

## Perinephric abscess presenting as posterior abdominal wall gangrene: An unusual presentation

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### ABSTRACT

Perinephric abscess is a common form of retroperitoneal infection. However, perinephric abscess presenting as posterior abdominal wall gangrene is very rare. We report the case of a 46-year-old diabetic male who presented with a history of fever with chills and rigor of 6 months duration, left loin swelling of 3 months, and blackish discoloration of the left side posterior abdominal wall of 1-month duration. He gives a history of multiple episodes of oral medicine intake for fever. However, when left loin swelling appeared, he went for indigenous treatment. Ultrasonography (USG) and non-contrast computed tomography abdomen were suggestive of a large collection in the left perirenal space and lumbar region involving iliopsoas with extension to the posterior abdominal wall. Workup for genitourinary and spinal tuberculosis was negative. Later, a USG-guided drain was inserted and pus was drained. After abscess drainage, gangrenous skin part was debrided and vacuum-assisted closure of the wound was done. Later, split skin grafting was done over the granulated wound in the posterior abdominal wall. Follow-up after 9 months of surgery, the patient was doing well.

**Key words:** Gangrene, Perinephric abscess, Posterior abdominal wall

**P**erinephric abscess means suppuration in perirenal fascia [1]. As perinephric abscess is uncommon, its incidence varies from 1 to 10 cases for every 10,000 individuals. Men and women are equally affected [2]. A perinephric abscess usually results from the rupture of an acute cortical abscess into the perinephric space or from hematogenous seeding from sites of infection. When a perinephric infection ruptures through the Gerota fascia into the pararenal space, it causes a paranephric abscess. When we did the literature review, there was no reported case of perinephric abscess which presented as posterior abdominal wall gangrene. It is in this scenario, we are reporting this case.

### CASE REPORT

A 46-year-old male presented to the urology outpatient department with complaints of recurrent episodes of fever with chills and rigor for the past 6 months, left loin swelling of 3 months, and blackish discoloration of the left posterior abdominal wall of 1-month duration. He is a known case of diabetes mellitus for the past 7 years. He gives a history of multiple episodes of oral medicine intake, whenever he gets a fever and later when he developed left loin swelling, he went for indigenous treatment. However, 1 month back, he developed blackish discoloration of the skin over the left side of the posterior abdominal wall (Fig. 1). Then, he consulted in a peripheral hospital and they referred him to our department.

On examination, he was hemodynamically stable with a blood pressure of 110/70 mm of Hg, pulse rate of 96/min, respiratory rate of 17/min, and temperature of 99°F. There was a local rise of temperature and tenderness over the left side of the abdomen. An ill-defined boggy swelling of size 25×20 cm present in the loin region extending to the left hypochondrium, left iliac fossa, and the left posterior abdominal wall and was more prominent on the posterior aspect of the left side abdomen. The fluctuation was positive with gangrene over the left posterior abdominal wall.

General investigations were done and it showed anemia (hemoglobin 7.8 g/dl), raised total white blood cell (WBC) count (17800/mm<sup>3</sup>) with neutrophilia, differential WBC count (polymorphs 93%, lymphocytes, and eosinophils 1%), raised serum creatinine (2.8 mg/dl), and blood urea (69 mg/dl). Urine routine examination showed pyuria. Urine culture was done and came as sterile.

Work-up for genitourinary and spinal tuberculosis was negative. Ultrasonography (USG) abdomen with pelvis showed a hypochoic fluid collection of maximum dimension 17 cm extending from the bed of the left kidney which compresses the same and tracking anteroinferiorly toward the left pelvis. Posteriorly, it has dissected into the subcutaneous plane tracking along the left iliac bone. Non-contrast computed tomography (NCCT) abdomen with pelvis report was a hypodense fluid collection noted involving mid and lower pole of the left kidney extending into perirenal space, posterior pararenal space, and

posterolaterally involving quadratus lumborum, longissimus thoracis, iliocostalis lumborum, and the left lateral abdominal muscles reaching up to the subcutaneous plane. The lesion was extending from L1 to S1 vertebral body level; possibly abscess. The left side hydronephrosis presents with renal pelvic anteroposterior diameter of 4.1 cm was also noted.

Magnetic resonance imaging spine (Fig. 2) was done to rule out spine involvement and report was a large T2 short T1 inversion recovery hyperintense collection in the left lumbar



Figure 1: Photograph showing the left posterior abdominal wall gangrene

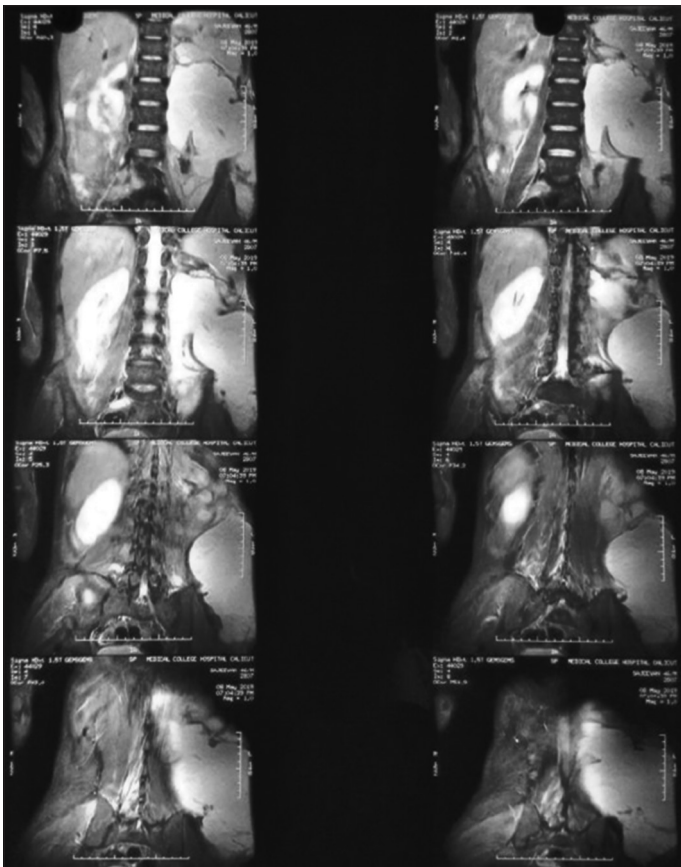


Figure 2: Magnetic resonance imaging showing the left perinephric abscess

region involving the left psoas and iliacus muscle extending to the posterior parietal wall in the paraspinal region. No evidence of extension to the spinal canal or neural foramina was seen. Part of visualized left kidney appears to be compressed by the collection. Vertebral bodies show normal signal intensity. Our final diagnosis was the left side perinephric abscess with posterior abdominal wall gangrene based on above-mentioned clinical and NCCT findings.

A USG-guided drain was inserted into the abscess cavity and pus was drained. The bacterial culture of drained pus was positive for *Escherichia coli*. After abscess drainage, gangrenous skin part was debrided and vacuum-assisted closure of the wound was done. Later, split skin grafting was done over the granulated wound in the posterior abdominal wall. After a follow-up after 9 months of surgery, the patient was doing well.

## DISCUSSION

Knowledge of the anatomy of perirenal space and its relations will help us to know better regarding the tracking of pus in case of a perinephric abscess. Perirenal space is an inverted cone of tissue that lies lateral to the lumbar spine and is confined by the anterior renal fascia (ARF) (Gerota fascia) and posterior renal fascia (PRF) (Zuckerkanndl fascia). The superior aspect of the perirenal space is open, with no intervening fascia between the upper perirenal space and the bare area of the liver. As far as, the medial extent is concerned, superiorly the right PRF fuses with the inferior coronary ligament, at the renal hilar level it fuses with the lateral margin of the fascia of the quadratus lumborum muscle and caudally it fuses with the anterior margin of the fascia of the quadratus lumborum muscle.

Medially, both perirenal spaces are partly in communication with each other at the level of renal hila because of relatively narrow channels between the perirenal spaces which are present anterior to the lower aorta and inferior vena cava at the level of the lower (third to fifth) lumbar vertebrae. Laterally, the extent of the perirenal space is limited by the fusion of the ARF and PRF. The inferior extent of the perirenal space is formed as follows: The PRF and ARF gradually converge to a point below the lower pole of the kidney; where they become closely related but not fused. The perirenal space blends loosely with the iliac fascia and periureteric connective tissue. Inferiorly, the perirenal space is open to the upper margins of the psoas muscles, ureter, and iliac vessels and to the prevesical and presacral spaces [3].

The majority of the infectious processes that involve perirenal space originate from the kidney. Even when it is confined to the kidney, inflammatory processes may produce thickening of the perirenal septa and pararenal fascia. When the inflammatory process breaches the renal capsule, the perirenal space may be involved focally or diffusely. The inflammatory process may eventually perforate fascia and accumulate in the pararenal spaces. The common causes for perinephric abscess are pyonephrosis especially when calculus is present in the kidney, hematogenous spread from other sites of infection, secondary infection of a perirenal hematoma, the result of bowel perforation,

Crohn disease, tuberculosis, spread of osteomyelitis from the thoracolumbar spine, etc. [4]. Emphysematous pyelonephritis which is commonly associated with diabetic mellitus may lead to perinephric abscess as its complication. The most common organisms causing this infection are *E. coli*, Proteus, and *Staphylococcus aureus*.

There are many studies that confirmed the association of diabetes with perinephric abscess. The traditional explanation for this association was glycosuria and its promotion of bacterial growth. Murtha *et al.* demonstrated in mouse models that compromise intracellular insulin signaling pathway led to the compromise of antimicrobial defenses and the mice were not able to effectively handle uropathogenic *E. coli* introduced experimentally into the urinary tract [5]. These observations show that the antimicrobial defenses of the kidney are dependent on insulin and the urinary tract infections associated with diabetes occur due to reduced expression of these key effectors of innate immunity. Uropathogenic *E. coli* bind to the bladder epithelium, invades the superficial cells and forms intracellular bacterial communities. Later, it spreads into the collecting tubules, causing an intense inflammatory response, which clinically manifests as pyelonephritis [6]. If not treated properly with antibiotics pyelonephritis can cause complications such as renal and perirenal abscess.

A study from Taiwan argues for more aggressive urological care in diabetic patients [7]. A case report by Chadwick and Thomas reported bilateral intraparenchymal and perinephric abscess in a diabetic patient [8]. According to a Tunisian study, complicated urinary tract infections such as emphysematous pyelonephritis and perinephric abscess are serious conditions in diabetic patients. When patients with renal or perinephric abscess develop loin mass or persistent pyrexia, there is a high chance of deterioration of clinical condition and stabilization becomes difficult [9]. Early diagnosis, proper clinical and radiological evaluation, and prolonged course of appropriate antibiotics are necessary to improve management results [10]. This holds true in our case scenario as the delay in proper treatment initiation led to all the complications.

When we did the literature review, there was no reported case of the perinephric abscess with the involvement of pararenal space which presented as posterior abdominal wall gangrene. The delay in starting proper treatment after its onset might have caused these complications. The patient had taken medicines initially for fever and later when he noticed left loin swelling he went to take

indigenous medications. As he is diabetic, he might have had left pyelonephritis leading to a perinephric abscess. However, when it went untreated, the left perinephric abscess might have perforated the Gerota's fascia producing left pararenal abscess. The reason for gangrene of the abdominal wall may be either due to pressure necrosis due to gross loin swelling or may be due to infective gangrene from underlying infection.

## CONCLUSION

This case report shows the need for early identification and adequate proper treatment of perinephric abscess to prevent severe complications and morbidity to patients.

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