

A REVIEW OF PSOAS ABSCESS

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Psoas abscess is an uncommon clinical entity that can be primary, following haematogenous dissemination of an aetiological agent, the source of which is usually occult, or secondary, as a result of local extension of an infectious process near the psoas muscle. The triad of presentation; fever, loin pain and limitation of hip movement may not be found in all patients. The correct diagnosis can be made with a vigilant clinical examination, epidemiological, microbiological and radiological investigations. The main stay of treatment is medical and or surgical drainage of abscess and treatment of the underlying illness. With the resurgence of tuberculosis, consequent upon the HIV/AIDS pandemic, there has been an increase in the number of psoas abscess due to mycobacterial organisms. This is a review of the literature on psoas abscess with highlights on the mode of presentation, diagnosis and treatment modalities.

Key words: psoas, abscess, review

INTRODUCTION

Psoas abscess arises mostly from spread of infections from surrounding anatomical structures. Diseases of the gastro-intestinal system are the most common causative factors, although haematogenous spread in the immunocompromised patients also account for some cases (1-3). Psoas abscess is relatively uncommon with a reported incidence of 0.4/100,000

per year in the United Kingdom (2), but with a mortality rate of 18-25% (1-3). Any age group may be affected, as some cases have been reported in the neonates (4), but general review showed the preponderance in the older age group in whom predisposing factors and the source of infection are more prevalent (1-3, 5).

Psoas abscess was virtually synonymous with tuberculosis of the spine or sacroiliac joint before

the introduction of streptomycin for the treatment of tuberculosis. In India and Africa where TB is endemic (6), 5% of patients with spinal tuberculosis (Potts disease) develop a psoas abscess (7). In the period between 1950 and 1985 when tuberculosis was largely mastered in the Western World (8), a tuberculosis abscess tracking down the psoas sheath was a rarity. However with the resurgence of TB, consequent upon the HIV/AIDS pandemic, tuberculous psoas abscess has once again become a focus of attention (9,10,11).

This article reviewed the literature on psoas abscess and discussed the technological milestones in the clinical and radiological diagnosis, and treatment of this condition.

SURGICAL ANATOMY OF PSOAS MUSCLE

The psoas muscle consists of the psoas major and minor. The psoas major is a long muscle on either side of the lumbar vertebra column and the pelvic brim (12). It arises from the anterior surfaces and lower borders of the transverse process of all five lumbar vertebrae, five interdigitation each from bodies of two adjoining vertebrae and

intervertebra disc and bodies of five lumbar vertebrae between the digitations. It descends along the pelvic brim posterior to the inguinal ligament but anterior to the capsule of the hip joint. It converges into a tendon and receives the fibres of the iliacus muscle and attached to the lesser trochanter of femur. A large subtendinous bursa, which occasionally communicates with the cavity of the hip joint, separates it from the capsule of the hip joint in 15% of the population. In the abdomen, the muscle is related to the peritoneum, kidneys and ureters. On the right, it is related to the inferior venacava and the ileocaecal junction. On the left, it is related to the colon. In the groin, it is related behind to the hip joint capsule and laterally to the femoral nerve. The psoas major acts together with the iliacus to flex the thigh upon the pelvis. When there is fracture of the neck of femur, it acts as a lateral rotator of the femur. The psoas minor lies anterior to the psoas major, entirely within the abdomen. It originates from the intervertebra disc between T12 and L1 and is attached to the pecten pubis and iliopectineal eminence. It is absent in 40% of the population

and acts as a weak flexor of the trunk (12).

An abscess may destroy part of the psoas muscle but is likely to be confined within the psoas fascia. The fascia is attached medially to the spine above and to the brim of the pelvis below. Laterally it blends with the fascia covering quadratum lumborum and the iliacus; a psoas abscess can extend further laterally than the outer border of the muscle. In the groin, the iliopsoas fascia is attached to the inguinal ligament and the iliopectineal eminence; the femoral vessels are medial to this deep attachment.

AETIOPATHOGENESIS OF PSOAS ABSCESS

Psoas abscess is of two varieties. The primary type is caused by haematogenous dissemination of bacteria or spread through lymphatics, the source of which is usually occult. This type is seen in about 30% of cases and especially in immunocompromised patients such as diabetics and alcoholics (13, 14). The commonest organism implicated in this type of psoas abscess is *Staphylococcus aureus* (15,16,17), though other types of organism have been isolated (14,18).

Secondary type occurs as a result of local extension of infective process and is responsible for about 70% of psoas abscess. Intra-peritoneal inflammatory processes and spinal pathology are the two most important conditions leading to psoas abscess formation. The intraperitoneal lesions include diverticulitis of the colon, appendicitis, pancreatitis and Crohn's disease (19,20,21). Several reports have shown Crohn's disease to be the single most common bowel lesion associated with psoas abscess (21-25). Other bowel lesions include carcinoma and actinomycosis of the colon. Microorganisms recovered from the inflammatory processes causing secondary psoas abscess are varied and include aerobic and anaerobic enteric gram-negative bacilli such as *Escherichia coli*, *Proteus vulgaris*, *Klebsiella pneumoniae* and other organisms such as *Clostridium difficile*, Diphtheroid bacilli and *Bacillus spp* (21,26). Tuberculosis of the spine and sacroiliac joint is another major cause of secondary psoas abscess usually following rupture of thoracolumbar abscess (11). Pyogenic osteomyelitis, sacroilitis and

spondylitis are other spinal inflammatory lesions leading to secondary psoas abscess. Other rarer lesions associated with secondary psoas abscess include renal calculus (27), carcinoma of the bladder and cervix, and anastomotic dehiscence (28).

Bacteria invasion of the muscle initiates an inflammatory or a granulomatous response, which results in the formation of purulent exudates, made up of neutrophil and macrophages. Hydrolytic enzymes released by neutrophil and macrophages into the surrounding tissues leads to tissue digestion, liquefaction and suppuration, with pus tracking down the muscle sheath.

CLINICAL MANIFESTATIONS

The triad of presentation comprises flank pain in 80% of patients, limitation of hip movement from painful psoas spasm in 45% of patients and fever in 40% of cases. These three symptoms when seen together are termed the triad of psoas abscess, and are seen in less than 50% of cases (2,3). Other features include back pain and limitation of back movement, abdominal pain extending to the loin,

painful hip stress test, tender, soft and dull compressible mass in the iliac fossa, lumbar fullness with swelling extending below the groin, which can be emptied. Features of the predisposing illness may be apparent.

Clinically, psoas abscess must be differentiated from renal abscess, ruptured epigastric artery, femoral hernia, saphenous varix, lipoma, rupture of adductor longus with haematoma, femoral aneurysm, iliac artery aneurysm, iliac lymphadenopathy, chondrosarcoma of ilium and osteoarthritis of the hip.

DIAGNOSIS OF PSOAS ABSCESS

Diagnosis of psoas abscess is premised on a high index of suspicion, meticulous clinical examination, and radiological, microbiological and other ancillary investigations. A complete blood count may show evidence of leucocytosis and neutrophilia with raised C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), suggesting an inflammatory process. Plain abdominal radiograph of the lumbosacral region may show obliteration of the psoas shadow on the affected side. Plain X-ray is of low diagnos-

tic accuracy (29). Ultrasonography is diagnostic in 70% of cases and shows enlarged psoas or hypoechoic mass in the psoas region although small sized abscesses may be missed (29). Computerized Tomographic (CT) scan is diagnostic in 91% of cases and lesion shows as hypodense mass in the psoas region (29). It also has the advantage of imaging surrounding structures like vertebra, kidney, pancreas and the bowel. Although gallium scan is diagnostic in only 80% of cases, it is superior to CT-scan in demonstrating concomitant bony infective focus (30). CT-guided aspiration of abscess provides specimens for microbiological evaluation and may be used as a form of therapy. Magnetic Resonance Imaging (MRI) better delineates the extent of inflammatory changes and demonstrates abscess distinct from surrounding soft tissue without the need for contrasts (29,31). Bone marrow infiltrate in osteomyelitis of the vertebrae is also better demonstrated.

TREATMENT OPTIONS

The management of psoas abscess involves the treatment of the abscess and the predisposing or underlying illness. Treatment op-

tions include medical (15) or surgical approach but in most cases a combination of the two is required (15,16,17,18). If detected early, antibiotics may be used as a sole treatment option (15,18) but this is usually for long and therefore rarely used alone. Antibiotic selection should be based on result of microbiological cultures and sensitivity (15-18). Since *Staphylococcus aureus* appears to be the commonest cause of primary abscess, third generation cephalosporin or vancomycin may be used pending the result of culture and sensitivity. Percutaneous ultrasound or CT-guided needle aspiration followed by culture/sensitivity and the use of appropriate antimicrobial agents is a very popular therapeutic approach (10,14,32,33). Percutaneous drainage with catheter left in situ is advisable particularly when bowel pathology is suspected (32,33). Open drainage is the preferred option when gastrointestinal diseases are the cause of psoas abscess. This option allows simultaneous treatment of the underlying illness and allows for adequate debridement of necrotic psoas muscle and drainage of the abscess cavity. Drainage can be performed through several

approaches such as via the petit triangle. This triangle is by the side of the abdomen and is bounded by the iliac crest, lattismus dorsi and the external oblique muscle (34). The lateral approach is through mid, one-third of the iliac crest. Anterior approach is underneath the inguinal ligament while the Ludluff incision is medial approach to the hip. Treatment of the underlying cause is important, for example, transabdominal resection may be performed in Crohn's disease or carcinoma of the colon. Failure to completely drain abscess may occur when the abscess is multiloculated or when there is underlying bowel lesions or when there is muscle involvement without liquefaction. Open drainage is preferred in this situation where bony or cartilaginous sequestra in the tract or the diseased vertebrae can be removed (34). Supportive treatments that may be necessary include anticoagulation, because of the increased risk of pulmonary embolism in these patients (13). Arthrotomy of the hip may be necessary when iliopsoas abscess lies adjacent to the hip capsule (20).

COMPLICATIONS FROM DELAY DIAGNOSIS

Complications that may arise from delay in the diagnosis of psoas abscess include iliac vein thrombosis due to compression by the abscess (13). This may lead to pulmonary embolism. Hydronephrosis due to compression of the ureters and renal failure may occur. Atrophy of the psoas muscle may occur in protracted case (5). There may be flexion contracture of the hip. Recurrence of psoas abscess may occur if underlying predisposing cause is not removed. Further dissemination of organisms especially in immunocompromised patients may also occur.

CONCLUSION

Although psoas abscess is a rare entity, occasional cases are seen now and then. It requires that clinicians must have high index of suspicion and be conversant with the diagnostic imaging techniques, common aetiologic agents and surgical techniques employed in the management of this condition.

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