Case Report

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Atypical presentation of pyogenic iliopsoas abscess in two cases

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Summary **Iliopsoas abscess (IPA) is an uncommon diagnosis in medical wards. Herein, we present two unusual cases of IPA. First patient was an elderly diabetic patient who had gas-forming bilateral IPA caused by *Escherichia coli*. This infection proved fatal and patient succumbed on third day of hospital admission. Second patient was a young boy who had right sided sacroilitis with IPA. *Staphylococcus aureus* was isolated from the pus culture and patient was successfully treated without any sequelae.**

Keywords: Gas-forming iliopsoas abscess, pyogenic sacroiliitis, immunosuppression

1. Introduction

Iliopsoas abscess (IPA) was first described in year 1881 by Mynter. Since then a large number of case series and reports have been published in medical literature. The psoas muscle arises from the lateral borders and transverse processes of the 12th thoracic to the 5th lumbar vertebrae. The fibres of iliacus muscle which originates in the iliac fossa of pelvis blend with psoas muscle to form iliopsoas tendon which inserts into lesser trochanter of femur. Nerve supply of psoas muscle is from lumbar plexus (L1-L3) and iliacus is supplied by femoral nerve (L2-L4). This iliopsoas muscle is the strongest flexor of the hip joint. The iliopsoas muscle is related closely to various important anatomical structures like hip joint, sigmoid colon, vertebral bodies, appendix and abdominal aorta (*1*). It is also surrounded by rich venous plexus and retroperitoneal lymph nodes, which could explain the increased risk of hematogenous infections in this muscle.

Once IPA was considered always secondary to tuberculosis, but due to availability of effective treatment of tuberculosis, pyogenic IPA have become more common. Pyogenic gas-forming IPA is a rare entity with only few reported cases so far (*2-6*). Also, IPA which is secondary to sacroilitis is unusual (*7-10*). We present these two cases of IPA in this report.

2. Case Report

2.1. *Case 1*

A 61-year old diabetic and hypertensive male patient presented to the emergency department on 11th of November 2017 with complaints of high grade fever for 10 days and bilateral flank pain for 4 days. The fever was high grade with chills and pain was dull aching, persistent without any radiation. He also gave history of intermittent low back pain for last two weeks which was non-radiating and used to aggravate on standing. He was also a known case of coronary artery disease and chronic obstructive pulmonary disease, for which he was on regular medications. On examination, he was febrile and drowsy. His blood pressure was 130/80 mm of Hg, pulse rate-110/minute and respiratory rate 22/minute. Abdominal examination showed bilateral flank fullness and tenderness. Rest of the systemic examination was essentially normal.

Blood investigations showed significant neutrophilic leukocytosis, anemia, high procalcitonin levels, mildly deranged renal parameters and normal blood sugar levels (Table 1). A non-contrast computed tomography (NCCT) of abdomen was done which showed bilateral iliopsoas abscess with air pockets and diskitis at L4-L5 level (Figure 1). There was no evidence of any involvement of intra-abdominal organs. A computed tomography (CT) guided pigtail catheter insertion was done on the left side and about a litre of frank pus was drained out. He was empirically started on intravenous

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Table 1. Blood investigations of case 1 showing marked leukocytosis

Test name	Day 1	Day 2	Day 3
Hemoglobin	7.9 gm/dL	7.6 gm/dL	6.6 g m/dL
Total leukocyte count	43,100/mcL	45,300/mcL	50,229/mcL
Neutrophil	80%	70%	88%
Platelet	210,000/mcL	252,000/mcL	170,000/mcL
Urea	86 mg/dL	54 mg/dL	59 mg/dL
Creatinine	1.6 mg/dL	0.6 mg/dL	1.1 mg/dL
Procalcitonin	3.07 ng/mL		8.4 ng/mL

Figure 1. NCCT abdomen showing bilateral psoas abscess with pigtail in situ on left side (arrow).

Figure 2. Air pockets in anterior abdominal wall on CT imaging (arrow).

cefoperazone-sulbactam along with teicoplanin. Another pigtail was inserted on the right side which too showed frank pus. The patient showed minimal improvement after admission. But from day 2 of admission, he started complaining of sharp chest pain on the right side. On examination, there was palpable crepitus over the abdomen extending up to the right chest wall. A repeat imaging done showed multiple pockets of air in both the psoas abscesses which had extended into the subcutaneous tissue to involve the whole of abdomen and right side of anterior chest wall (Figure 2). Meanwhile, gram negative bacilli (*Escherichia coli*) was isolated from the pus which was sensitive to third generation cephalosporins, penems, and aminoglycoside. Tests for *Mycobacterium tuberculosis* and fungal elements were negative. He continued to deteriorate, developed septic shock, metabolic acidosis and eventually succumbed on 3rd day of admission, in spite of timely drainage of abscess and appropriate antibiotics.

2.4. *Case 2*

A 15-year old boy presented in first week of November 2017 with complaints of pain in his right buttock for a week, which was sudden in onset, severe in intensity, non-radiating, associated with high grade fever and restriction of movement around right hip joint. There was no recent history of trauma. For these complaints he received some over-the-counter medications, but his symptoms gradually worsened. On physical examination, he was febrile and was lying with both hips extended. His blood pressure was 110/70 mm Hg and pulse rate was 110/min. There was severe limitation of movement around right hip joint. Right posterior superior iliac spine and right hip joint was significantly tender.

Blood investigation showed leukocytosis with high levels of acute phase reactants (Table 2). Magnetic resonance imaging (MRI) of sacroiliac joint was also done immediately. There were articulate surface irregularities with marrow edema in the right SI joint along with a large collection beneath the iliopsoas muscle, tracking down the lateral pelvic wall and exiting through the ipsilateral obturator foremen to form an intramuscular septated collection (Figures 3 and 4). There were small pockets of collection in the iliopsoas, pelvic and gluteal muscles. A CT guided aspiration was done. The patient was empirically started on piperacillin-tazobactum along with vancomycin. Patient responded within 24 hours of antibiotics. Gram stain showed gram positive cocci which later proved to be methicillin sensitive *Staphylococcus aureus* (MSSA). He received intravenous vancomycin for two weeks. A repeat imaging at this juncture showed significant reduction in abscess size and resolution of right sacroilitis. His CRP and ESR levels were also normal after two weeks of antibiotics. He subsequently received amoxicillin-clavulanic acid for a month. After six weeks of therapy, patient was asymptomatic and had no limitation of movements.

3. Discussion

Based on pathogenesis, IPA can be divided into primary and secondary. Primary IPA occurs due to distant hematogenous or lymphatic spread of

Table 2. Blood investigations of case 2 showing raised acute phase reactants with leukocytosis

Test name	Day 1	Day 7	Day 14
Hemoglobin	12.2 gm/dL	11.8 gm/dL	11.3 gm/dL
Total leukocyte count	15,000/mcL	15,700/mcL	8,800/mcL
Neutrophil	80%	67%	58 %
Platelets	239,000/mcL	600,000/mcL	608,000/mcL
Urea	30 mg/dL	42 mg/dL	33 mg/dL
Creatinine	0.78 mg/dL	0.4 mg/dL	0.4 mg/dL
Procalcitonin	2.04 ng/mL		0.08 ng/mL
ESR(first hour)	40	12	20
CRP	121 mg/L	43 mg/L	4.01 mg/L

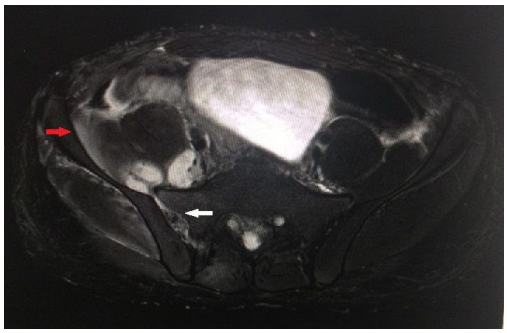

Figure 3. MRI showing right sided sacroilitis (white arrow) along with iliopsoas abscess (red arrow).

Figure 4. MRI (coronal section) showing a collection of about 11*4*3 cm along the anterior border of right SI joint beneath the psoas muscle, tracking along the lateral pelvic wall indenting the lateral wall of bladder (arrow) and exiting through the ipsilateral obturator foramen.

infection (*11*). Risk factors are intravenous drug abuse, immunocompromised states like diabetes, hematological malignancies, alcoholism and HIV infection (*12*). Young adults and children in tropical countries are more susceptible for primary infection. Secondary IPA occurs after direct extension of infection from an adjacent structure like vertebral bodies, genitourinary tract, gastrointestinal tract, aorta and hip joint (*13*). Primary and secondary IPA of skeletal origin are invariably monomicrobial and most common organism isolated is *S. aureus* (methicillin sensitive more common than methicillin resistant) (*14*). Gram negative bacilli are predominantly seen in secondary psoas abscess of gastrointestinal and genitourinary tract origin, *Escherichia coli* being the most common isolate (*15*). *M. tuberculosis* is still prevalent in developing countries like India. Other causative organisms include *Brucella*, *Klebsiella*, *Bacteroides*, *Proteus*, *Clostridium* and *Salmonella*.

Gas-forming psoas abscess is rarely reported and most commonly caused by gram negative bacilli (*2*). Diabetic patients are predisposed to this infection and have high mortality rate (*3*). In a study by Hsieh *et al*., 88 patients of psoas abscess were analyzed retrospectively and 27 patients (31%) among these had gas-forming psoas abscess. Gram negative bacilli (51.9%) was the most common gas-forming pathogen isolated from pus, followed by gram positive cocci (44.4%) and anaerobes (33.3%). In this study, *E. coli* was the most common gas-forming gram negative bacilli isolated (5 patients) (*4*). Apart from this series, all other reported cases of gas-forming psoas abscess are due to *K. pneumoniae* (*2,3,5,6*). Rapid catabolism along with impaired transport of end products from the site of inflammation leads to gas formation (*16*). The high glucose levels and impaired immunity in diabetic patient provide microbes a favorable environment for sustained growth (*17*). The common gases found in gas abscess are hydrogen, oxygen, carbon dioxide and nitrogen. Psoas abscess is generally treated with antibiotics and image guided percutaneous drainage. However, gas-forming psoas abscess carries an unfavorable outcome, so an early surgical intervention is recommended in these patients (*4*). Our first patient had bilateral gas-forming psoas abscess with spondlyodiscitis, caused by *E. coli*. Surgical intervention was deferred as patient's general condition was poor and instead percutaneous drainage was done. However, the outcome was no favorable in this case.

Secondary IPA occurs due to direct spread of infection from surrounding structures. Extension

of skeletal infection is the most common cause of secondary psoas abscess, with vertebral bodies being the most common site. Pyogenic sacroilitis (PSI) causing psoas abscess is rarely reported in literature (*7-10*). The sacroiliac joint is closely related to iliopsoas muscle, hence infection from sacroiliac joint can easily extend to iliopsoas muscle too (*10*). The most common reported symptom of PSI is lumbogluteal pain. MRI is the preferred imaging modality for diagnosing PSI. The microbiological diagnosis of pyogenic scaroilitis can be done by culture of blood and joint fluid aspirate. The most common causative organism is *S. aureus*, however other organisms like *E. coli*, *Pseudomonas*, *Salmonella*, *Streptococcus* and *M. tuberculosis* have been also implicated (*18*). Treatment of PSI remains drainage of abscess by minimally invasive technique along with appropriate antibiotics. The duration of intravenous antibiotic is generally two weeks, followed by oral antibiotics for 4-6 weeks depending on CRP levels, clinical improvement and radiological clearing of lesion (*18*). The prognosis is favorable if treated appropriately and repeat MRI after successful treatment may show irregular cortical bones with subchondral sclerosis but without any edema. The second case here had right sided PSI with multiple abscesses in ilopsoas, gluteal and pelvic muscles. Methicillin sensitive *S. aureus* was isolated and patient improved significantly after six weeks of antibiotics.

To conclude, pyogenic IPA can have varied clinical manifestations. Bilateral gas forming IPA is rare and carries poor prognosis if treatment is delayed. Sacroilitis causing IPA is also unusual, but has a favorable outcome. These cases can be seen in medical wards too, hence, treating physicians should be aware about these presentations of IPA.

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