

# Multifocal pyomyositis following normal vaginal delivery

## A case based report

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Here we present a rare case of a 38-year-old Caucasian primigravida with persistent pelvic pain postpartum after normal vaginal delivery. MR imaging was unremarkable and after being managed conservatively she was discharged on the fourth post-partum day. However, she represented two weeks later at the A&E department with features of sepsis, requiring an admission at the local intensive care unit.

Repeat MR imaging showed multifocal pyomyositis affecting the right lower psoas and ipsilateral iliacus muscle, right multifidus and erector spinae musculature, ipsilateral piriformis and the gluteus maximus muscle. This was associated with septic arthritis of the sacroiliac joints. The patient was stabilised and started on potent broad-spectrum antibiotics. An incision and drainage was performed with pus cultures being positive for *Escherichia coli* and *Streptococcus gallolyticus*. Despite treatment, patient was still febrile and subsequent MR imaging showed persistent abscess formation in the iliacus together with septic arthritis. A CT guided drain insertion to which she responded well. After this 16-day hospital stay the patient was discharged in a stable general condition, being able to maintain all her previous activities of daily living. She was followed up regularly at orthopedic outpatients.

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## INTRODUCTION

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Iliopsoas abscess formation is a rare phenomenon with an incidence of 0.4 in 100,000 per year in the UK (Shields et al, 2012) being three times commoner in males (Agrawal et al., 2002). Patients who are immunosuppressed, diabetic or suffer from renal failure are at increased risk. Psoas abscesses can be either primary through hematogenous spread or secondary through infection or inflammation in the surrounding areas.

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## CASE REPORT

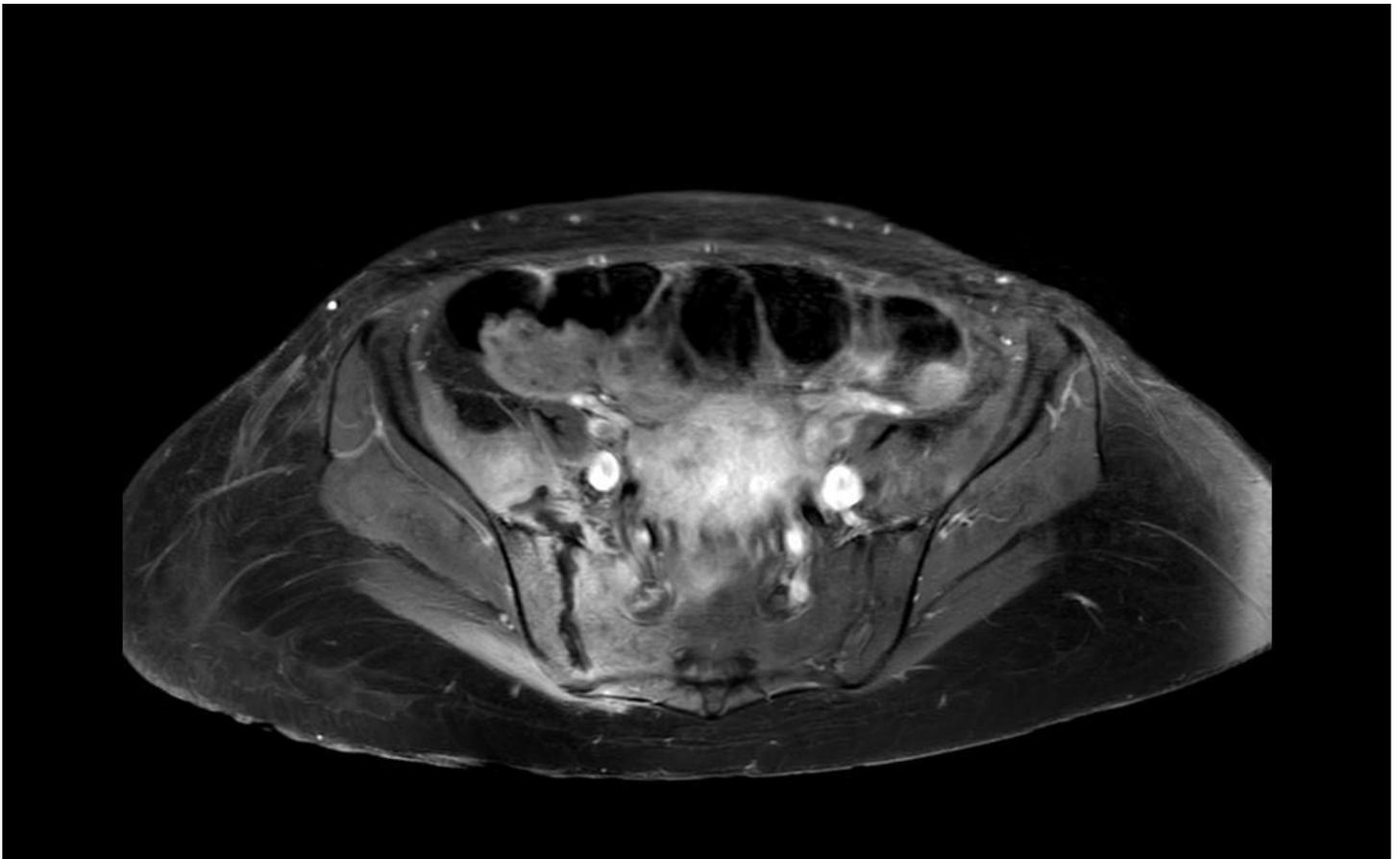
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A 38-year-old previously healthy caucasian primigravida reported persistent pelvic pain postpartum after normal vaginal delivery. MR

imaging of her pelvis was unremarkable. She was discharged home on NSAIDs and a pelvic support, however two weeks post discharge the patient was readmitted in view of a three-day history of deterioration in general condition – febrile with a fever of 39 degrees Celsius & exhibiting features of sepsis, requiring admission to intensive care. A full septic screen was performed together with a repeat MRI of the pelvis. The latter showed multifocal pyomyositis affecting the right lower psoas and ipsilateral iliacus muscle bellies, right multifidus and erector spinae musculature, ipsilateral piriformis and the gluteus maximus muscle bellies (Figures 1,2,3.).

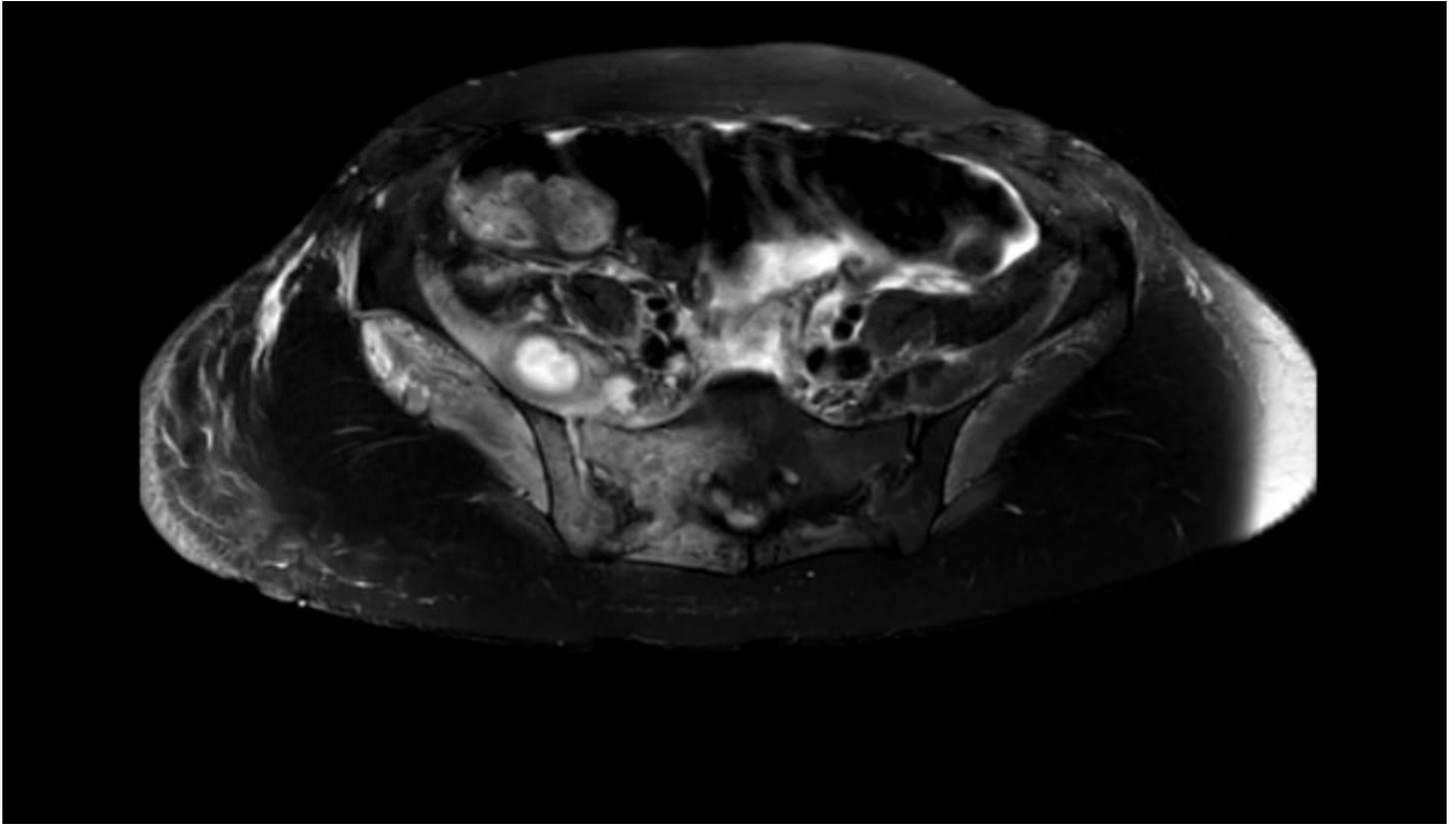
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**Figure 1** Cross-sectional T1 weighted MR imaging of patient’s pelvis with multifocal pyomyositis and noticeable involvement and oedematous changes at right sacro-iliac joint



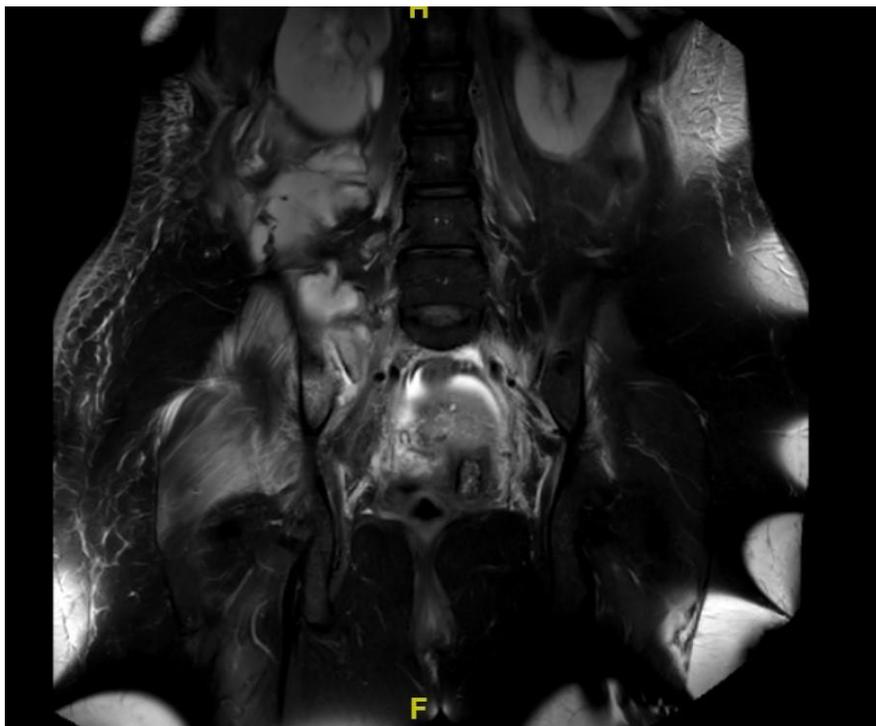
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**Figure 2** Cross-sectional T1 weighted MR imaging showing an abscess underneath the iliacus muscle in frontal to the SI joint

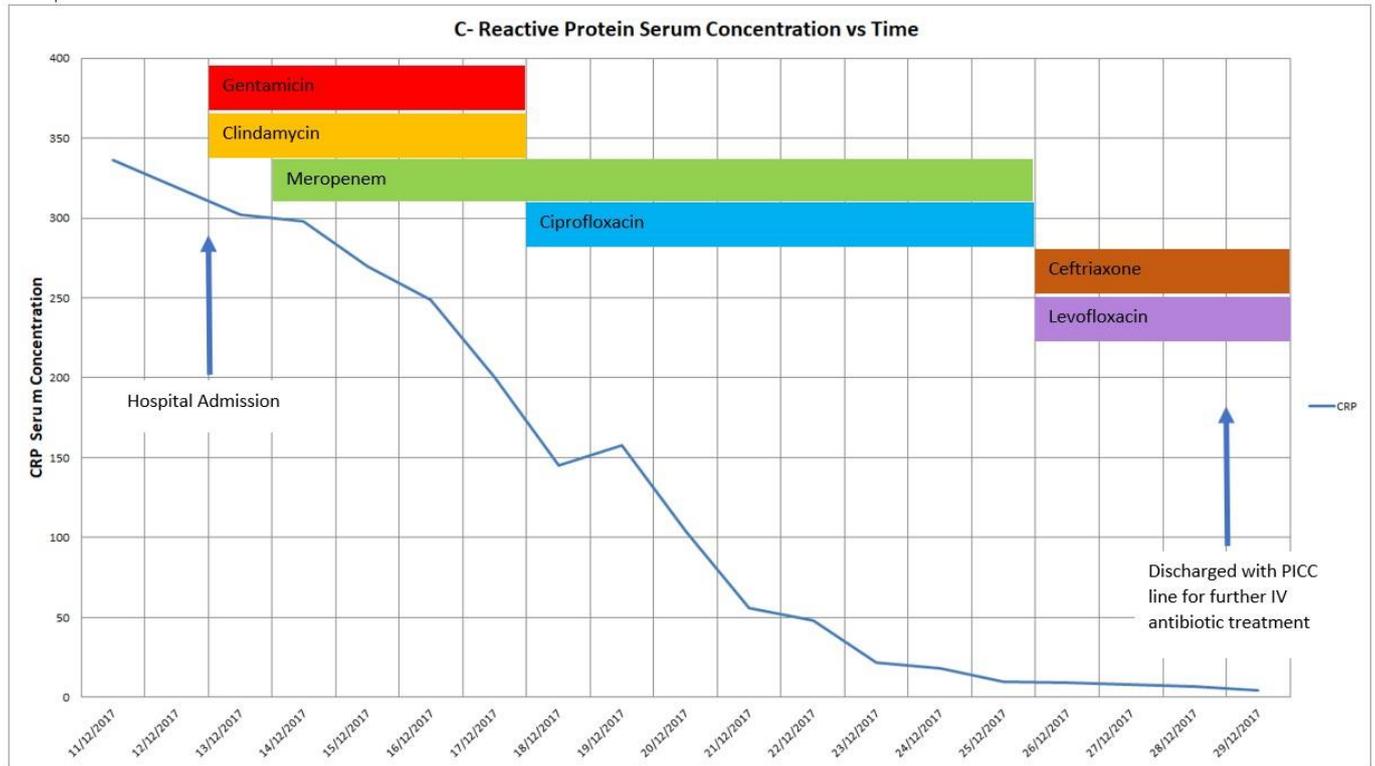


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**Figure 3** Cross-sectional T1 weighted MR imaging showing the abscess tracking over the sacroiliac joint to the muscles of the back



**Figure 4** Graph showing relation between Time (x-axis) and C-reactive protein serum levels (Y-axis). Superimposed by the date of onset and termination of Intravenous antibiotics



This was associated with septic arthritis of the sacroiliac joints. The patient was treated with Gentamicin, Meropenem and Clindamycin. One large collection extending to the gluteal region was amenable to surgical drainage and cultures grew positive for *Escherichia coli* and *Streptococcus gallolyticus*. A further intrapelvic collection was drained by a CT guided aspiration and a drain was left in situ. Antibiotics were switched to Levofloxacin and Ceftriaxone and were given for another 3 weeks post-discharge via a PICC line (Figure 4). The patient was deemed fit for discharge after 16 days of intravenous antibiotics. Rehabilitation at the physiotherapy department was organised and she was followed up regularly at outpatients by the obstetricians, orthopaedic surgeons and the infectious diseases team.

#### BACKGROUND

Pyomyositis is a purulent infection affecting originally skeletal muscle arising via hematological spread, usually associated with abscess mass formation. This infection may occur in children aged two to five years, but more commonly in adults, with males being predominantly affected. There is a tendency of increased incidence in immunocompromised individuals such as those suffering from Human Immunodeficiency Virus, diabetes mellitus, malignancy and individuals being treated with immunosuppressants. Recent literature notes an increased preponderance of cases in individuals residing in temperate and tropical climates. Other predisposing factors include trauma, concurrent infection and malnutrition. In the cases reported in literature common factor was muscle injury

due to exercise or trauma. As yet the mechanism of the pathophysiology of pyomyositis is poorly understood.

Multiple case based presentations repeatedly noted pyomyositis following vigorous exercise. They postulated that this may be due to increased muscle perfusion due to trauma providing additional iron to the muscle bed favoring bacterial growth. An alternative hypothesis could be related to hematoma formation.

The first mention of pyomyositis occurring secondary to vaginal delivery was first noted in 2011 by Gaughan et al., whereby they noted that the patient's vaginal delivery was a causative factor that instigated the process of bacteremia.

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## DISCUSSION

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### Anatomy

The iliopsoas compartment is extraperitoneal and contains the psoas muscle and the iliacus. The psoas muscle extends from the lateral margin of the 12<sup>th</sup> thoracic vertebra to the 5<sup>th</sup> lumbar vertebra and inserts at the lesser trochanter of the femur. Its muscle fibers blend with the iliacus and together form the major flexors of the hip. It is innervated by L2, L3 & L4 nerve roots. It has a large blood supply and is in close proximity to other organs such as sigmoid colon, appendix, jejunum, abdominal aorta, ureters, kidneys, pancreas, spine and iliac lymph nodes. This makes it more prone to abscess formation which can be either primary or secondary (Mallick et al., 2004).

### Aetiology

An iliopsoas abscess refers to a collection of pus in the iliopsoas compartment. This was first described by Mynter in 1881. Iliopsoas abscess can be primary following

haematogenous spread of infection (Walsh et al., 1992). This is more common in young males, diabetics, intravenous drug users, immunocompromised or malnourished individuals, or those who have renal failure or hematological malignancies. Secondary psoas abscess results from direct spread of infection from the adjacent organs such as diverticulitis, appendicitis, urinary tract infection, septic arthritis, vertebral osteomyelitis or infected abdominal aortic aneurysm (Ricci et al., 1986).

In a case series Ricci et al. (1986), noted worldwide difference in the aetiology of iliopsoas abscesses. Primary iliopsoas abscess is more common in Asia and Africa while secondary abscess formation is more common in Europe and North America (Ricci et al., 1986).

Despite the patient being of Maltese origin, her iliopsoas abscess appeared to be primary. We postulate that in this case observed locally, the muscle trauma and inflammation related to the normal vaginal delivery might have increased blood perfusion with iron deposits feeding bacterial growth. Muscular hematoma formation with superseding inflammation may also have played a role in this case.

### Microbiology

Various pathogens can lead to the formation of iliopsoas abscess with *Staphylococcus aureus* being most common in primary cases. *Streptococcus* and *Escherichia coli* are more common in secondary abscess formation (Agrawal et al., 2002). Some cases also reported the presence of *Proteus* (Gruenwald et al., 1992), *Bacteriodes* (Melissas et al., 2002), *Clostridium* (Wells et al., 1985), *Yersinia enterocolitica* (Kahn et al., 1984), *Klebsiella* (Change et al., 2001) and *Mycobacterium kansasii* (Simms & Musher, 1998). In the past iliopsoas abscess was a known complication of

spinal tuberculosis also known as Pott's syndrome (Mallick et al., 2004).

### **Incidence**

Iliopsoas abscess formation is a rare phenomenon with an incidence of 0.4 in 100,000. It is three times more common in males. Due to its insidious presentation, iliopsoas abscesses lead to increased morbidity and mortality. Mortality complicates 2.4% of primary and 18.9% of secondary abscesses (Melissas et al., 2002). Mortality can be as high as 100% if the abscess is not diagnosed and drained on time (Thongngarm & McMurray, 2001).

### **Clinical Features**

The clinical presentation of iliopsoas abscess includes a triad of fever, back pain and limp. However, this presents in only 30% of cases. Back pain is the most commonly encountered symptom in these cases with a mean duration of 10 days prior to presentation (Chern et al., 1997). Other symptoms include flank or abdominal pain, malaise, weight loss and lump in the groin. The presentation of these abscesses is usually vague and non-specific making them more difficult to diagnose. Thus, they can be easily confused with other conditions such as arthritis, vertebral osteomyelitis, lumbar strain, femoral hernia, tumour or inguinal lymphadenopathy (Bar-Dayyan et al., 1997).

### **Investigations**

Blood investigations are non-specific for iliopsoas abscess. Routine CBC, CRP and ESR are indicated in cases of sepsis as they can help to assess response to treatment. Blood cultures and urinalysis are also important to identify the source of infection and causative micro-organism. Blood cultures are positive in 50% of cases. Leucocytosis is the most

common feature. However, anaemia and pyuria can also be present (Riyad et al., 2003).

Imaging includes ultrasonography. However, this is highly operator dependent and is diagnostic in only 60% of cases (Isdale et al., 1994). The gold standard investigation is a IV contrast-enhanced spiral CT scan with 90% sensitivity. Magnetic resonance imaging is occasionally preferred as it can help to discriminate between soft tissues and enhances the abscess walls without using contrast. The ultimate diagnosis is achieved by CT guided percutaneous drainage and fluid culture (Perez-Fernandez et al., 2006).

### **Management**

The management of iliopsoas abscess requires a multidisciplinary approach from orthopaedic surgeons, nursing staff, microbiologists, radiologists and physiotherapists. The use of empirical broad-spectrum antibiotics is essential to prevent further dissemination of the infection. This would need to be adjusted according to the pathogen and sensitivities obtained through culture of samples. These should be continued for at least two weeks after drainage. Drainage of the abscess is the ultimate treatment for these cases. It can be done surgically through incision and drainage or CT-guided percutaneous drainage (PCD). The latter is the gold standard especially in primary abscess as it is less invasive (Dinc et al., 1996). However, surgical drainage can be used if there is any contraindication to PCD or an abdominal pathology is present which also requires intervention. Thus, surgical intervention is more commonly used in secondary abscess formation (Procaccino et al., 1991).

### **Complications**

If not treated iliopsoas abscess can lead to sepsis, disseminated intravascular coagulation

and death. It can also lead to long term disability including femoral nerve damage, hydro nephrosis secondary to compression on the ureters, deep vein thrombosis affecting mainly the iliac veins (Simms et al., 1998) and

septic arthritis with hip joint damage as the infection tracks down along the iliopsoas bursa which connects with the hip joint in 15% of cases (Arai et al., 1999).

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