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Spontaneous Subcapsular Haematoma as a Complication of Acute Pyelonephritis: Imaging Findings

YESHWANTH RAJU NARAYANAN[1], SENTHIL KUMAR AIYAPPAN[2], SIDDHARDHA KOMMURI[3], YATHAM RAMA RAO[4]

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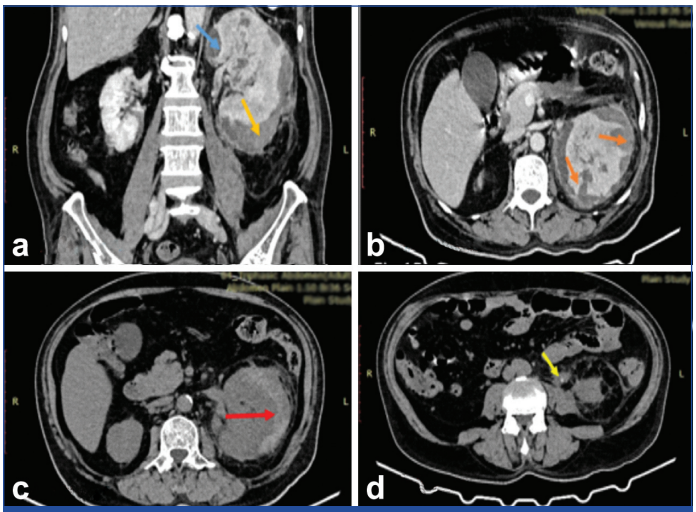
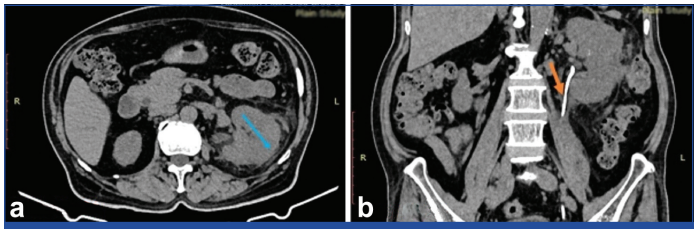
A 70-year-old male patient presented with complaints of fever and burning micturition for the past five days associated with left loin pain and vomiting. There was no history of haematuria. The patient was a known case of diabetes and hypertension and had been on irregular treatment for the past five years. Upon examination, the patient was hemodynamically stable, and there was tenderness in the left flank region.

Routine blood and urine investigations showed a reduced haemoglobin value (10.8 g/dL), normal White Blood Cells (WBC) count (13,300 cells/µL), an elevated Glycated Haemoglobin (HbA1c) of 10.0, normal urea (94 mg/dL), and creatinine (1.1 mg/dL). Plain and Contrast-Enhanced Computed Tomography (CECT) was done which showed an enlarged left kidney with peri-nephric inflammatory fat stranding and a subcapsular hyperdense collection. The enlarged left kidney showed multiple small irregular hypodense areas suggestive of abscesses [Table/Fig-1a]. A few of the small renal abscesses were communicating with the subcapsular haematoma in the left kidney, which measured approximately 2.7 cm in thickness [Table/Fig-1b,c]. There was mild hydroureteronephrosis due to a small 4 mm upper ureteric calculus [Table/Fig-1d]. The overall imaging findings suggested spontaneous subcapsular haematoma as a complication of acute pyelonephritis due to renal abscess rupture with an associated upper ureteric calculus.

The patient was treated with 12 units of subcutaneous insulin and intravenous injection of piperacillin and tazobactam 4.5 g four times a day for five days. The patient then underwent percutaneous drainage of the subcapsular haematoma followed by ureteroscopic retrieval of the left upper ureteric stone and Double J (DJ) stenting. A follow-up Computed Tomography (CT) was taken one month later, showing near complete resolution of the subcapsular haematoma with the DJ stent noted in situ [Table/Fig-2a,b].



[Table/Fig-1]: a) Coronal contrast venous phase image showing both renal abscess (blue arrow) and subcapsular haematoma (yellow); b) Axial contrast section venous phase image shows multiple hypodense non-enhancing areas in the left kidney–suggestive of renal abscess communicating with subcapsular haematoma (orange arrows). c) Axial non-contrast Computed Tomography (CT) section of the abdomen shows hyperdense fluid collection in the subcapsular space in left kidney-suggestive of subcapsular haematoma (red arrow). d) Axial non-contrast CT section of the abdomen shows a small 4 mm left upper ureteric calculus (yellow arrow).



[Table/Fig-2]: Follow-up non-contrast Computed Tomography (CT) Axial: a) and coronal; b) CT sections of abdomen show near complete resolution of subcapsular haematoma (blue arrow) with DJ (Double J shaped) stent in situ (Orange arrow).

Pyelonephritis with a renal abscess that ruptures into the subcapsular space, forming a subcapsular haematoma, is a rare, life-threatening complication when left untreated. Lenk's triad by Wunderlich, which includes tenderness, acute flank pain, and symptoms of internal bleeding, were common symptoms in spontaneous sub-capsular renal haematoma [1]. The present case had acute flank pain and tenderness; however, there were no signs of internal bleeding. Complications of acute pyelonephritis include perinephric abscess, emphysematous pyelonephritis, pyonephrosis, and papillary necrosis [1,2]. However, spontaneous subcapsular haematoma is very rare. A meta-analysis showed that the most common causes of spontaneous subcapsular haematoma are tumours, which is 61.5%, followed by vascular disease at 17% and infection at 2.4%. In 6.7% of cases, it is of idiopathic aetiology [1].

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 decreasing haemoglobin are common findings [3]. In this case, although there was flank pain, there was no significant drop in haemoglobin drop. Although ultrasound can be used for diagnosis, the specificity and sensitivity depend upon the operator. CT scan has high sensitivity and specificity and can help identify the cause of the haematoma; hence it should always be done. Magnetic resonance imaging can be an alternative to CT and can be done to differentiate haematomas from tumours. Digital subtraction angiography can be used to identify vascular causes and for embolisation [3].

Bajaj T et al., reported a case of spontaneous bilateral subcapsular renal haematoma in a diabetic patient with clinical features of pyelonephritis [3]. In that case, CT angiography of the abdomen and pelvis showed evidence of active arterial extravasation from the left renal artery. However, in the present case, there was no active arterial extravasation. Jankovic I et al., reported a case of spontaneous subcapsular renal haematoma as a complication of acute pyelonephritis [4]. In that case, ultrasound showed globular swelling of the left kidney with a hypoechoic ovoid area involving its posterior upper pole compatible with acute focal bacterial

nephritis. CT showed abnormal subcapsular soft-tissue density in the posterior pole of the left kidney, which corresponded with the density of the haematoma, similar to the present case. Kim HJ et al., reported a case of subcapsular haematoma as a complication of acute pyelonephritis in a diabetic patient with a renal abscess and upper ureteric calculus, like the present case [5].

Regarding the therapeutic approach, several authors suggest that the best method of management is non-surgical treatment, which involves percutaneous drainage of the haematoma with antibiotic coverage to treat the cause [3-5]. In this case, since the patient had an upper ureteric calculus, DJ stenting with the retrieval of the calculus was done and the subcapsular haematoma was evacuated percutaneously.

In conclusion, spontaneous subcapsular haematoma is an uncommon complication of acute pyelonephritis. Clinical diagnosis is difficult unless a high index of suspicion is maintained. Therefore, once suspected, appropriate imaging studies like Ultrasound (US) or CT, or renal angiography, should be performed for early diagnosis and appropriate treatment.

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PARTICULARS OF CONTRIBUTORS:
1. Junior Resident, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, Tamil Nadu, India.
2. Professor and Head, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, Tamil Nadu, India.
3. Junior Resident, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, Tamil Nadu, India.
4. Junior Resident, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Senthil Kumar Aiyappan,
Professor and Head, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu-603203, Tamil Nadu, India.
E-mail: asenthilkumarpgi@gmail.com

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