Bilateral psoas and bilateral perinephric abscesses complicating acute pyelonephritis in pregnancy

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ABSTRACT

Acute pyelonephritis complicates 1-2% of pregnancies and causes significant maternal and fetal morbidity and mortality. The diagnosis of renal tuberculosis (TB) is often delayed and commonly presents with sterile pyuria or along with other pyogenic organisms. We report a case where the diagnosis of renal TB was missed in a pregnant woman when she presented with acute pyelonephritis, septic shock, and acute renal failure. There was clinical recovery with antibiotics, but bilateral psoas and perinephric abscesses (TB, *Enterococcus sp.*, and *E. coli*) were diagnosed when she presented with loin pain and palpable left renal angle swelling. Bilateral psoas abscess due to TB in the absence of skeletal TB and human immunodeficiency virus infection is rare. The presentation of renal TB in pregnancy, its complications, and its management are discussed.

Key words: Acute pyelonephritis, pregnancy, psoas, abscess, nephrocalcinosis

Introduction

Acute pyelonephritis is one of the most common medical complications of pregnancy, occurring in 1-2% of pregnant women and may result in significant maternal and fetal morbidity and mortality.[1] The incidence of perinephric and psoas abscess complicating acute pyelonephritis is not known. Iliopsoas abscess was first described by Mynter in 1881 and is a well-recognized complication of tuberculosis (TB) of the spine.[2] Bilateral psoas abscess due to TB in the absence of skeletal TB and human immunodeficiency virus (HIV) infection is rare.[3] With the decline of *Mycobacterium tuberculosis* as a major pathogen in developed countries, psoas abscess was mostly seen secondary to digestive tract[4] and renal diseases.[3] Management of psoas abscess in the presence of renal dysfunction and pregnancy is a challenge.

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Case Report

A 28-year-old woman, second gravida, presented at 26 gestational weeks, with 20 day history of intermittent fever and generalized bodyaches, 2 months history of nocturia, and 1 month history of urinary urgency and frequency. She was treated locally with chloramphenicol and norfloxacin. She presented with septic shock and a presumptive diagnosis of acute pyelonephritis was made. The WBC total count was 26,000 (95% neutrophils, 5% lymphocytes), hemoglobin 7.5 g/dl, serum urea 154 mg/dl, serum creatinine 4.5 mg/dl, serum sodium 130 meq/l, serum potassium 5.5 meq/l, serum chloride 115 meq/l, and serum bicarbonate 7 meq/l. The arterial blood gas showed partially compensated metabolic acidosis (pH 7.05, HCO_3 09 mmol, PCO_2 21 mmHg, and PO_2 112 mmHg).

The urine showed plenty of pus cells, and all her blood and urine cultures were sterile. Her ultrasonogram of the abdomen showed enlarged, heterogeneous appearing kidneys with hyperechoic renal pyramids suggestive of medullary nephrocalcinosis [Figure 1] with no perinephric stranding. There was no evidence of hydronephrosis or calculus. She was empirically treated with meropenem 500 mg IV once daily and vancomycin 1 g IV once in 5 days. She remained febrile even after 72 h

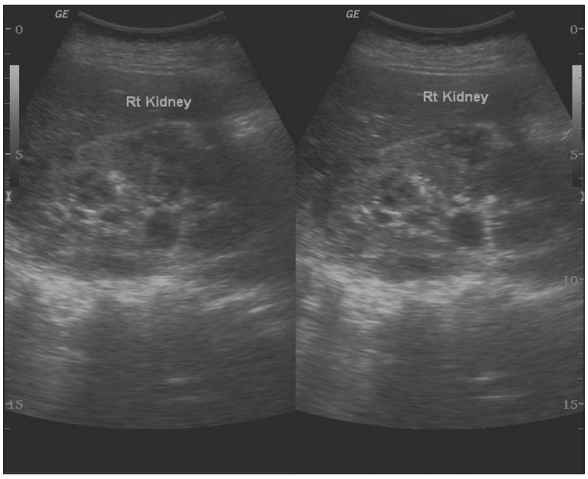

Figure 1: Ultrasonography showing medullary nephrocalcinosis

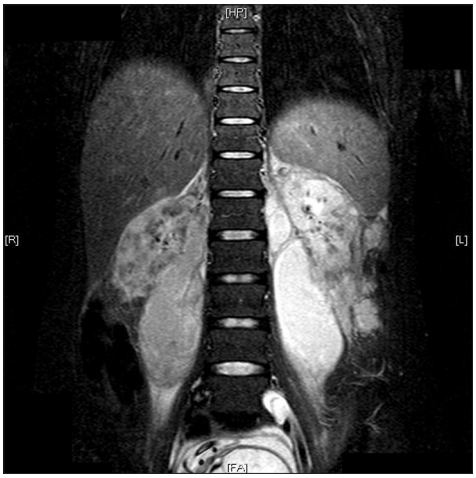

Figure 2: Magnetic resonance imaging showing bilateral psoas and perinephric abscesses

of antibiotics, and her urine and blood grew no organism. Injection amikacin was added after appropriate dose modification. She received four sessions of hemodialysis over 5 days for her severe renal failure and severe metabolic acidosis. He renal function rapidly improved by the end of 1 week and she became afebrile 48 h after adding amikacin. Amikacin was discontinued after 7 days due to fear of fetal ototoxicity, and meropenem and vancomycin were stopped after 10 days by which time her serum creatinine had improved to 1.8 mg/dl. Her fetus showed normal growth for the gestational age and she was discharged to come after 2 weeks with repeat urine culture and follow-up. Four days before her planned visit, she had developed bilateral loin pain. There was left renal angle tenderness and firm palpable swelling was noticed locally. Ultrasound showed bilateral perinephric collection with left psoas abscess and MRI scan showed significant bilateral psoas and perinephric abscesses [Figure 2]. A 10 F pigtail catheter was inserted in both the psoas abscesses. The "milk–coffee" colored pus showed 3+ acid fast bacilli (AFB) and culture grew *E. coli,* and there was a delayed growth of *Enterococcus* sp. The same organisms were isolated in repeated sampling on both sides. HIV was negative and her CD3 count was also within normal limits. Her corrected serum calcium and magnesium were 9.4 g/dl and 1.8 mg/dl, respectively, and her parathormone level was 71 ng/ml, low for her level of renal function. Her 24-h urine calcium was 112 mg/day and her urine calcium creatinine ratio was 0.12.

The patient was started on isoniazid, rifampicin, ethambutol, pyrazinamide, and pyridoxine for TB, and Inj. piperacillin and tazobactum for *E. coli* and ampicillin for Enterococci as per the antibiotic sensitivity. She developed oligohydraminos and intrauterine growth retardation during treatment. At 34 weeks, she developed labor pain spontaneously and delivered a 1.54-kg male baby. The child was given Bacillus Calmette–Guérin (BCG) vaccination and isoniazid prophylaxis. There was no relapse of psoas abscess 1 month after removal of both her pigtail catheters. Her renal function, which was stable, worsened after pigtail catheter insertion and after starting of ATT. The serum creatinine rose from 1.4 mg/dl to 1.9 mg/dl. No cause was identified and no change in therapy was made. Her renal function improved after 10 days to 1.2 mg/dl at the time of her delivery without any change in her medications. Four months after discharge, the serum creatinine improved to 0.8 mg/dl and the ultrasound showed no evidence of nephrocalcinosis.

Discussion

The psoas muscle is in close relationship with all the major abdominal and pelvic structures. Any infectious process in these regions can spread to the psoas muscle and progress into the posterior mediastinum or the anterior thigh. Secondary psoas abscess unlike primary abscess occurs in older and more debilitated people with preexisting diseases. The skeletal origin (50.5%) was the commonest followed by alimentary tract (24.8%) and renal (17.5%).[3] We believe that the kidney was the source of TB in our patient and the diagnosis was missed initially. Unlike conventional bacterial pyelonephritis, renal TB seldom has constitutional symptoms such as fever, night sweats, anorexia, and weight loss in less than 20% of patients. She had medullary nephrocalcinosis, a known complication of TB, and acute pyelonephritis with acute kidney injury severe enough to require dialysis, 2 weeks before the diagnosis of psoas abscess. Psoas abscess in pregnancy is a rare event. To our knowledge, renal origin of tubercular psoas abscess has never been reported. Diagnosing renal TB is difficult with the currently available resources and it is possible that it is being underdiagnosed. *E. coli* is the most common organism to cause secondary psoas

abscess followed by *Enterococcus* and *Bacteroides,*[3] like in our patient. This bacteriological profile mirrors the profile seen in complicated urinary tract infection. Secondary psoas abscesses are often mixed with *E. coli* and *Bacteroides* species predominantly.[5] Throughout the second hospital admission, she did not have any fever. She did not gain weight while on treatment despite being in the second month of her third trimester. Fever has been reported only in a third of the patients with tubercular psoas abscess as against 80% with other pyogenic organisms.[3] The only clinical findings that made us investigate her were new onset backache, persistent tachycardia, and sterile pyuria. It is reported that backache for more than 4 days was more often associated with complications such as perinephric and psoas abscess.[3] Hence we should have a lowered threshold to image patients with backache following an episode of acute pyelonephritis.[3] The classical symptomatic triad of psoas muscle abscess, lower back pain, limping, and persistent fever, is rare. Symptoms other than backache have been variably reported in patients with psoas abscess, e.g. fever (26-75%),[3] weight loss (11-37%),[3] and palpable mass (13%). Similarly, leukocytosis, increase in erythrocyte sedimentation rate (ESR), and anemia are reported with varying incidence.[3]

There are only few published reports of psoas abscess in pregnancy. The details of the clinical presentation, organism isolated, and modality of treatment are given in Table 1. Unlike conventional bacterial pyelonephritis, TB pyelonephritis is associated with constitutional symptoms in less than 20% of cases.[11] The diagnosis of TB in pregnancy may be more challenging, as the symptoms may initially be ascribed to the pregnancy. Table 1 shows clinical symptoms and signs in published case reports. Fever was seen in only 3/8 patients, whereas backache or pain while walking and tachycardia were almost always seen consistent with what we observed in our patient.

INH, rifampicin, and ethambutol are safe in pregnancy and pyrazinamide is increasingly being used in pregnancy though safety in pregnancy is not known. Currently, US-FDA lists the above antitubercular drugs as belonging to class C, which means that animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks. INH is prescribed with pyridoxine as in nonpregnant individuals and vitamin K supplement is recommended for mother and child whenever rifampicin is used in the last few weeks of pregnancy.

We speculate that the increase in serum creatining following starting antitubercular (ATT) was due to immune reconstitution with renal TB after starting ATT. Spontaneous resolution after worsening under

Table 1: Published case reports on psoas abscess in pregnancy

Psoas abscess	Symptom	Fever	Pulse rate	Other examination findings	Investigation	Organism	Surgical/Percutaneous drainage
Primary[6]	Pain on hyperextension Limp while walking	No fever	Tachycardia	Renal angle tenderness	Pyuria	*Streptococcus sangius*	Surgical drainage
Primary[7]	Limp while walking pain on walking	No fever	NA	NA	ESR high rest normal	NA	Surgical drainage
Primary[7]	Pain on walking	No fever	NA	NA	NA	Tuberculosis	Antitubercular treatment alone
Secondary[8]	Ectopic pregnancy, adbdominal pain, psoas abscess was incidental intraoperative diagnosis	No fever	Tachycardia	Abdominal pain	Anemia	Tuberculosis	Antitubercular treatment, surgical drainage
Secondary[9]	Severe backache	Fever	NA	Osteomyelitis multiple cutaneous abscesses	Leucocytosis	NA	Percutaneous drainage
Secondary[10]	Bachache	Fever	Tachycardia	Xanthochromotous pyelonephritis	Anemia, elevated ESR, leucocytosis	NA	Surgical drainage
Secondary[11]	Left lower abdominal pain	Fever	Tachycardia	Palpable left iliac fossa mass	ESR 150 mm/hour anemia leucocytosis	*Salmonella typhi* Tuberculosis	Surgical drainage
Secondary (current case)	Swelling, tenderness in the renal angle	No fever	Tachycardia	Visible left renal angle swelling	Leucocytosis anemia	Tuberculosis *Enterococcus sp. E. coli*	Percutaneous drainage

NA – Not available

these circumstances has been reported.[12] Clinical suspicion, radiological study with ultrasonography (USG) and CT, the last considered gold standard, along with microbiological culture of the pus are crucial to the diagnosis. The accuracy of the USG and CT in the diagnosis of psoas abscess is 41–95% and 95-100%,[13] respectively.

Average difference in birth weight between babies born to mothers with pulmonary TB and extrapulmonary TB was 215 g versus 251 g, respectively, when compared to control.[14] The perinatal mortality has been reported to be between 8.6% and 10%.[14,15] Maternal mortality is a rare event when identified early and treated. Congenital TB is a rare complication of in utero TB infection,[16] whereas the risk of postnatal transmission is significantly higher.[17] Antituberculous drugs are excreted in breast milk, though the dose is less compared with the therapeutic dose for infants. Breastfed infants may receive as much as 20% of the therapeutic dose of INH for infants, whereas other antituberculous drugs are less excreted. No toxicity has been reported from this small concentration in breast milk.[18] Percutaneous drainage (PCD) of the psoas abscess has become more common even with large abscesses. There are limited data on mortality, comparing antibiotics alone or PCD plus antibiotics or surgical drainage plus antibiotics in management of psoas abscess. However, the cure and relapse rates are comparable between surgical and PCD.[3] Patients with age >65 years, *E. coli* abscess, and positive blood cultures have bad prognosis for survival.[3] PCD guided by USG or CT is less invasive and equally effective for both uniloculated and multiloculated psoas abscess.

Conclusion

Low backache after an episode of acute pyelonephritis even in the absence of constitutional signs needs to be evaluated for perinephric and psoas abscess. Early diagnosis and appropriate treatment aided in successful outcome of the polymicrobial bilateral psoas and perinephric abscesses in pregnancy after an episode of acute pyelonephritis.

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