Pyelo-hepatic abscess caused by renal calculi: A rare complication

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ABSTRACT
Neglected renal calculi can lead to a variety of complications secondary to obstruction and infection. Pyonephrosis arising in this scenario often presents as a urological emergency and requires urgent surgical intervention. In rare circumstances, when left unaided, the kidney is unable to contain the infection and spread of pus may occur into the surrounding spaces like the retroperitoneum and the peritoneum. We report a very unusual complication of pyonephrosis leading to a hepatic abscess. We believe this is the first reported case of an acute renal infection due to stone disease ascending into the liver.

Key words: Complications, liver abscess, pyelo-hepatic abscess, pyonephrosis

INTRODUCTION
Renal calculi leading to colic is one of the most common urological emergency. Calculi may lead to obstruction and infection, causing loss of renal tissue and function. This complication, often referred to as pyonephrosis, is considered a urological emergency and warrants prompt drainage and management. Presentation of pyonephrosis may vary from asymptomatic bacteriuria to septicemia,[1] and is occasionally complicated further by spread of purulent exudate into the surrounding spaces. We report a rare case where stone-induced pyonephrosis contiguously spread to the liver and presented as a hepatic abscess. This is the first case of its kind to be reported in literature.

CASE REPORT
A 25-year-old lady presented to the urological emergency with complaint of episodes of dull aching colicky pain in the right lumbar region for the past 1 year, which had increased in severity and become continuous for the past 2 weeks. Pain was associated with fever, chills, nausea, and anorexia. She also reported weakness and malaise, but did not give any history of urinary or bowel complaints. Physical examination revealed a pulse rate of 104/min, low blood pressure of 104/60 mm of Hg, respiratory rate of 22/min, and a temperature of 101°F. There was tenderness in the right hypochondrium and the right renal angle, but no visible fullness. Keeping a differential diagnosis of gall stone disease and pyonephrosis, an urgent ultrasound examination was done which showed grade III dilatation of the right kidney with internal echoes and multiple calculi, largest of size 18 mm, located in the pelvis. The liver showed a hypoechoic lesion of 10 × 10.2 cm in the right lobe. A breach in the renal capsule was demonstrated, communicating with the lesion in the liver. Laboratory investigations revealed marked leukocytosis, severe anemia (5.5 g/dl), mildly deranged renal function (blood urea 60 mg/dl, serum creatinine 1.6 mg/dl) and coagulopathy (International Normalised Ratio 1.63). Based on a working diagnosis of pyonephrosis with liver abscess with septicemia, the patient was resuscitated with fluids and given intravenous antibiotics and blood transfusion. Dehydration and coagulopathy were corrected and a contrast-enhanced computed tomography (CT) was obtained, revealing a hypodense peripherally enhancing lesion with air in the right lobe of the liver communicating with the upper calyx of the hydronephrotic right kidney with multiple calculi [Figure 1]. The function of the left kidney was normal as evident by normal contrast excretion. Right pleural effusion with consolidation of the right lower lobe of the lung was also seen. The patient’s condition improved on antibiotics, and right DJ stenting was performed along with an ultrasound-guided drainage of
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800 ml pus from the right lobe of the liver. Culture of both urine and pus grew *Escherichia coli*, sensitive to amikacin. She responded well to treatment and was discharged with a plan for right Percutaneous Nephrolithotomy after 6 weeks. On subsequent follow-up visits, ultrasonography showed minimal abscess in the liver.

DISCUSSION

Urinary lithiasis is the main etiological factor leading to pyonephrosis.\(^2\) It produces obstruction to the passage of urine and acts as a nidus for microorganisms, creating perfect conditions for accumulation of pus and destruction of functional parenchyma. Pyonephrosis has been better defined as a disease spectrum ranging from infected hydronephrosis, where kidney function is preserved, to xanthogranulomatous pyelonephritis, where the renal function is severely affected.\(^3\) This is further complicated when necrosed renal tissue gives way to the accumulating pus, leading to spread of infected exudates outside the kidney. A review of literature showed that rupture of pyonephrosis is relatively common into the peritoneum,\(^4\) and sometimes the retroperitoneum,\(^5\) both of which act as free spaces in immediate vicinity of the kidney for collection of pus. Rare reports of pyonephrosis causing nephro-bronchial fistula,\(^6\) splenic abscess,\(^7\) and renal vein and caval thrombosis\(^8\) also exist. Our search for literature regarding reno-hepatic communication revealed only one case where xanthogranulomatous pyelonephritis led to the formation of a pyelo-hepatic fistula\(^9\) in a middle-aged lady.

Considering the strong anatomical barrier offered by the Gerota’s fascia and the Gilsson’s capsule, it seems rather difficult to have pyonephrosis cause an ascending infection to the liver. However, a thorough history was suggestive of a primary renal pathology giving rise to a secondary liver abscess. Culture revealed *E. coli* with a sensitivity pattern suggesting urinary origin. Renal calculi were attributed as the nidus for infection.

The management of pyonephrosis is by urgent antegrade or retrograde drainage followed by definitive management of the underlying pathology. In view of the deranged coagulopathy, an urgent DJ stenting was done followed by aspiration of the residual liver abscess after correcting the coagulation profile. Patient was empirically managed on third-generation cephalosporin and aminoglycosides and she responded well.

The only reported case demonstrating the possibility of a renal infective pathology spreading to the liver is that of a pyelo-hepatic fistula following xanthogranulomatous pyelonephritis by Chung et al.,\(^9\) which was managed by partial hepatectomy and nephrectomy, a treatment befitting this more severe spectrum of pyonephrosis. Our case demonstrates the success of a conservative approach in managing this rare complication of renal calculi when detected early in its course.

REFERENCES

1. St Lezin M, Hofmann R, Stoller ML. Pyonephrosis: Diagnosis and treatment. Br J Urol 1992;70:360-3.
2. Lledó García E, Herranz Amo F, Moncada Iribarren I, Verdu Tartajo F, Duran Merino R, de Palacio Espafia A, et al. Initial treatment of pyonephrosis using percutaneous nephrostomy. Value of the technique. Arch Esp Urol 1993;46:711-8. [Article in Spanish]
3. Watt I, Roylance J. Pyonephrosis. Clin Radiol 1975;27:513-9.
4. Quaresima S, Manzelli A, Ricciardi E, Petrou A, Brennan N, Mauriello A, et al. Spontaneous intraperitoneal rupture of pyonephrosis in a patient with unknown kidney carcinosarcoma: A case report. World J Surg Oncol 2011;9:39.
5. Takashi M, Murase T, Sobajima T, Shimoji T, Miyake K, Mitsuya HA case of malignant fibrous histiocytoma occurring in the retroperitoneum with giant pyonephrosis. Hinyokika Kiyo. 1983 Aug;29:911-9. [Article in Japanese]
6. Hampel N, Sidor TA, Persky L. Nephrobronchial fistula. Complication of perinephric abscess secondary to ureteral obstruction and pyonephrosis. Urology 1980;16:608-10.
7. Hendaoui MS, Abed A, M’Saad W, Chelli H, Hendaoui L. A rare complication of renal lithiasis: Peritonitis and splenic abscess caused by rupture of pyonephrosis. J Urol (Paris) 1996;102:130-3. [Article in French].
8. Eijsten A, Leisinger HJ, Jucker A. Unilateral pyonephrosis with septic thrombosis of the renal vein and vena cava. Urol Int. 1986;41:77-9.
9. Chung SD, Chen KH, Chang HC. Pyelo-hepatic fistula. Urology 2008;72:524.

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