

## Subcapsular Hematoma as a Complication of Acute Pyelonephritis : A Case Report

A case of subcapsular hematoma, a rare complication of acute pyelonephritis (APN) is described. A 60-year-old diabetic woman was admitted with a 3 day history of fever and left flank pain due to acute pyelonephritis. On the third day in hospital, left flank pain worsened despite use of antibiotics available for the treatments of APN and hemoglobin rapidly decreased from 11.1 to 7.9 g/dL. Ultrasonography and abdominal CT showed left subcapsular hematoma. Renal angiography demonstrated an ovoid avascular zone between the capsular artery and parenchyme of the left kidney with no evidence of tumors or vascular abnormalities, such as arteriovenous malformation or fistula. Subsequent percutaneous drainage of this subcapsular hematoma was performed and showed old blood-colored drainage. Hereby, the possibility of subcapsular renal hematoma in the course of acute pyelonephritis is stressed as a rare complication.

Key Words : Hematoma; Pyelonephritis

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### INTRODUCTION

Renal hematoma without history of trauma or bleeding diathesis, either perirenal or subcapsular, is a relatively uncommon occurrence, which has been reported with the association of benign or malignant renal tumors, arteritis, arteriovenous malformation, ruptured cyst and chronic pyelonephritis (1). Recently, there were reports of renal hematoma in patients with emphysematous pyelonephritis (2, 3). However, there is no doubt that renal bleeding associated with APN is an uncommon complication when compared to the prevalence of other complications of APN, such as renal or perirenal abscess. We report a rare case of subcapsular hematoma complicating acute pyelonephritis.

### CASE HISTORY

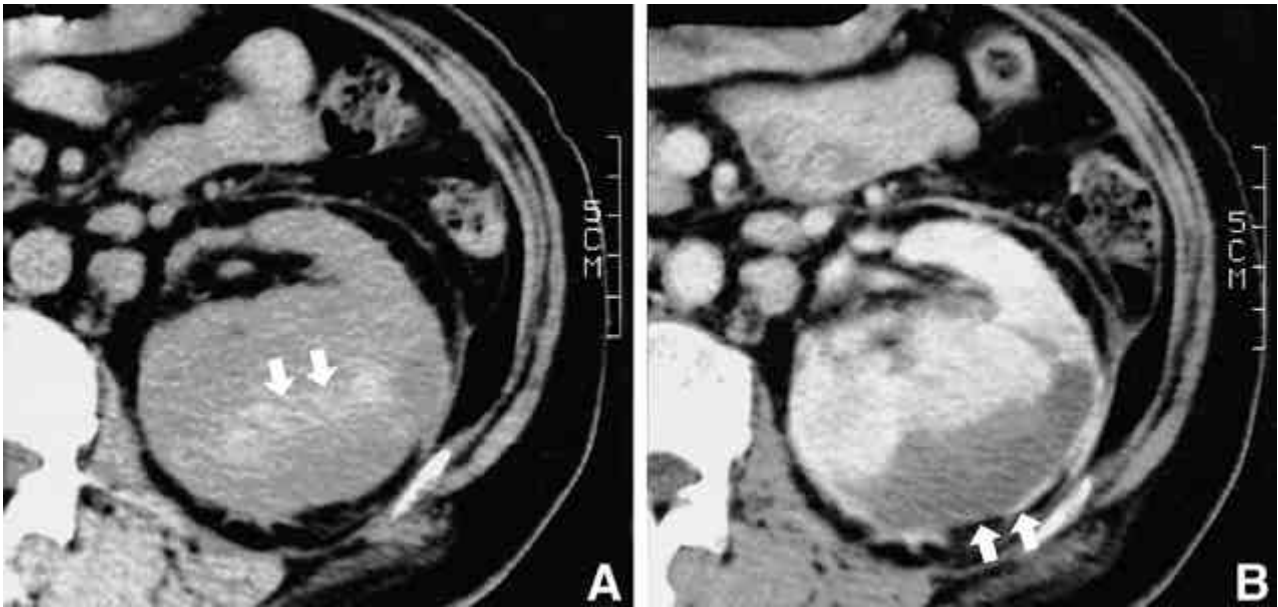
A 60-year-old woman with history of type II diabetes mellitus was admitted with acute left flank pain and fever for 3 days. Relevant laboratory data included, white blood count 12,500/mm<sup>3</sup>, hemoglobin 11.1 g/dL, urea 25 mg/dL, creatinine 0.9 mg/dL and blood glucose 180 mg/dL. Urinalysis showed hematuria, pyuria and bacteriuria. Abdominal ultrasonography (US) on the day of admission revealed globular swelling of left kidney with a hypochoic ovoid area involving its posterior upper pole compatible with acute focal bacterial nephritis, i.e., acute

lobar nephronia (not shown in figure). Both urine and blood cultures revealed *Escherichia coli*.

Despite the antibiotic coverage of 3 g ceftazidime and 180 mg tobramycin per day with conservative measures including intravenous hydration, the patient complained of progressive worsening of left flank pain with tender-

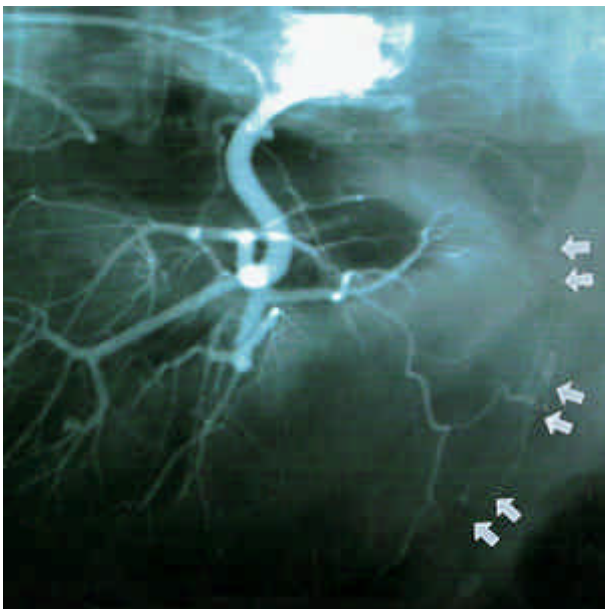


**Fig. 1.** Longitudinal ultrasonogram of the left kidney reveals fluid collection (arrows) in the subcapsular area with multiple fine internal septations (open arrows).



**Fig. 2.** A) Pre-enhanced CT scan reveals area of increased attenuation (arrows) in the posterior portion of the left kidney. B) Post-enhanced CT scan reveals low attenuated fluid collection with density of blood in the subcapsular area (arrows) with capsular enhancement and inhomogeneous nephrogram.

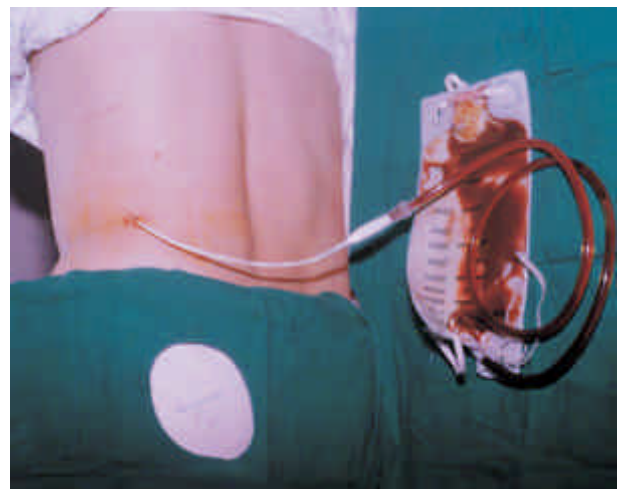
ness on the third day of admission. Simultaneously, hemoglobin dropped to 7.9 g/dL. Repeated US and CT demonstrated the presence of an abnormal subcapsular soft tissue density in the posterior lower pole of left



**Fig. 3.** Selective renal arteriography showed a hypovascular mass area with diffuse capsular neovascularization (arrows) and stretching with displacement of segmental and interlobar arteries in comparison to normal vessels in the lower pole. There is no evidence of vascular abnormalities, such as tumor neovasculation, arteriovenous malformation or fistula.

kidney, which corresponded with the density of hematoma (Fig. 1, 2). Selective renal angiography which was performed on the fifth day in hospital to rule out underlying renal tumors or other vascular lesions was negative for them (Fig. 3).

A percutaneous needle aspiration and drainage using biliary urinary drainage-catheter (Medi-tech<sup>®</sup>, Boston scientific corporation, MA, USA) was performed and this drainage catheter was removed after 5 days. The gross appearance of the initial drainage revealed the old blood, of which culture showed *E. coli*, same as those in the culture of urine and blood on admission (Fig. 4). The



**Fig. 4.** Percutaneous drainage shows grossly blood colored drainage in catheter and bag.

microscopic examination of bloody drainage showed purulent exudate compatible with bloody abscess. Pain and tenderness was resolved remarkably soon after the drainage, and she was discharged with complete recovery after sensitive antibiotic coverage for 3 weeks. Follow-up US just before the discharge revealed complete resolution of subcapsular hematoma mixed with abscess, and final diagnosis was made as acute purulent pyelonephritis complicated with subcapsular hematoma.

## DISCUSSION

Complications of APN include renal or perinephric abscess, emphysematous pyelonephritis, pyonephrosis and papillary necrosis (4). Nevertheless, as an unusual complication of APN, renal hematoma was reported in emphysematous pyelonephritis (2, 3). To our best understanding, this is the first reported case of renal hematoma complicated in simple APN in the English literature.

The causes of renal hematoma occurred without history of renal trauma were always congenital or acquired, the commonest being renal tumor (1, 2). Malignant tumors are responsible for about 30-35% of the cases; benign tumors (usually angiomyolipoma), 25-30%; vascular diseases, 20%; inflammatory renal disease, 5-10%; and miscellaneous conditions, the remainder (5-7). Inflammatory renal diseases usually include glomerulonephritis and chronic pyelonephritis such as xanthogranulomatous pyelonephritis (8).

The clinical presentation of these patients may vary greatly depending on the degree and duration of renal bleeding. Sudden onset of flank or upper abdominal pain, nausea and vomiting, low grade temperature and a decreasing hemoglobin are common findings (9). Since most of these symptoms related to renal hematoma are overlapped with those of APN except a decreasing hemoglobin, a high index of suspicion is generally required for the diagnosis of this rare occurrence when complicated with APN.

In our case, as shown in the other nontraumatic perirenal hematoma, the clinical picture included the classic Lenks triad consisting of acute flank pain, tenderness and signs of internal bleeding (3). Diagnosis of renal hematoma was considered on the basis of persistent and worsening abdominal pain despite the appropriate antibiotic coverage for APN, and rapidly dropping hemoglobin, and it was confirmed on the subsequent imaging studies. However, the high incidence of renal carcinoma or vascular lesions, such as periarteritis, arteriosclerotic aneurysms, arteriovenous malformations, among the previously reported cases of spontaneous subcapsular hematoma without history of trauma calls for the careful inves-

tigation rather than simply being concluded as a rare complication of APN (1). Renal angiography performed for these purposes did not reveal any evidence of the underlying malignancy or arteriovenous malformation.

Although the subcapsular hematoma is a rare complication of APN, it should be considered in the intractable persistence of symptoms despite antibiotic therapy, especially when unidentified source of bleeding is shown. An emergency US or CT would be essential in making its diagnosis as well as ruling out other complications of APN, such as renal or perirenal abscess and pyonephrosis (10).

In conclusion, it should be stressed that the uncommon complication of APN includes subcapsular hematoma. Diagnosis may be difficult unless a high index of suspicion is maintained. Therefore, once suspected, appropriate imaging studies including US or CT, or renal angiography, if necessary, should be performed for the earlier diagnosis and the subsequent appropriate management for it.

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