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Case Report

Internal Medicine Section

Urinothorax: A Rare Postoperative Complication of Adrenalectomy

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ABSTRACT

Urinothorax is a rare condition defined by the presence of urine in the pleural cavity. Here we report a case of a patient with left sided transudative pleural effusion which developed following left adrenalectomy with perisplenic collection. The pleural fluid to serum creatinine ratio was found to be greater than one which confirmed the diagnosis. The objective of this case report was to describe this rare case and to alert the physicians to include urinothorax in their differential diagnosis of transudative pleural effusion especially following abdominal surgery.

Keywords: Pleral fluid creatinine, Retroperitoneal, Thoracostomy, Transudative pleural effusion, Urinoma

CASE REPORT

A 26-year-old lady homemaker, hailing from a southern state of India presented with abdominal distension and swelling for one year which was gradually increasing in size. The patient had history of recurrent episodes of holocranial headache for two years and was diagnosed with systemic hypertension which was treated with telmisartan and amlodipine. She had diabetes and irregular menstrual cycles with oligomenorrhoea.

The patients clinical examination revealed a blood pressure of 160/100 mm of Hg in the right upper limb in supine position. A vague mass per abdomen in left lumbar region was present. Her blood parameters revealed hypokalaemia with potassium of 2.2mEq/L (normal 3.5-5.5mEq/L) elevated serum levels of aldosterone of 79.93pg/ml (normal range – upto 15pg/ml), renin of 2.19ng/ml/h (normal 0.2-3.3ng/ml/h). Rest of the biochemical parameters was normal. X ray chest was normal, echocardiography showed concentric left ventricular hypertrophy with grade 1 diastolic dysfunction. CT abdomen showed a left adrenal mass suggestive of an adrenal cortical adenoma. Hence with the diagnosis of an adrenal cortical tumour with Conn's syndrome and secondary hypertension, the patient underwent left adrenalectomy.

On the fifth postoperative day, the patient developed fever with chills and rigor. On examination, she was febrile and tachypnoeic. There was tracheal shift to the right, with stony dullness and diminished breath sounds over the left infrascapular and infra-axillary area suggestive of pleural effusion on the left. Other system examination was normal.

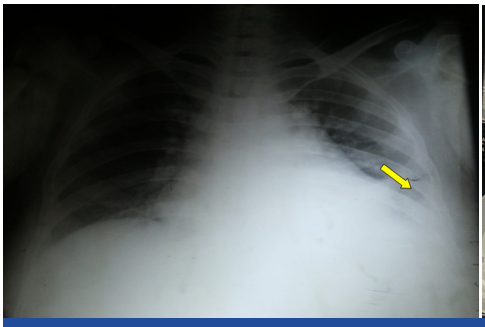
Her chest x-ray confirmed moderate pleural effusion on the left side [Table/Fig-1] which was corroborated with a CT chest showing left moderate pleural effusion [Table/Fig-2]. Pleural fluid analysis revealed transudative effusion with lymphocyte predominant cells. Pleural fluid ADA and amylase were negative. Pleural fluid gram stain, culture and sensitivity were negative. Pleural fluid / serum creatinine ratio was 6. CT scan of the abdomen showed perisplenic collection [Table/Fig-3].

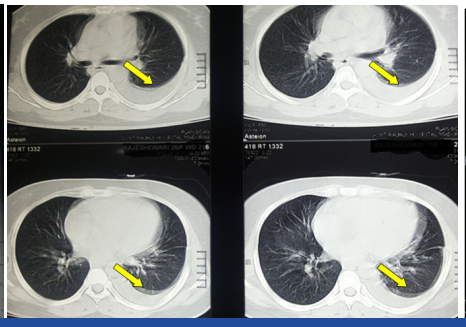
Thus with the history of adrenelectomy, development of pleural effusion and perisplenic collection, with pleural fluid /serum creatinine ratio of 6, the diagnosis of left side urinothorax was made. Intercostal drain was inserted and in four days, patient became afebrile, and the intercostal drain was clear.

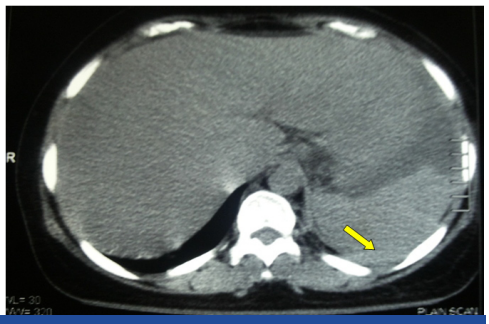
DISCUSSION

The presence of left pleural fluid was recognized in our patient as urinothorax. The leakage originating from the kidney or an injured uterus resulting in the accumulation of urine outside the urinary tract in the retroperitoneal space leads to urinoma formation. Urinoma formation usually occurs as a complication of surgical procedures in the kidney or the ureter like perforation, extracorporeal shock wave lithotripsy, retroperitoneal inflammation, trauma, urinary obstruction, and malignant diseases. From urinoma, urine may pool in the pleural space, forming urinothorax [1,2].

Urinothorax formation after obstructive uropathy with hydronephrosis or traumatic diaphragmatic disruption by blunt abdominal trauma occurs either through reabsorption and lymphatic drainage of extravasated urine from retroperitoneal urinomas, or by a mechanism of direct transdiaphragmatic passage from urinoma to the pleural cavity. Other rare aetiologies include retroperitoneal inflammatory processes, percutaneous endoscopic renal proced-







[Table/Fig-1]: Chest x-ray showing moderate left pleural effusion in a patient who underwent adrenelectomy. **[Table/Fig-2]:** Plain CT chest showing left moderate pleural effusion in the patient who underwent left adrenalectomy. **[Table/Fig-3]:** Plain CT abdomen in the patient showing perisplenic collection.

ures, polycystic renal disease, ureteral valves, extracorporeal lithotripsy and intra-abdominal compression from gravid uterus or lymphomatous masses [3,4].

Most often, patients with urinothorax present with dyspnea, flank pain, and fever and on clinical examination have high respiratory rate. Clinical examination findings are consistent with pleural effusion. For the detection of urinothorax, multiple imaging modalities may be helpful, a chest radiograph being the preliminary and sensitive investigation [1,2,5].

This uncommon pleural effusion is frequently unilateral, small-to-moderate and ipsilateral to the primarily urinary obstructed tract. Although classically a transudative effusion, rarely they present as an exudative effusion. The fluid is clear yellow, with a distinctive ammonia odour, with low protein and normal to high LDH. Though there have been reports of low pH and glucose levels, these are unreliable markers.

The diagnosis of urinothorax is accomplished by acquiring fluid through thoracocentesis in order to examine biochemically. Except for the occasional elevated LDH levels the pleural fluid usually fulfils Light's criteria for a transudate effusion [1,6]. Pleural fluid creatinine is always higher than the serum creatinine. The diagnosis can be confirmed by a pleural fluid to serum creatinine ratio greater than one. In our patient the pleural fluid creatinine was 6mg/dL and serum creatinine was 1mg/dL, thus satisfying the criteria (pleural fluid creatinine/serum creatinine>1).

On CT imaging, contrast-enhanced urine in the perirenal space, renal or other excretory tract pathology demonstrated by the extravasation into the retroperitoneum or pleural space, are seen. Renal scans may be done for the presence of urinopleural fistula. Currently, MAG-3 renal scans score over the Tc-99m labeled Diethylene Triamine Pentaacetic Acid (DTPA). According to some authors, when possible, invasive studies like retrograde pyelogram and endoscopy of the renal collecting system, might be justified [7].

We present this case to highlight this unusual complication of a common surgical procedure. The pathognomonic feature is a pleural fluid-to-serum creatinine ratio always above one, although some variability has been reported, depending on the stage of evolution. Microbiological and cytopathological studies should be done to exclude infective and neoplastic causes. In atypical situations or where the clinical suspicion of urinothorax is low, patients with recurrent effusions of undetermined aetiology should undergo medical thoracoscopy [7].

Treatment is directed at the primary cause and drainage of the fluid. For patients with large and moderate to severe symptomatic effusions simple tube thoracostomy is advised. When the patient is asymptomatic or has minor symptoms, it is reasonable to perform drainage by needle thoracocentesis because in most patients the urinothorax will clear once the primary obstruction is relieved [8].

CONCLUSION

As urinothorax is a rare but important differential diagnosis for pleural effusion developing following abdominal surgery, Physicians should have a high degree of clinical suspicion for its diagnosis. As in our case with left urinothorax following left adrelectomy, its presentation is usually ipsilateral to the urinoma with ratio of pleural fluid to serum creatinine more than one. Our patient was managed with intercostal drainage though correction of the underlying cause is usually sufficient for the spontaneous and prompt resolution of urinothorax.

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