

Oncology

Case of perinephric abscess disguising as renal tumor

Putu Angga Risky Raharja, Agus Rizal A.H. Hamid*, Chaidir A. Mochtar, Rainy Umbas

Department of Urology, Faculty of Medicine, Indonesia University, Cipto Mangunkusumo Hospital, Jalan Diponegoro No. 71, Jakarta 10430, Indonesia



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Introduction

Perinephric abscess is an accumulation of pus in the perinephric space.¹ It frequently occurs as a secondary event to upper tract urosepsis, usually in relation with an infective staghorn stone.¹ Clinical presentation of perinephric abscess is notoriously silent. Therefore, diagnosing perinephric abscess will be difficult without the aid of imaging.² On the other side, malignant tumors with extra renal extension, perinephric hematoma, and urinoma may appear similar to perinephric abscess on imaging studies.³ Thus, a thorough examination should be performed in diagnosing perinephric abscess. We describe an unusual case of chronic pyelonephritis with perinephric abscess in 64-year-old man diagnosed after showing non-specific clinical presentation, conflicting laboratory results and unusual imaging findings.

Case presentation

A 64-year-old man was admitted with the chief complaint of right flank pain in the last 5 months. The pain was dull that came intermittently without referred pain. On clinical examination, non-tender palpable mass was found in the right flank. Laboratory

investigation found creatinine serum of 2.30 mg/dL, leukocyte of $23.47 \times 10^3/\mu\text{L}$, procalcitonin of 22.38 ng/mL. The urinalysis revealed leukocyturia, erythrocyturia and bacteriuria with positive leukocyte esterase. Urinary culture showed *Escherichia coli* with colony count of $>10^5/\text{mL}$. Ultrasonography (US) showed sub-capsular abscess in the right kidney. Right hydronephrosis grade III with multiple right nephrolithiasis were also observed. Abdominal computed tomography (CT) with contrast agent could not be performed due to increased creatinine serum (eGFR: 28.9 mL/min/1.73m²), therefore, a non-contrast abdominal CT was performed (Fig. 1). Chest X-ray showed normal findings.

Firstly, we assessed the patient with right sub-capsular kidney abscess. Retroperitoneal incision and drainage were performed, however there was not any fluid coming out. Patient then undergoing nephrostomy and blackish red-colored fluid was coming out of nephrostomy tube, suggesting a malignancy. The daily production from nephrostomy tube was 1.100 mL/24 hours. We reassessed the patient with right renal tumor cT3aN0M0 and performed right open radical nephrectomy with transperitoneal approach. Macroscopic finding of the kidney showed shifted renal parenchyma by cystic lesion with the size of 55 × 70 × 30 mm, filled by brown-yellowish serous fluid. Histopathological examination (Fig. 2) confirmed the final diagnosis of chronic pyelonephritis with perinephric abscess.

Discussion

Kidney abscess accounts for 0.2% of all intra-abdominal abscess, while perinephric abscess accounts for 0.02% of all abdominal abscess.⁴ Perinephric abscess usually occurs because of parenchymal disruption subsequent to fulminating pyelonephritis, particularly consequence of an obstructing infective stone.² The presence of infective renal staghorn stone in this patient propagates the collection of purulent fluid around the kidney.

Perinephric abscess poses a great diagnostic challenge, considering its non-specific clinical presentation.² It should be considered in any patient with fever and flank pain.² However, only 52% patients with perinephric abscess are accompanied by fever.¹ Our patient complained of intermittent right flank pain without fever. Other symptoms of urinary tract infection were denied, but laboratory results showed leukocytosis and leukocyturia. US examination suggested sub-capsular abscess. Despite the difference

* Corresponding author.

E-mail address: rizalhamid.urology@gmail.com (A.R.A.H. Hamid).

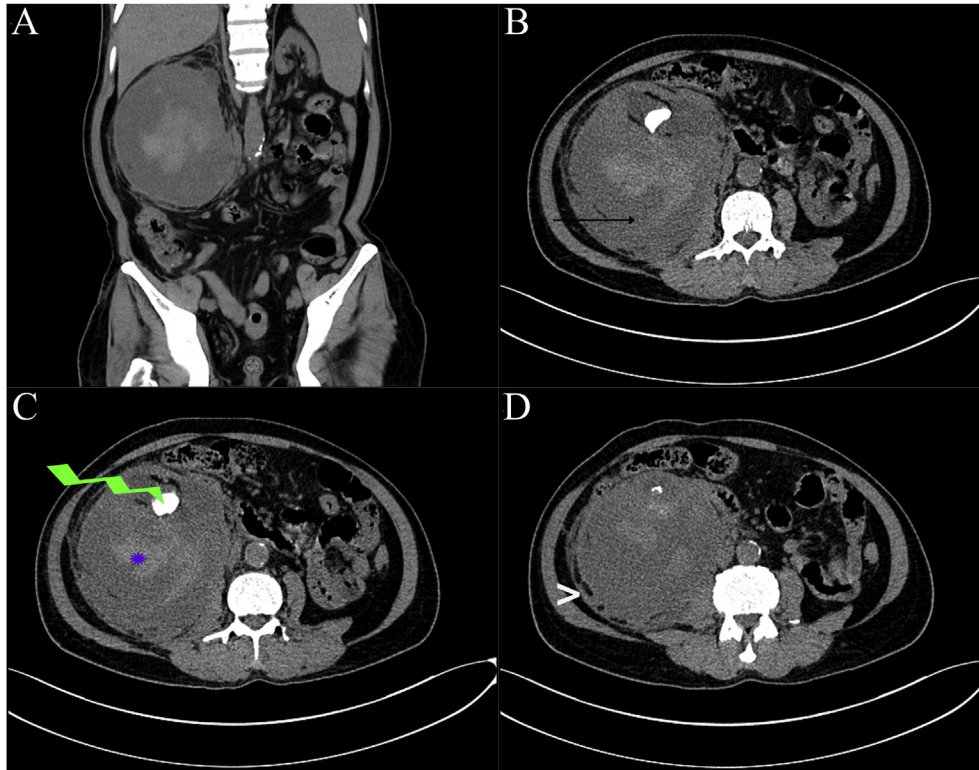


Fig. 1. A non-contrast abdominal CT showed the right kidney enlarges with the size of $16 \times 13 \times 12.5$ cm. Impression of mass in the posterior of right kidney (A; B, black arrow) with internal hyperdense lesion suggesting intra-tumoral hemorrhage (C, purple star), right staghorn stone with the size of 30×21 mm (C, green lightning), and perinephric fat infiltration (D, white arrow head). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

between sub-capsular abscess and perinephric abscess, laboratory and US findings lead to underlying infection process.

However, nephrostomy fluid drainage showed blackish-red bloody fluid, suggesting malignancy. Differential diagnosis of renal tumor then was made. This was also supported by non-contrast CT findings. Contrast-enhanced CT scan, the imaging mo-

dality of choice for such case, could not be performed due to renal failure. CT with contrast agent may show rim enhancement with central hypo-attenuation and thickened septa.³ Increasing of adjacent fat signaling and thickening of perinephric fascia are suggestive of an infectious process rather than a neoplasm.³ Radiologic findings of perinephric abscess and renal tumor on

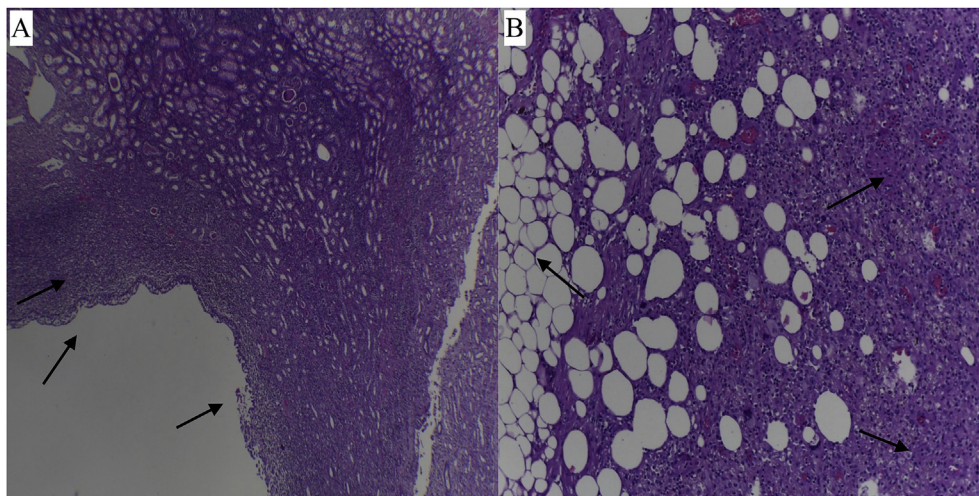


Fig. 2. A) Histopathology findings from renal tissue revealed renal parenchyma atrophy with acute and chronic inflammatory cells, fibrotic stroma, dilatation of pelvicalyceal system and erosion of the urothelial cells. B) Perinephric area revealed fat tissue with acute and chronic inflammatory cells, necrotic cells. No tumor mass was identified.

Table 1
Comparison of perinephric abscess and renal tumor on imaging modalities^{3,5}.

Imaging Modalities	Perinephric Abscess	Renal Tumor (Renal Cell Carcinoma)
US	Variable but tend to be sonolucent. Internal septation may occur.	Solid or cystic with variable echogenicity to the surrounding parenchyma.
Non-contrast CT scan	Low attenuation mass (0–25 HU), Gerota's fascia thickening, stranding and obliteration of perinephric fat.	Soft tissue attenuation between 20 and 70 HU. Some lesions frequently have necrosis area and some calcification.
Contrast-enhanced CT scan	The "rind sign", a rim of peripheral enhancement with central hypo-attenuation and thickened septa.	Variable enhancement, usually less than normal cortex. Larger lesions have irregular enhancement due to necrosis area.
MRI	Similar findings with CT scan. Hypo-intensity on T1-weighted images and hyper-intensity on T2-weighted images.	Heterogeneous on T1-weighted images. Hypo-intensity for papillary RCC and hyper-intensity for clear cell RCC on T2-weighted images.

several imaging modalities can be seen on [Table 1](#). This case suggests perinephric abscess may have similar CT findings with renal tumor, due to alteration on renal margin.

Conclusion

There is a possibility that perinephric abscess may present as renal tumor, especially in patients with absence or non-specific symptoms. Thus, thorough evaluation needs to be taken to confirm the diagnosis and to avoid unnecessary procedure.

Conflicts of interest

There is no conflict of interest.

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