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Iliopsoas Abscess Presenting With Sacral Fracture and Gluteal Abscess: A Clinical Conundrum

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Abstract

Abscess of the iliopsoas muscle is a rare condition that requires a high degree of clinical suspicion for diagnosis. High mortality rates highlight the need for prompt recognition. We report the case of a 26-year-old man, with a history of intravenous drug use, who was referred from an outside facility with sacral fracture and gluteal abscess. Sacral trauma occurred 3 weeks before presentation, with progressive worsening of buttock pain. The patient was treated with irrigation and débridement of the gluteal abscess. Follow-up MRI revealed a communicating iliopsoas abscess that initially had been undiagnosed. After a prolonged hospital stay requiring additional irrigation and débridement procedures, the patient was discharged in a stable condition. Five-month follow-up has demonstrated no evidence of recurrence of infection. To our knowledge, this is the first reported case of *Staphylococcus aureus* gluteal abscess with pelvic extension into the iliopsoas secondary to sacral trauma and intravenous drug use.

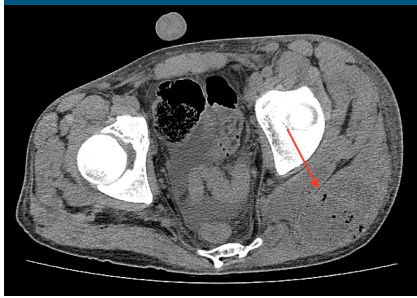
The anatomy of the psoas muscle lends itself to significant complications when infected. The psoas lies in the retroperitoneum, within the retrofascial space, bounded anteriorly by the transversalis fascia and posteriorly by the psoas fascia. The psoas muscle arises from the transverse processes of the twelfth thoracic to the fifth lumbar vertebrae. It joins the iliacus muscle arising from the iliac fossa, and both insert through a common tendon to the lesser trochanter of the femur. Considering the psoas muscle's proximity to the vertebrae, retroperitoneal structures, and the hip joint, direct spread of infection into these regions is possible. Less commonly, reports of

unusual spread to the buttock region have been described.^{1,2} The piriformis and obturator internus muscles have been implicated in gluteal spread from the pelvis, as they transverse the sciatic foramen.³ Infectious spread from the psoas, over the iliac wing, and into the buttock has also been reported.¹

Case Report

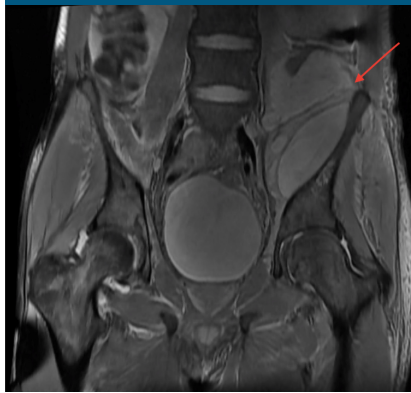
A 26-year-old man was referred to our orthopaedic service from an outside facility. An increased white blood cell count (WBC) had been noted, and CT was positive for left Denis zone 1 sacral fracture and right nondisplaced, anterior column

Figure 1



Preoperative transverse CT demonstrating gluteal abscess with air pocket formation.

Figure 2



Initial postoperative coronal MRI demonstrating multiloculated iliopsoas abscess.

acetabular fracture. In addition, there was concern for possible gluteal abscess. The patient had a self-reported history of recent intravenous (IV) drug use, corroborated by close family members. The patient received a new diagnosis of hepatitis C during his hospitalization, but he had no other medical conditions or comorbidities. The patient had been in a normal state of health until approximately 3 weeks earlier, when he fell off his bike while trying to descend a 14-foot staircase. The patient injured his left buttock, but he had recovered well enough within 30 minutes to ambulate. The patient indicated that pain became progressively worse the following weeks, leading to three separate emergency department visits. The third visit prompted CT with the aforementioned findings, which led to a referral to our orthopaedic service.

On admission to our facility, physical examination in the emergency department was significant for fluctuant mass and extreme tenderness to palpation over the left buttock and sacroiliac joint. The overlying skin was intact, with no erythema or warmth. The patient was afebrile with mild tachycardia. Laboratory test results revealed a C-reactive protein level of 304.0 mg/L, erythrocyte sedimentation rate of 38 mm/h, and white blood cell count of 22,200/mm³ with

82% neutrophils. Review of outside CT indicated gas within the gluteal abscess (Figure 1). A decision to proceed with aspiration to confirm suspicion of infected gluteal hematoma was made. Aspiration of the abscess revealed frank pus, with a WBC count of 390,000 leukocytes/mm³, which was sent for aerobic, anaerobic, and fungal culture. The patient was taken urgently to the operating room for extravasation of the abscess.

On hospital day 1, the patient underwent initial irrigation and débridement (I&D) plus wound culture analysis of the left gluteal muscles. An incision was made directly over the fluctuant mass. On reaching the gluteus maximus, approximately 300 mL of fluid was evacuated. A fluid pocket was palpated down to the left sacroiliac joint. A communication with the pelvis was not noted at this time. The wound was irrigated with povidone-iodine and normal saline and was packed with wet-to-dry dressings. Initial cultures of the purulent fluid grew methicillin-sensitive *Staphylococcus aureus*. Follow-up MRI performed on hospital day 3 demonstrated no residual left buttock soft-tissue fluid collection. However, MRI was notable for in-

trapelvic 16 × 9 × 7-cm multiseptate left iliac fossa and iliopsoas intramuscular fluid collection (Figure 2). The patient was taken back to the operating room for repeat I&D of nonviable gluteal tissue and drainage of the newly discovered pelvic abscess. This was achieved by making an incision along the left iliac crest and dissecting down along the inner table of the iliac muscle until a large abscess with copious purulent fluid was encountered. This fluid tracked along the iliacus to involve the common muscle belly of the iliopsoas. The fluid was cultured, after which the cavity was thoroughly irrigated with normal saline and pulse lavage. Both wounds were then packed with wet-to-dry dressing. Throughout his hospitalization, the patient underwent two additional I&D procedures. The final one, which occurred on hospital day 11, was indicated due to continued purulent drainage and need for evaluation of nonvital tissue. Blood cultures drawn on hospital days 5 and 6 demonstrated no growth. Tissue cultures taken from the final débridement revealed no bacteria. The gluteal wound received a wound VAC, whereas the iliopsoas wound was packed with wet-to-dry dressing. Both were left open to heal by secondary intention. Before discharge, MRI demonstrated complete evacuation of both gluteal and iliopsoas abscesses.

During his hospitalization, the patient received a new diagnosis of hepatitis C. Antibiotics received were initially vancomycin, levofloxacin, and metronidazole. On hospital day 3, on return of methicillin-sensitive *S aureus* aspirate and tissue culture, the patient was transitioned to cefazolin 2,000 mg IV every 8 hours. The patient was discharged with PICC and instructions to continue the regimen of cefazolin for at least 30 days, with wound VAC and wound care. The patient also began outpatient treatment for opioid

addiction. Three-view pelvic radiographic series 3 months post-operatively were significant only for a subtle lucency of the left sacral ala corresponding to previous fractures. No radiographic signs of osteomyelitis or recurrent infection were noted. The sacral fracture was managed non-surgically because of minimal displacement and a high risk of persistent infection if the device had been placed on the infected tissue bed. The pelvic ring was considered stable per CT findings of bilaterally intact inferior and superior pubic rami, with no widening of the pubic symphysis or sacroiliac joints.

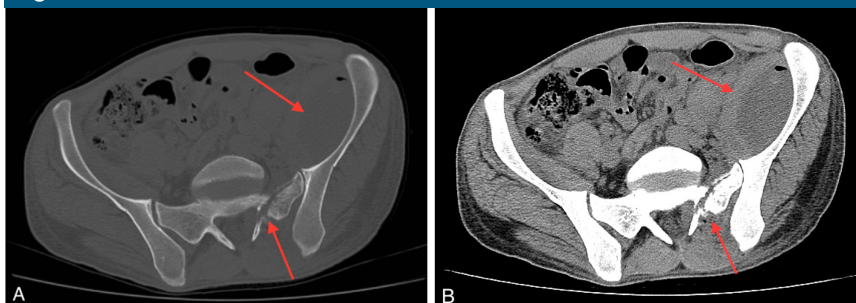
At 5-month follow-up, the patient demonstrated no clinical signs of recurrent infection, surgical scars were well healed, and the patient was ambulating normally with full function. Laboratory tests taken at this time demonstrated a white blood cell count, C-reactive protein level, and erythrocyte sedimentation rate all well below patient baselines established before hospital discharge.

Discussion

Psoas abscess is a rare clinical finding, especially in developed nations.⁴ The incidence is unknown, but it has likely increased in the past decade, in part because of rising IV drug use rates.⁵ Symptoms are often non-specific; the patient may complain of low back, buttock, hip, or thigh pain. A patient will often present with a flexed hip and a limited active and passive range of motion, suggesting an intra-articular hip pathology rather than a pelvic source.² Yet the high mortality and morbidity rates highlight the importance of prompt diagnosis and initiation of treatment.

The iliopsoas muscle has a rich vascular supply and proximity to retroperitoneal lymphatic channels, which contribute to its susceptibility to seed-

Figure 3



Preoperative transverse CT demonstrating Denis zone 1 sacral fracture, sacral bone attenuation consistent with osteomyelitis, and pelvic infection within the iliac fossa as viewed in bony (A) and soft-tissue (B) windows.

ing and infection. IV drug use is known to predispose to hematogenous seeding of the iliopsoas, with *S aureus* accounting for approximately 88% of primary psoas abscess cases.⁶ Primary psoas abscesses typically result from hematogenous seeding of *S aureus* and are associated with IV drug use. Secondary psoas abscesses typically result from direct extension of enteric microbes and are associated with inflammatory bowel syndromes or urological infections.⁷ Mortality in primary and secondary psoas abscesses is 2.4% and 19%, respectively. Untreated psoas abscess mortality rates may approach 100%.⁸

Our case highlights both IV drug use and recent trauma as contributing to the development of communicating gluteal and iliopsoas abscesses. In our patient, the gluteal hematoma likely acted as nidus for infection that spread to the pelvis to involve the iliopsoas. MRI and intraoperative findings demonstrated abscess tracking from the sacral fracture to the iliac fossa, along the iliacus, and into the iliopsoas, suggesting secondary iliopsoas abscesses. *S aureus* inoculated from an IV source was almost certainly precipitated by illicit drug injection.

There are very few cases of psoas abscess in the literature with extrapelvic extension.^{1,2,9,10} To our knowledge, this is the first reported case of a secondary iliopsoas abscess

with associated gluteal abscess triggered by trauma and IV drug use. With epidemic increases in IV drug use recently, soft-tissue infections are likely to increase. This case also reinforces the need to examine all aspects of radiographic imaging rather than focusing attention only on bony pathology. Review of initial CT imaging indicates that the iliopsoas abscess was visible at the first presentation (Figure 3). The focus on the sacral fracture, osteomyelitis, and use of a bone window setting may have distracted from the iliopsoas abscess. A cursory review of the soft-tissue window would have resulted in swifter recognition of the iliopsoas abscess, as it was readily visible in this view. In clinical medicine, there are often multiple pathologies contributing to a single presentation. Identifying a bony pathology that explains a complaint, in this case gluteal pain, does not rule out other possible contributing causes. A broad differential must be maintained and systematically ruled in or out to achieve best possible patient outcomes.

Conclusion

The authors have presented a rare case of secondary iliopsoas abscess, with the presentation of gluteal abscess, that

was successfully débrided after going unrecognized with initial imaging studies. Given the high morbidity and mortality rates of untreated iliopsoas abscess, a gluteal abscess with a history of trauma and IV drug use necessitates a high degree of suspicion and a very careful evaluation for pelvic extension of infection.

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