Psoas Abscess: A Diagnostic Dilemma

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Iliopsoas muscles are located in the retrofascial space, which lies between the transversalis fascia and the posterior psoas fascia.[1] Abscesses of the iliopsoas result most commonly from osseous sources, such as the spine, ileum, and sacroiliac joint. They seldom arise from pyomyositis, trauma, lymphatic spread, or puerperal infections. Immunocompromised patients and drug users are particularly susceptible.

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Iliopsoas abscess may initially present with signs and symptoms in the buttock, hip, or thigh. Such signs and symptoms may be obscure, nonspecific, and misleading.[1] Diagnosis is often overlooked, as a patient lies supine and refuses to move or resists being turned for examination. With psoas involvement, the hip is flexed and has a limited and painful range of motion that diverts attention from the abdominal or pelvic source of the abscess.[2] Pain is referred along the distribution of the gluteal or obturator nerves or along the distribution of the lumbar and sacral nerve roots, thus directing attention elsewhere.[2] The abscess may also be overlooked given the deep location of the iliopsoas muscle.[3] Iliopsoas abscess is best detected through use of computed tomography (CT), which defines its pathway and allows for appropriate surgical treatment.

Methods and Results

Case 1

A 30-year-old man was admitted after being an inpatient at an outlying facility for several weeks. Hospitalization was for left hip pain caused when the man was struck by a board in the left groin area 3 months earlier. There was a question of pelvic fracture. On admission, pelvic CT showed large psoas and iliacus muscles extending into the pelvis (Figure 1). CT with contrast injection revealed cystic changes in the acetabulum superiorly. X-rays revealed severe joint space narrowing superiorly.

On admission, the patient was taken to the operating room, where he underwent excisional débridement of a left psoas abscess of the left hip with excisional débridement of the femoral head (Girdlestone procedure). After 9 days, a pelvic CT scan revealed shrinkage of the psoas. There was also no intraperitoneal, bladder, or prostate involvement. Throughout his hospitalization, the patient received 4 more irrigations and excisional débridement operations on the left hip and psoas wounds. After 17 days, there was no apparent loculated abscess. The left psoas muscle appeared somewhat larger, as did the left gluteal muscles.

The patient was discharged with the left leg non–weight-bearing. He was given ampicillin/sulbactam and levofloxacin during the course of his stay. There was no recurrence, and all wounds were healed by secondary wound repair at time of last follow-up (6 months).

Case 2

A woman in her late 20s with psoas infection was transferred from an outlying facility. Seven months before admission, she had a laparoscopic cholecystectomy. After CT-guided drainage, which grew methicillin-resistant *Staphylococcus aureus,* her pain continued. CT scan revealed a large abscess extending to the pelvis, with erosive changes to the ilium and sacroiliac joint. A large flank abscess was seen extending around the iliac wing, mostly subcutaneous and involving the iliopsoas and gluteal muscles (Figure 2).

The patient underwent a 2-incision approach for drainage of the abscess and débridement of destroyed iliac bone. The next day, an abdomen and pelvic CT scan with contrast showed no residual fluid collection. During her hospitalization, the patient had 2 additional irrigation and débridement operations.

The patient was discharged on linezolid with dressing changes and weight-bearing as tolerated. Wounds healed by secondary closure, with no complaints at last follow-up (11 months).

Case 3

A man in his late 30s with increasing hip pain was transferred from an outlying facility. He had cardiac catheterization 3 months earlier and shortly after was hospitalized for a few days with right groin pain. At that time, CT scan

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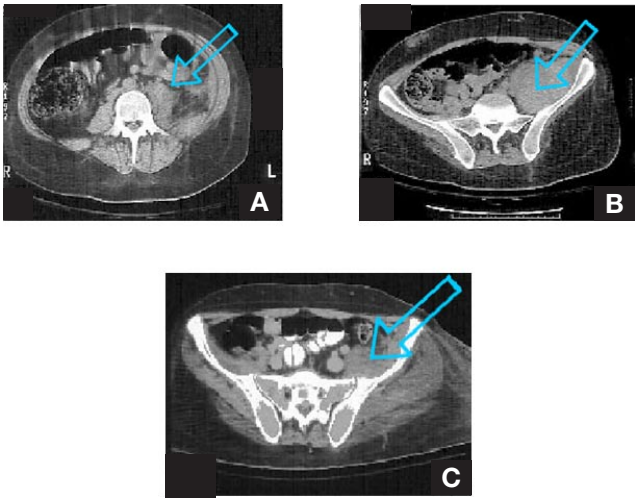

Figure 1. In case 1, computed tomography (CT) scans obtained on admission revealed **(A)** large inflamed psoas muscle extending into pelvis and **(B)** very large inflamed iliacus muscle extending into pelvis. **(C)** CT scan obtained 17 days later revealed no obvious loculated fluid collection. Left psoas and gluteal muscles appeared somewhat larger.

of the abdomen and pelvis with contrast revealed no retroperitoneal or intramuscular hematoma. The patient had previously had lumbar spine laminectomy with hardware fusion as well. Duration of the left hip pain was approximately 2.5 months. The patient could not bear weight on the left leg because of severe pain. CT scans from an outside facility on admission indicated enlargement of the iliopsoas muscles as well as soft-tissue enlargement extending to the hip and proximal femur (Figure 3).

During hospitalization, the patient was taken to the operating room, where he underwent excisional débridement of the left psoas as well as left hip arthrotomy with excisional débridement. Cultures revealed left hip osteomyelitis with methicillin-sensitive *S aureus*. Five days later, he underwent irrigation and excisional débridement of the femoral head (Girdlestone procedure) with insertion of antibiotic-loaded cement spacer and closure of the hip wound over drains with packing of the iliac wound. CT scan 10 days after initial drainage and 5 days after excisional débridement of the femoral head showed a large iliopsoas muscle. Two additional irrigation and débridement operations of the left iliac wound were performed during hospitalization.

The patient was discharged on cefotaxime, weight-bearing as tolerated, and wound vacuum-assisted closure. He underwent total hip arthroplasty and had no complications at time of last follow-up (29 months).

Discussion

The iliopsoas muscle complex extends from the edges of the 12th thoracic vertebra to the 5th lumbar vertebra and the lesser trochanter of the femur and is a direct posterior relation of many of the abdominal and retroperitoneal viscera.[4] The psoas muscle has a rich vascular supply that

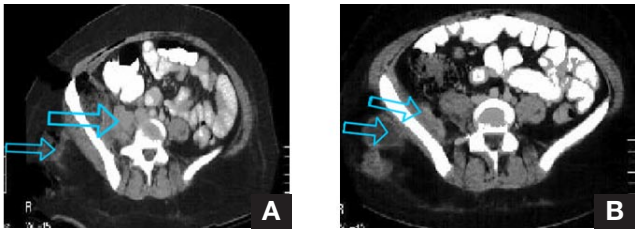

Figure 2. In case 2, **(A)** computed tomography (CT) scan obtained on admission showed large flank abscess extending around iliac wing, mostly subcutaneous and involving the gluteal muscles. **(B)** CT scan obtained 1 day after débridement revealed no residual fluid collection.

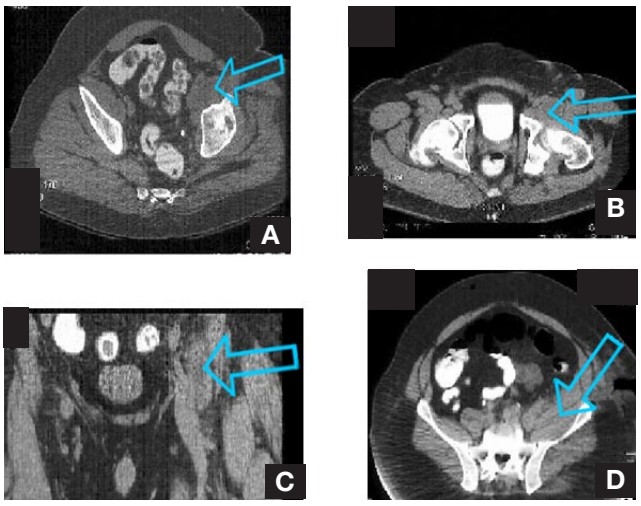

Figure 3. In case 3, **(A)** computed tomography (CT) scan obtained on admission showed enlarged inflamed iliopsoas muscles. **(B)** Coronal CT scan obtained on admission showed soft-tissue enlargement of the iliopsoas extending to the hip and proximal femur. **(C)** CT scan obtained on admission revealed enlarged inflamed iliopsoas muscle. **(D)** CT scan obtained 10 days after initial drainage (5 days after excisional débridement of femoral head) showed large iliopsoas muscle.

is believed to predispose it to hematogenous spread from sites of occult infection. In 70% of people, it is a single structure (psoas major), but 30% also have a psoas minor muscle, which lies anterior to the psoas major along the same course.[5]

Symptoms are often nonspecific. Patients may present with fever, flank pain, abdominal pain, or limp. Other symptoms are nausea, malaise, and weight loss.[5] Because psoas abscesses are difficult to diagnose, a through medical history of the patient and a good physical examination are critical for prompt diagnosis of psoas abscess. Abscess formation promptly requires surgical drainage before antibiotic therapy.[3] For orthopedic surgeons, iliac-crest apophyseal-splitting incision is an easy, direct, and familiar procedure. This approach allows excellent drainage of psoas and iliacus abscesses and drainage of ilium, sacrum, and sacroiliac joint.

Drainage of the abscess is not sufficient, and radi-

The Role of Imaging in Diagnosis and Treatment

CT is the method of choice for abscess detection, though ultrasonography and magnetic resonance imaging are also useful. Ultrasonography is diagnostic in only 60% of cases of psoas abscess, compared with 80% to 100% for CT.[6,7] Ultrasonography is influenced by body habitus and gaseous bowel distension and is operator-dependent. Magnetic resonance imaging, radionuclide imaging, and positron emission tomographic imaging have all been used in evaluating psoas abscess, though the negative cost implications and lack of ready availability make it difficult to identify any advantage over CT scanning.[4]

Both CT and ultrasonography allow for guided percutaneous needle aspiration and drainage.[8] CT defines the extrapelvic pathway of spread and allows for appropriate surgical excision drainage at the gluteal area and/or about the proximal femur and hip joint.[1]

The most common CT feature of an abscess is usually a focal hypodense lesion within a larger muscle.[9] Lenchik and colleagues[10] reported low attenuation in 100% of their abscesses, but this sign also can be seen in neoplasms and hematomas. Margination of the abscesses can be variable. Rounded, smooth collections conforming to the configuration of the involved muscles with enhancement of the rim of the abscess wall—the so called rind sign—can be present.[4,11] Less frequently, infiltration of the surrounding fat and irregular margins of the lesion are found. When CT findings are assessed, the clinical setting can differentiate inflammatory, neoplastic, and hemorrhagic conditions of the iliopsoas muscle.[9] Presence of gas bubbles or air–fluid level is regarded as more specific for an abscess, though gas has been reported in neoplasms.[12] Multiloculated lesions can also be found.

cal excision of all necrotic tissue should be performed. Eradication of the bone and soft-tissue infection requires several operations. Postoperative antibiotics are obligatory and are adapted individually. Most patients experience full recovery with no continuing sequelae.[3] However, there is the possibility of residual effects, such as osteomyelitis of adjacent bones, scarring of muscle, weakness, functional impairment, and a depression at the infection site.[3]

Summary of the 3 Cases

All 3 of the patients described here were referred to us from outside institutions. In each case, pretreatment CT scans revealed substantial abscess collection formations. Three months earlier, 1 patient underwent heart catheterization through the groin, with concern shortly thereafter of retroperitoneal or intramuscular hematoma. At the time, this was investigated with CT scan and was shown to be negative. This patient also had previous lumbar spine laminectomy with hardware fusion. A different patient underwent laparoscopic cholecystectomy 7 months earlier, and the third had recent trauma about the groin, with questionable pelvic fracture.

All 3 patients had a 2-incision excisional drainage approach (1 iliac-crest apophyseal-splitting incision, 1 gluteal/hip incision). In 2 patients, excisional débridement of the femoral head was necessary. One patient had previous CT-guided abscess drainage that failed to control the problem.

Conclusions

Although iliopsoas abscess presents unclear signs and symptoms, often in the lower extremities, CT can aid in evaluating and diagnosing the abscess. Once the abscess is detected, successful treatment should include surgical drainage as well as excision of all existing necrotic tissue. Determinants of success include early diagnosis, complete drainage, and proper antibiotic use.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

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