

Paediatric iliopsoas abscess: a case report

Abstract

Introduction: Iliopsoas abscess is an uncommon condition in the paediatric population. The clinical presentation is variable and may be confused with other conditions such as septic arthritis, osteomyelitis and appendicular abscess. A suspicion of iliopsoas abscess requires a prompt diagnosis so that rapid management and treatment can be undertaken.

Discussion: This case describes the presence of an iliopsoas abscess in a paediatric patient presenting to the emergency department within a rural community. Due to the variability in clinical presentation imaging studies are necessary to distinguish an iliopsoas abscess from other inflammatory processes. Ultrasound is often the modality of choice. Imaging guided percutaneous drainage and/or aspiration and the administration of intravenous antibiotics are minimally invasive modern techniques providing a safe treatment options in the presence of an iliopsoas abscess.

Conclusion: Iliopsoas abscess is an uncommon condition in the paediatric population. Due to the variability in clinical presentation, imaging, and in particular, ultrasound play a vital role in the diagnosis of cases with a high suspicion of abscess formation. Accurate diagnosis leads to a rapid treatment plan, avoiding further insult.

Keywords: abscess, iliopsoas, paediatric, ultrasound.

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Figure 1: Transverse ultrasound of the left iliac fossa demonstrating a large heterogeneous mass.

Case

A four-year-old male presented to the emergency department at a regional hospital with a left leg limp. Pelvic and left knee x-rays were ordered but were reported as unremarkable. Laboratory investigations revealed an elevated white cell count (WCC) of $24.50 \times 10^9/L$, platelet count of

605 and neutrophils of 21.51. The neutrophils demonstrated toxic changes and reactive film changes suggestive of an inflammatory or infective process. Blood cultures were taken but demonstrated a negative screen. The patient was admitted to the paediatric ward for intravenous (IV) antibiotics.

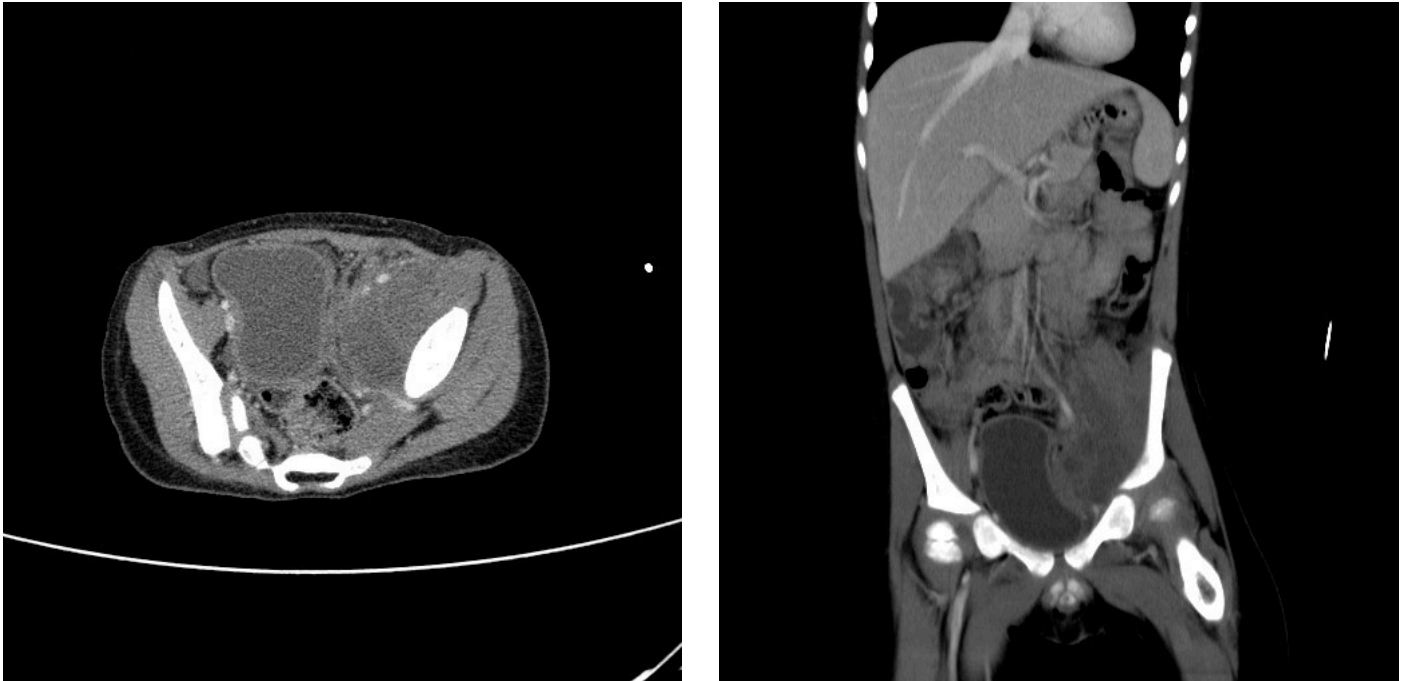


Figure 2: Axial (a) and coronal (b) CT scan demonstrating the large fluid collection within the left iliopsoas muscle measuring 47 x 31 x 31 mm and causing anterior displacement of the external iliac vessels. Collection has a thin rim of contrast enhancement.

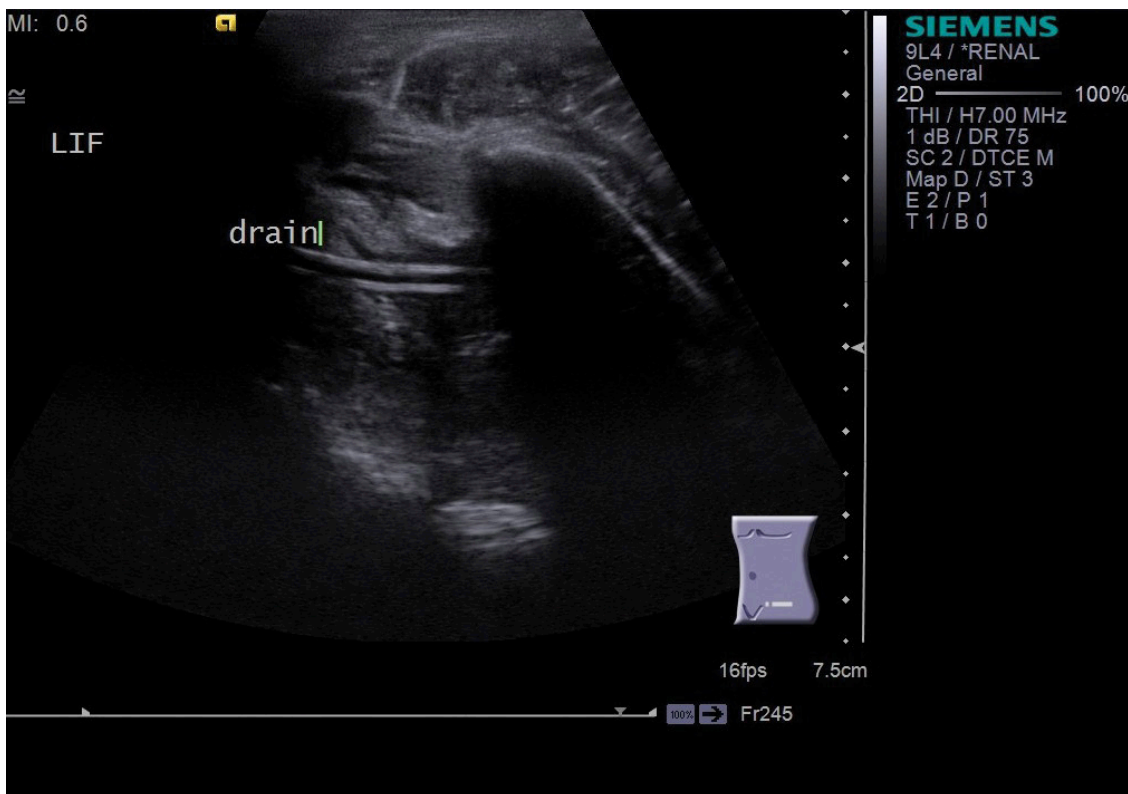


Figure 3: Post drainage ultrasound showing drain in-situ. Small ill-defined echogenic area corresponds to residual iliopsoas abscess.

Two days post admission an ultrasound was requested to investigate the possibility of septic arthritis of the left hip and/or knee joints. The patient presented to the radiology department with a carer and the attending medical physician. The examination was limited due to patient's intellectual disability, which was made known at the time of examination, and the patient's physical discomfort. Ultrasound imaging of the left knee demonstrated normal cartilaginous anatomy and

no joint effusion. Ultrasound of the left hip confirmed the absence of a joint effusion, revealing instead a large ipsi-lateral heterogeneous collection within the left iliac fossa (Figure 1). The urinary bladder was displaced to the right side as a result of the collection within the left iliac fossa. This raised the possibility of an iliopsoas abscess or haematoma.

As a result of the likely diagnosis, the patient was transferred to the state's tertiary children's hospital for further investigation.

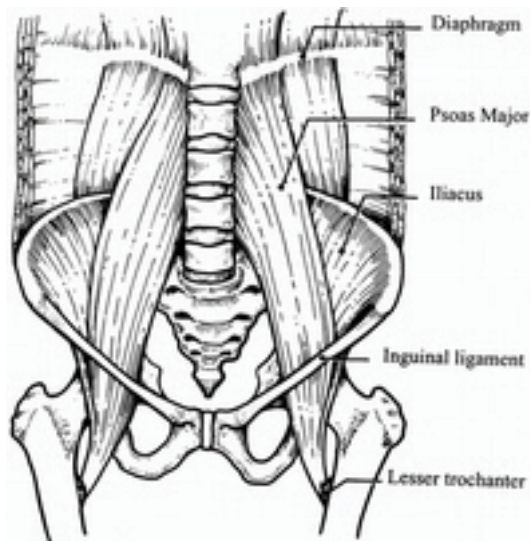


Figure 4: Normal iliopsoas compartment anatomy.

At the children's hospital the patient underwent a CT scan of the abdomen and pelvis. This demonstrated a large (47 x 31mm) enhancing fluid filled collection within the left iliopsoas muscle causing anterior displacement of the external iliac vessels (Figure 2). The diagnosis of an iliopsoas abscess was confirmed.

As a result the patient underwent (under GA) an ultrasound-guided drainage of the iliopsoas abscess cavity. Using ultrasound guidance and sterile technique an 8F pigtail drainage catheter was sited within the abscess cavity. Approximately 8ml of green purulent material was aspirated. Post aspiration ultrasound appearances suggested near or complete emptying of the abscess cavity. A specimen from the aspiration was sent for MC&S. This demonstrated leucocytes, gram-positive cocci and an abundant growth of staphylococcus aureus.

A repeat ultrasound of the left iliac fossa was performed after three days. The pigtail drain was seen in-situ with the tip within the left iliac fossa. Within the iliac fossa there remained an ill defined, heterogeneous, predominantly echogenic collection in keeping with a residual psoas abscess (Figure 3). It was approximately 3.0cm in length. The abscess had reduced in size, and appeared to be more organised with no liquefied component within. A swab from the left hip drain was sent again for MC&S. This demonstrated scant staphylococcus aureus cultures.

The patient continued IV antibiotics and was discharged 8 days post admission.

Discussion

The iliopsoas compartment is an extra peritoneal space extending from the posterior mediastinum to the hip joint. It comprises the greater psoas, smaller psoas, and iliac muscles, which act as the primary flexors of the hip and trunk¹ (Figure 4). Pathologies that most commonly involve the iliopsoas compartment are inflammatory, haemorrhagic and neoplastic processes.¹ Iliopsoas abscesses were first described in 1881 and are defined as "a collection of pus in the iliopsoas compartment" (Mallick, *et al.* 2004).² It is a rare condition seen within the paediatric population, with the paucity of symptoms, late presentation and uncertain pathogenesis making it a challenging diagnosis to make.^{2,3}

The typical age of presentation in children is 5 to 9 years, with a higher prevalence occurring in males.^{3,4} Most commonly, the clinical symptoms include pain, impaired ambulation, non-weight bearing, localized swelling, limp, and fever.³⁻⁵ Pain, fever and limp are the classical triad of symptoms and is present in almost 100% of cases.³⁻⁶ Some patients may also experience associated abdominal, genitourinary or spinal complaints, and fixed flexion deformity of the affected side.^{4,5} Blood results, though generally non-specific, usually demonstrate anaemia, leucocytosis, elevated sedimentation rate, elevated C-reactive protein (CRP), with positive blood cultures occurring in about a third of all cases.^{4,5}

The pathogenetic mechanism for retroperitoneal abscesses varies between adults and the paediatric patients.³⁻⁵ Occurrence in children tends to be primary in nature rather, as opposed to secondary spread from contagious infectious processes seen in adults.³⁻⁵ Though the exact pathophysiology of primary psoas abscess is unknown, it has been suggested that the presence of a transient bacteraemia may be the cause, though primary muscle infection is a rare condition, even in children with septicaemia.³⁻⁵ Muscle tissue has an inherent resistance to bacterial infection so some form of previous trauma is more likely evident.³⁻⁵ Secondary psoas abscesses tend to occur as a result of haematogenous sources, skin penetration, previous viral illness, renal failure or diabetes, appendicitis, bowel disease or retroperitoneal lymphadenitis.⁴ Malnutrition has also been suggested as a possible contributing factor.⁴

Due to the variability in clinical presentation imaging studies are necessary to distinguish an iliopsoas abscess from other inflammatory processes.⁴⁻⁶ Plain x-ray is of limited value, demonstrating abnormalities only when there is extensive soft tissue oedema present or subluxation of the involved joint.⁴⁻⁶ Ultrasound, CT and MRI are reported as being the most clinically diagnostic tools.⁴⁻⁶ Ultrasound is often the modality of choice, due to its nature as a quick, cheap diagnostic tool that does not involve the use of radiation.⁴⁻⁶ Ultrasound is effective in demonstrating hip effusions in the case of arthritis, and distinguishing joint effusions with collections in the iliac fossae.⁴⁻⁷

CT may be useful in defining abscess margins, though it may not differentiate between an abscess and a haematoma.⁵⁻⁷ CT is useful for identifying joint effusions and initial or early stage pyomyositis.⁷ MRI is preferable after negative ultrasound and/or bone scan due to its greater resolution.⁷ MRI is ideal for evaluating soft tissues details, and for distinguishing coexisting arthritis and/or osteomyelitis in T2-weighted signal, for differentiating between invasive or purulent stages with gadolinium and delineating between involved muscle and oedema.⁷ However MRI is not always available and may require sedation in younger patients.⁷

Staphylococcus aureus is the most frequent isolated organism in iliopsoas abscesses, occurring in 85–90% of patients.^{2,4,5,8} *Staphylococcus hominis* and *Klebsiella pneumoniae* pathogens are responsible for the remaining cases.^{2,4,5,8} In immune-compromised patients other organisms have been described, including gram-negative enteric organisms, anaerobes and fungi, though these organisms are very rarely found in the paediatric population.^{2,4,5,8}

Conventional treatment options for iliopsoas abscesses in paediatric patients are via appropriate antibiotic administration.^{8,9} Open or percutaneous surgical draining is also

required in the majority of cases.^{8,9} Imaging guided percutaneous draining is often advocated; in particular the use of ultrasound guided drainages for a quick, minimally invasive and non-radiation treatment option.^{8,9} Antibiotic choice is guided by the knowledge of the causative organism present within the aspirated material.^{8,9,10}

Conclusion

Iliopsoas abscess is an uncommon condition in the paediatric population.² Due to the variability in clinical presentation, imaging, and in particular, ultrasound play a vital role in the diagnosis of cases with a high suspicion of abscess formation.³ Accurate diagnosis leads to a rapid treatment plan, avoiding further insult.⁵ Antibiotic and drainage are the preferred treatment options in paediatric patients diagnosed with an iliopsoas abscess, with the majority of patients achieving a full recovery.^{8,9}

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