

Shigella flexneri perinephric abscess and bacteremia

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Perinephric abscess, a collection of purulent material in the space between the kidney and Gerota's fascia, is a relatively rare, life-threatening but treatable disease.^{1,2} The most common route of infection is direct spread from the urinary tract, in which there is usually an underlying parenchymatous disease.¹ The source of infection may also be blood-borne.³ Rarely, a perinephric abscess results from gastrointestinal pathology.⁴ The microbiology of perinephric abscess is broad: *Escherichia coli*, *Proteus* species, and *Staphylococcus aureus* are the most common etiologic agents.³ Perinephric abscess due to *Shigella* spp has not been reported before. Surgical complications of shigellosis that have been described in the English language literature include appendicitis with or without perforation, colonic perforation, intestinal obstruction, peritonitis, and intraabdominal abscess.⁵ We report a case of *Shigella flexneri* perinephric abscess and review the pertinent literature.

Case

A 70-year-old male patient was admitted to Hamad Medical Corporation in June 2002, with complaints of right-sided abdominal pain, vomiting, and bloody diarrhea of 4 days duration. His past history was unremarkable apart from recently diagnosed diabetes mellitus. Physical examination revealed an ill-looking, restless, dehydrated patient with a blood pressure of 60/40 mm Hg, pulse rate 120/minute, temperature 35.6°C, and respiratory rate 30/minute. Abdominal examination revealed generalized guarding, with marked tenderness and fullness in the right iliac fossa. Per rectum examination showed fresh blood. Laboratory investigations found a white blood cell count (WBC) of 13 900/mm³ (95% segmented neutrophils, 3% lymphocytes, and 2% monocytes), hemoglobin 13.1 g/dL, platelet 238 000/mm³, serum creatinine 253 µmol/L, blood urea nitrogen 33.9 mmol/L, pH 7.22, pCO₂ 19.4 mm Hg, pO₂ 100 mm Hg, random blood sugar 17.3 mmol/L, lactic acid 1.9 mmol/L (normal, 0.5-2.2 mmol/L). International normalized ratio (INR) 1.7, fibrinogen level 7.55 g/L. Urine microscopy was normal except for the presence of red blood cells, and the urine culture was negative. Chest radiograph showed a raised right dome of the diaphragm, a few right basal atelectatic bands, and a small right-sided pleural effusion. A computed tomographic (CT) scan of the abdomen without contrast revealed right perinephric abscess, with anterior displacement of the right kidney, and mild hydronephrosis in both kidneys (Figure 1). Ultrasound of the prostate revealed an enlarged prostate. After hydration with intravenous fluids and administration of intravenous ceftriaxone and insulin, the patient had surgical drainage of the perinephric abscess through a small incision in the right flank under local anesthesia. Approximately 150 mL of pus were drained. Cultures of the pus and blood yielded *Shigella flexneri* sensitive to ciprofloxacin and ceftriaxone. Stool culture three days after admission was negative for *Shigella flexneri*. Stool microscopy was positive for occult blood but

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Figure 1. Computerized tomographic (CT) scan of the abdomen without contrast showing a large right perinephric collection with anterior displacement of the right kidney (arrows) associated with bilateral hydronephrosis.

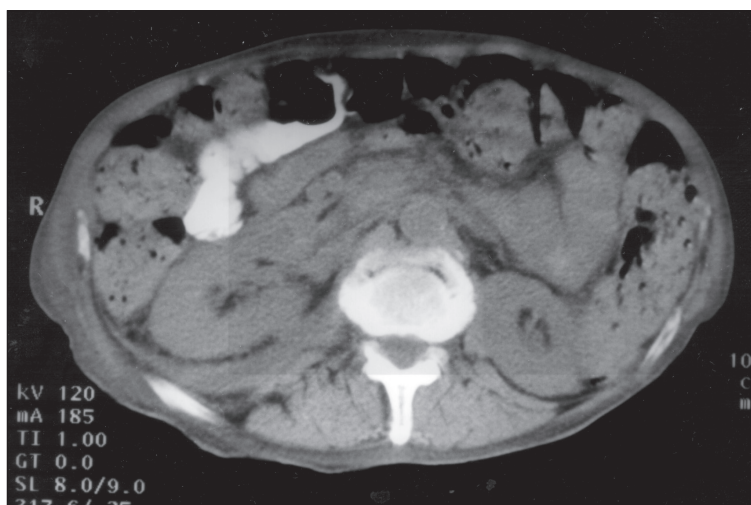


Figure 2. Follow-up CT scan of the abdomen with oral contrast showing almost complete resolution of the right perinephric collection.

negative for parasites. Colonoscopy was planned but was refused by the patient. After the result of cultures were available, ceftriaxone was discontinued and intravenous ciprofloxacin was added. The condition of the patient improved, with gradual improvement of renal function to normal levels before discharge. Intravenous antibiotics were given for a total of 21 days and then changed to oral ciprofloxacin. A repeat CT scan before discharge revealed almost complete resolution of the perinephric collection (Figure 2). He was discharged home on the thirty-third hospital day in good condition on oral ciprofloxacin, which he took for another 10 days.

Discussion

Infections with *Shigella* spp. are usually self-limited and confined to the mucosa of the distal ileum and the colon.⁵ Although *Shigella* spp. are highly communicable agents of bacterial diarrhea and are noted for invasion of the intestinal epithelial cells, they rarely produce extraintestinal infections.⁶ Specimens other than stool samples from which *Shigella* spp. have been recovered include those of the mesenteric lymph nodes, cerebrospinal fluid, synovial fluid, vaginal lesions, lungs, conjunctival sacs, corneal scrapings, blood, and cutaneous lesions of the penile shaft.⁷ *Shigella* spp. as a urinary pathogen has been occasionally described. Approximately 40 cases have been reported, presenting either as urinary tract infection or asymptomatic bacteriuria.⁸ The route by which *Shigella* spp can gain access to the urinary tract is often unclear. It is presumed that clinical infection or asymptomatic carriage within the gastrointestinal tract provides a source for organisms that infect the urinary tract by the ascending retrograde route.⁹ Bacteremia is another mechanism by which it might gain access to the urinary tract.⁸ Although colonoscopy was not done so as to definitely exclude colonic perforation with direct spread to the perinephric region, the CT scan findings were not suggestive, and we believe that bacteremia of colonic origin was the route through which *Shigella* spp reached the perinephric tissues in our patient.

Perinephric abscesses are a relatively rare condition, and a large proportion of their mortality is the result of failure to diagnose in a timely fashion.¹ This failure may be because of the frequently obscure or nonspecific nature of the clinical presentation. Diagnosis requires a high index of suspicion. The most common presenting features are fever, unilateral flank pain and tenderness. A flank or abdominal mass is present in less than 50% of

patients. Routine laboratory tests are nonspecific. Urine and blood cultures are positive in 60% and 40% respectively.² The key to making the diagnosis is in considering this entity in the differential and performing the appropriate radiologic studies in the form of ultrasound, CT scan, or magnetic resonance (MR) imaging.² Therapy requires both antibiotics and drainage, which is usually done percutaneously under CT or ultrasound guidance. Surgical drainage is undertaken when percutaneous drainage fails or is contraindicated.² The use of ceftriaxone initially in our patient was to cover for organisms of urinary tract origin, namely Enterobacteriaceae; however, when culture results and sensitivity were available, it was changed to intravenous ciprofloxacin, which was changed to oral ciprofloxacin when the patient's condition improved. The decision in our patient to drain the abscess surgically was made by the surgeon, who thought that the patient was very sick with a prolonged INR, and in order to ensure complete drainage of the abscess. A large number of organisms have been reported to cause perinephric abscess, but the most common are *Escherichia coli*, *Proteus* species and *Staphylococcus aureus*.³ Among the organisms that have been rarely reported to cause perinephric abscess are *Salmonella* spp. and *Streptococcus pneumoniae*.² Perinephric abscess due to *Shigella* spp has not been reported before.

The exact mechanism by which *Shigella flexneri* infected the perinephric tissues in our patient is uncertain. However, considering the normal urine microscopy, the negative urine culture for *Shigella flexneri* and the patient symptoms, our patient probably had bacillary dysentery, which resulted in bacteremia and seeding of the perinephric tissues. Stool culture for *Shigella flexneri* was negative in our

patient; however, this may have been due to the delay in submitting stool for culture for 3 days after starting antibiotics.

Our patient had several interesting features. It is widely believed by both physicians and microbiologists that bacteremia is a rare event in shigellosis. It is particularly rare in adults and is mostly seen in children¹⁰ or in the immunosuppressed, particularly AIDS patients, and in the malnourished.⁸ *Shigella* bacteremia is often associated with a high mortality, with a case fatality rate of 46%.¹¹ The other interesting feature in our patient is the fact that *Shigella flexneri* was the cause of his perinephric abscess. This association has not been reported before. A Medline search from 1966 to date found no similar cases. The reason for the lack of association is probably multifactorial, reflecting the rarity of the condition and possibly underreporting since most cases of shigellosis occur in poor countries where under- or no reporting is common.

Despite many unfavorable features in our patient, which included old age, an acute presentation with multisystem failure, and having a potentially fatal disease, he made a good recovery, and was discharged home ambulant with normal kidney function.

In conclusion, perinephric abscess is rare complication of shigellosis. It should be suspected in patients with perinephric abscess who have a history suggestive of dysentery, especially in the absence of renal parenchymal or collecting system abnormality. Management should follow the same line of treatment of perinephric abscesses due to other organisms. Early recognition and prompt drainage, in combination with appropriate antibiotics, should reduce the morbidity and mortality associated with this condition.

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