this complication and the presentation in our case is that urinothorax in our case is spontaneous due to obstruction of the urinary flow, while after PCNL is mostly iatrogenic which may be due to diaphragmatic injury or collection in the perinephric space and retrograde flow to the thoracic cavity, the management of both conditions may be similar in many points.[4]

Up to date there is no systematic approach to treat this condition, so most management strategies are tailored for individual patients depending on the underlying cause and the clinical situation at presentation. Treatment options may include thoracentesis and chest drainage which should be combined with relieve of the urinary obstruction. The obstructive uropathy may be relieved by various methods

according to the cause ranging from urinary catheter, double J catheter placement, percutaneous nephrostomy, surgical treatment of the underlying pathology, and nephrectomy. Pleural decortication may be used in complicated cases when the urinothorax become infected and drainage is not successful.[5]

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.eucr.2019.100957.

References

1. Stark DD, Shanes JG, Baron RL, Koch DD. Biochemical features of urinothorax. *Arch Intern Med.* 1982;142:1509–1511.
2. Oguzulgen İ.K, Oguzulgen AI, Sınık Z, Köktürk O, Ekim N, Karaoglan Ü. An unusual cause of urinothorax. *Respiration.* 2002;69:273–274.
3. Handa A, Agarwal R, Aggarwal A. Urinothorax: an unusual cause of pleural effusion. *Singap Med J.* 2007;48:e289–e292.
4. Hsu L, Li H, Pucheril D, et al. Use of percutaneous nephrostomy and ureteral stenting in management of ureteral obstruction. *World J Nephrol.* 2016;5:172.
5. Toubes ME, Lama A, Ferreiro L, et al. Urinothorax: a systematic review. *J Thorac Dis.* 2017;9:1209.