CASE REPORT CRSLS

Laparoscopic Drainage of Iliopsoas Abscess

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ABSTRACT

Introduction: Iliopsoas abscess is a rare condition that carries a risk of mortality when not treated appropriately. There is a paucity of high-level evidence concerning the management of this abscess and very sparse data is available in the literature regarding treatment options. This article discusses the treatments for iliopsoas abscess and reports a case effectively drained laparoscopically through an extraperitoneal approach.

Case Description: We present a case report of primary iliopsoas abscess.

Discussion: Computed tomography (CT) is the best imaging modality for visualizing iliopsoas abscess, and retroperitoneal laparoscopic drainage is an ideal approach for treatment of primary abscesses. Management options include antibiotics, percutaneous aspiration, percutaneous drainage, and laparoscopic or open surgical drainage. A laparoscopic extraperitoneal approach is an effective treatment option, as it allows more complete drainage compared with washout of the abscess cavity, reduced postoperative pain, and a shorter hospital stay.

Key Words: Iliopsoas abscess, Percutaneous abscess drainage, Retroperitoneoscopic drainage, Extra peritoneal, Primary abscesses.

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INTRODUCTION

Iliopsoas abscess is a condition rarely encountered in the modern age. The iliopsoas anatomic area is located in the abdominal retroperitoneal space, and the iliopsoas compartment is seldom affected by pathologic processes. There are two mechanisms that can lead to the formation of iliopsoas abscess: contiguous spread from infected organs or hematogenous spread from sites of occult infection. Abscesses caused by hematogenous dissemination of bacteria are defined as primary abscesses. In secondary abscesses, infection is spread by direct contact with an infectious focus frequently involving the kidney, spine, or gut. Traditionally, these abscesses have been drained in an open extraperitoneal operative procedure. More recently, radiology-guided percutaneous drainage has become more common. We report a case of an 84-year-old woman with a right iliopsoas abscess that was drained laparoscopically through an extraperitoneal approach. To our knowledge, there are only a small number of reported cases of retroperitoneoscopic drainage of psoas abscess to date.

CASE REPORT

An 84-year-old woman was admitted to our hospital by the geriatric team in April 2013 with a 2-week history of gradually increasing right hip pain. The pain was absent at rest but occurred when the patient walked and especially during hip flexion. There was associated intermittent fever and confusion. The patient's daughter was concerned about the sudden deterioration in her mother's mobility, as the patient had been healthy and living independently in the community and playing tennis and golf weekly before the onset of the pain. She was not on an anticoagulant, had not had recent surgery, and had no recent history of falling.

Her medical history included hypertension, hypercholesterolemia, osteoarthritis, right mastectomy for breast cancer 10 years ago, bowel resection for colorectal cancer

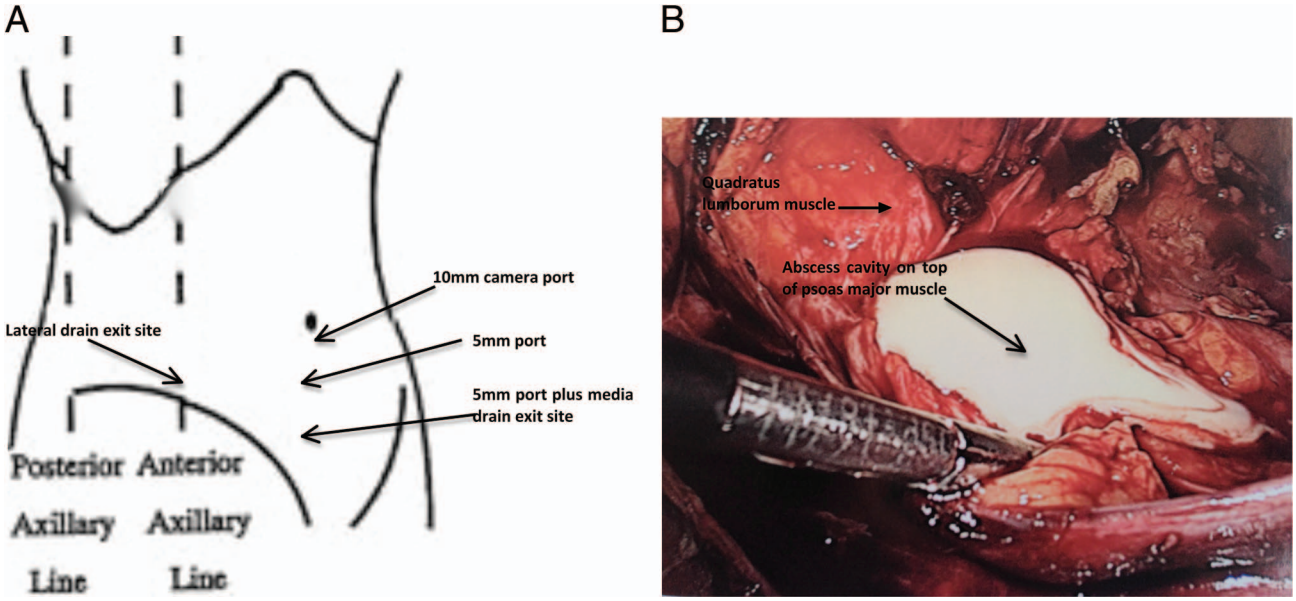

Figure 1. A, Iliopsoas abscess cavity. **B,** Intraoperative position of the patient, outlining laparoscopic port and drain exit sites.

with no further treatment 15 years ago, and appendiceal abscess treated with appendicectomy and antibiotics 6 years ago. A CT of the abdomen and pelvis (noncontrast) ordered by her general practitioner showed a right psoas mass that was thought to be a hematoma.

The patient was referred to the surgical team for further management of psoas hematoma or abscess. After consultation with infectious diseases physicians, she was given a broad-spectrum intravenous antibiotic (piperacillin-tazobactam). A CT scan with percutaneous drainage was performed that confirmed the diagnosis of an abscess, and the specimen later grew *Staphylococcus aureus*. The following day, her condition further deteriorated, with acute worsening of renal function and hypotension. At this point, a further CT scan was performed that showed right ureteral compression by the psoas abscess that was thought to be contributing to her worsening renal function.

Because of the deteriorating clinical picture, operative intervention was indicated. The patient underwent general anesthesia with appropriate antibiotic coverage, and a right ureteral stent was placed. The patient was then placed in a right semilateral position. A transverse subumbilical incision was made, and the rectus was retracted laterally. A balloon trocar was inserted and inflated to create an extraperitoneal space. Inflation to 15 mm Hg with CO_2 gas began. A 30-degree laparoscope was used for visualization. Two 5-mm ports were placed under vision in the midline into the extraperitoneal space. No other ports were placed besides these 3 (**Figure 1A**).

Dissection began laterally in the extraperitoneal space, similar to the dissection for total extraperitoneal inguinal hernia repair, but in the semilateral position. The right psoas muscle was identified and followed inferiorly until the abscess was identified. The abscess cavity was opened, and pus was drained and sent for gram staining and culture sensitivity (**Figure 1B**). The loculations within the abscess cavity were broken down and the area washed out with normal saline. Two 10-French Blake drains were placed: one inside the abscess cavity, and the second into the extraperitoneal space. Laparoscopic ports were withdrawn under vision. Rectus sheath defect and skin incisions were closed. The entire procedure took less than 30 minutes.

The patient made good recovery after the procedure, with resolution of sepsis and normalization of renal function. The culture grew drug-sensitive *Escherichia coli* and a coagulase negative *Staphylococcus* species. The extraperitoneal drain was removed on postoperative day 3, followed by removal of the drain from the abscess cavity on postoperative day 6. The ureteral stent was removed 6 weeks after the procedure. A surveillance CT scan performed 2 weeks after the procedure showed a pelvic hematoma that was treated conservatively. The patient was discharged home on long-term oral antibiotics, as per

infectious disease consultation, after spending 2.5 weeks in the hospital.

The patient had a follow-up CT scan performed 5 weeks after surgery that showed a reduction in the size of the pelvic hematoma and near complete resolution of the right kidney hydronephrosis. At 4 months after surgery the patient was back to her normal lifestyle and was discharged back to her general practitioner.

The etiology of the abscess remains unclear, as the patient gave no history of trauma, was not on any anticoagulant medication, and had a normal spine and unremarkable adjacent bowel loops on CT scan. The only possible contributor to the infection was material leftover from a prior appendiceal abscess drainage.

DISCUSSION

The psoas muscle is a retroperitoneal organ originating at a single continuous attachment from the lower border of the T12 vertebrae to the upper border of L5, with insertion on the lesser trochanter of the femur. In 70% of people, it is a single structure (psoas major), but 30% also have a smaller muscle, the psoas minor, that lies anterior to the psoas major along the same course. It is innervated by the first 3 lumbar nerves and acts as a lateral flexor of the vertebral column.[3] The psoas muscle lies near many other organs, including the sigmoid colon, jejunum, appendix, ureters, aorta, renal pelvis, pancreas, iliac lymph nodes, and spine. Thus, infections in those organs can contiguously spread to the psoas muscle. The psoas muscle has a rich vascular supply that is believed to predispose it to hematogenous spread from sites of occult infection.

An iliopsoas abscess is defined as a retroperitoneal collection involving the iliopsoas muscle. Limited data are available on the true incidence of iliopsoas abscesses. Historically, tuberculosis was the most common cause in the developed world. However, almost three-quarters of abscesses today are spread hematogenously. Diabetes mellitus and muscle trauma, even minor, are considered to be predisposing factors. The two mechanisms that lead to the formation of an abscess are contiguous spread from infected organs (secondary abscesses) or hematogenous spread from sites of occult infection (primary abscesses).

Primary abscesses are more common in children. In Asia and Africa, 99.5% of all psoas abscesses are primary, compared with 61% in the United States and Canada and 18.7% in Europe.[4,5] Most are unilateral. *S. aureus* is the cause in 80% of the cases, with other pathogens including *Serratia marcescens*, *Pseudomonas aeruginosa*, *Haemophilus aphrophilus*, and *Proteus mirabilis*.

Secondary iliopsoas abscesses are the result of gastrointestinal inflammatory diseases, with appendicitis, Crohn's disease, diverticulitis, and colon carcinoma the most common causes. These abscesses are usually caused by the enteric bacteria *E. coli*, *Streptococcus* species, *Enterobacter* species, and *Salmonella enteritidis*. Most abscesses are located in the right psoas area. There is no age group predominance, and the abscesses are more common in European and North American countries. Imaging studies can aid diagnosis and differentiate between primary and secondary types.

Iliopsoas abscesses are an uncommon occurrence, and there is a wide spectrum of etiology, time of diagnosis, and therapeutic approach. The clinical signs and symptoms are often atypical. The classic symptoms of flank pain, fever, and limping may be absent, leading to a delay in diagnosis and institution of treatment, which can result in an increase in morbidity and mortality. Routine laboratory tests are seldom useful for localizing the disease process; anemia, leukocytosis, and laboratory-detected sepsis are the most common findings. Iliopsoas abscess is commonly diagnosed on CT, magnetic resonance imaging or ultrasonography. CT remains the gold standard, with a reported sensitivity of 100%, specificity of 77%, and accuracy of 88%. Scan findings include asymmetrical enlargement of the muscle belly with a focal area of low CT attenuation or gas.[6]

Despite the development of new surgical techniques, the optimal management of iliopsoas abscess is not well established.[7] Traditionally, treatment has consisted of broad-spectrum antibiotics combined with percutaneous or open drainage of the contents. Percutaneous drainage was first described in 1984,[6] and case series have reported a success rate of 70% to 90%.[8,9]

The limitation of percutaneous drainage is incomplete drainage of the abscess cavity, especially in a multiloculated abscess. Therefore, percutaneous drainage guidance has been suggested as the first-line treatment, with open surgery being reserved for complex, multiloculated abscesses or after failure of the percutaneous technique. However, surgery has been recommended as the first-line treatment in secondary abscesses when the gastrointestinal tract is confirmed as the source of sepsis, as it allows definitive management of the pathologic bowel as well as full debridement of infected tissue.[10] The standard surgical technique involves an open approach incorporating a right iliac fossa incision and a muscle-splitting dissection,

continued posteriorly in the extraperitoneal plane until the psoas muscle is exposed.[10] There are other approaches, including groin, thigh, and lumbar incisions, but these approaches have been associated with unacceptable failure rates.[10]

Laparoscopic drainage has advantages over open surgery, including potentially better visualization of the area, more complete drainage, reduced postoperative pain, and shorter hospital stay. To our knowledge, only three publications regarding laparoscopic drainage of psoas abscess have been reported in the English literature.[10,11,12]

CONCLUSION

Psoas abscess is a rare cause of sepsis. CT scanning is the best imaging modality. Retroperitoneal laparoscopic drainage is an ideal approach for primary iliopsoas abscesses, as the dissection remains extraperitoneal, avoids breaching the peritoneum, and permits breakdown of all loculi, allowing full drainage and washout of the abscess cavity.[10]

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