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*Case Report*

# Dumb-bell shaped tuberculous abscess across the greater sciatic notch compressing both sciatic nerves

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We report an instructive case of a 65-year-old man who presented with a dumb-bell shaped tuberculous abscess across the greater sciatic notch bilaterally compressing both sciatic nerves. Clinical symptoms progressed slowly and mimicked lumbar radiculopathy, thus delaying an accurate diagnosis. Anterolateral retroperitoneal and posterolateral gluteal approaches of the greater sciatic notch as well as the acetabulum on both sides were followed in order to provide safe viewing and resection of the abscess. The abscess wall was adherent to the sciatic nerve and surrounding blood vessels. The symptoms completely disappeared after resection of the abscess.

**Keywords:** tuberculous abscess; mycobacterium tuberculosis; sciatic nerve palsy; greater sciatic notch

## Introduction

The most common sites for a tuberculous abscess are in the lumbosacral vertebral axis, around the sacrum and the hip joint. When the abscess develops within or around the pelvis, the course is usually insidious and the clinical symptoms may be obscure. However, such lesions may infrequently be associated with neurological complications including sciatic nerve compromise.[1]

This instructive case report describes a patient presenting with a dumb-bell shaped tuberculous abscess in the greater sciatic notch on both sides causing irritation of both sciatic nerves. We also discuss the surgical procedure used to remove the abscess.

## Case presentation

A 65-year-old man came to our clinic complaining of pain in both legs and the presence of a painful mass in the left gluteal region. About 5 years prior to presentation, he became aware of left-sided lower leg and low back pain. In another institution, he had been examined by myelography which showed a slightly narrow lumbar spinal canal and a bulging of the intervertebral disc at L4-5 level. A provisional diagnosis of a lumbar disc herniation was made at that stage. Administration of non-steroidal anti-inflammatory drugs for a short period of time alleviated his symptoms although they progressed slowly. No further examination followed until the current presentation. The patient had pulmonary tuberculosis at 21 years of age which required thoracotomy for the right upper lung.

On presentation, he was unable to ambulate due to radicular pain extending from the groin to the calf predominantly on the left side. Physical examination showed a painful elastic-hard mass, $7 \times 9$ cm in size, located posteromedial to the left hip joint. Percussion of the mass produced severe radicular pain in the left leg. Neurological examination revealed a positive straight leg raising test at 30 degrees on the left and at 50–60 degrees on the right side. There was hypesthesia at L5 to S3 dermatome on the left and at L5 as well as the S1 area on the right. Manual muscle testing showed weakness of the left tibialis anterior (grade $4^+/5$), extensor hallucis longus (grade 4/5) and gastrocnemius (grade $4^+/5$) muscles. Deep tendon reflexes were normal bilaterally, but bladder function was slightly abnormal with reduced sensation of urinary retention and pollakiuria. Blood tests showed a slightly elevated erythrocyte sedimentation rate (26 mm/h and 38 mm/2 h) and increased C-reactive protein (1.9 mg/dl) but no leucocytosis. Mantoux reaction was positive. Blood chemistry was normal, and sputum culture as well as urine bacteriology were unremarkable.

Radiographs of the lumbar spine and the sacrum showed slightly osteolytic lesions at the anterior margin of the L5 and S1 vertebral bodies and irregular calcification ventral to the S1 vertebra, but $^{99m}$technetium phosphate scintigraphy was negative. Radiographs of the acetabulum and hip joint were normal. Computed tomography and magnetic resonance imaging (MRI) showed a dumb-bell mass lesion in the greater sciatic notch extending bilaterally

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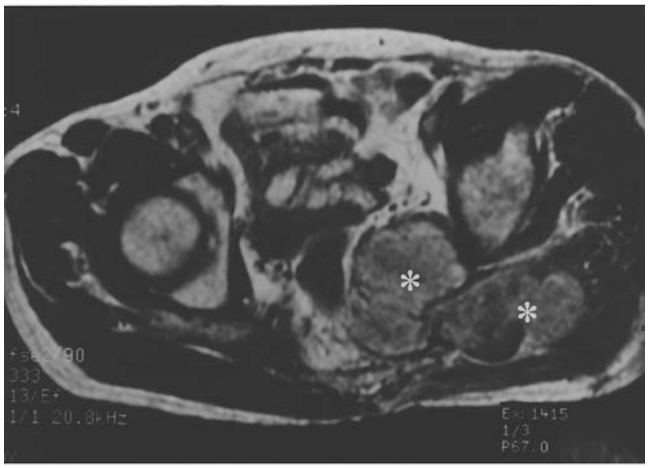

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**Figure 1** (a) Computed tomography scan showing tumourous lesions beneath the sciatic notch bilaterally (L, left side; asterisk, lesion). (b) T1-weighted magnetic resonance image (TR, 333 ms, TE, 13 ms) (asterisk, lesion). (c) coronal magnetic resonance image (T2-weighted; TR, 3600 ms, TE, 80 ms) showing the tumourous lesion extending bilaterally distal to the greater sciatic notches (R, right side)

(Figures 1a–c), suggestive of a pool of liquid or liquescent material within the mass. Administration of gadolinium-diethylenetriaminepenta-acetic acid increased slightly the intensity of the signal in the periphery of the lesion on a T1-weighted MR image. A solitary lesion isointense to the intrapelvic mass on MRI was discovered within the right iliopsoas muscle at L4 vertebral level. $^{97}$Gallium citrate scintigraphy was thus indicated but showed no abnormal accumulation of the radioisotope in the lesions. No neovascularisation or tumourous stain was found on arteriorgraphy (Figure 2), but imaging showed an abnormal bifurcation and displacement of the internal as well as external iliac arteries. These findings were suggestive of a cyst, cystic-lesion or an abscess, compressing the iliac arteries and veins as well as the sciatic nerves bilaterally. An open biopsy of the gluteal mass lesion was performed, and a tuberculous abscess was highly suspected histologically.

The patient underwent one-session open resection of the right and left lesions. He was positioned on his right-side in a semi-decubitus posture, the dumb-bell shaped abscess on the left greater sciatic notch was approached by a combination of anterolateral retroperitoneal and posterolateral gluteal approaches. Posterior to the bladder, the intrapelvic portion of the lesion was identified at the level where the internal iliac artery divided into the superior and inferior gluteal, internal pudendal, obturator and inferior vesical arteries. Because the lesion was surrounded by these vessels, exploration of the mass lesion necessitated multiple ligations of the inferior gluteal, inferior vesical and internal obturator arteries, and a number of veins of the sacral venous plexus. Careful blunt dissection of the vessels from the surface of the lesion showed that the lesion wall was tightly covered by multiple fasciculi of the sciatic nerve. Extremely cautious dissection of these nerve bundles from the surface of the lesion further allowed exposure of the


**Figure 2** Preoperative arteriograph showing displaced superior as well as inferior gluteal, internal pudendal and inferior vesical arteries particularly on the left side (L)

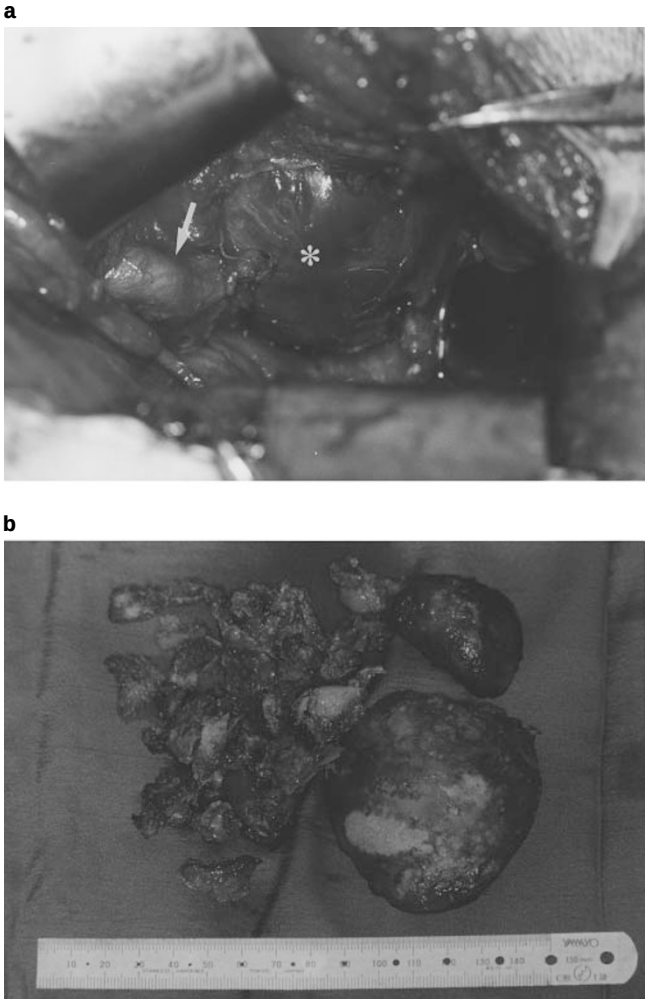

**Figure 3** (a) Intraoperative photograph showing the pelvic portion of the abscess (asterisk) after ligation of the inferior gluteal, vesical and internal obturator arteries (arrow, internal iliac artery). (b) resected abscess on the left containing necrotic tissue, fibrous debris and caseous mass

entire intrapelvic portion of the lesion (Figure 3a). A posterolateral incision, extending proximally and medially, was then made to expose the piriformis and internal obturator muscles. The extrapelvic portion of the abscess, $9 \times 11 \times 7$ cm in size, was identified between the piriformis and gluteus medius muscles. Following retraction of these muscles and protection of the superior gluteal artery and nerve, the abscess, surrounded by some bundles of the sciatic nerve, was carefully exposed beneath the greater sciatic notch. After very careful dissection of the nerve bundles from the abscess wall, the entire lesion was resected. The content of the abscess appeared dark brown in colour containing necrotic tissue, fibrous debris and a small amount of caseous material (Figure 3b) Next, placing the patient in a semilateral position (the right side was elevated by 45 degrees), the same combined approach was used to expose the abscess in the greater sciatic notch and in the iliopsoas muscle on the right side. A typical tuberculous abscess (a date-formed, $2 \times 1.5 \times 1.5$ cm in size, and containing caseous mass) was resected within the right iliopsoas muscle at L4 vertebral level. Retracting the abdominal aorta, common iliac artery and inferior vena cava, the prevertebral abscess located beneath the anterior longitudinal ligament between L5 and S1 levels was also resected. Distally, at the level where the common iliac artery bifurcates into the external and internal iliac arteries, blunt dissection of the lesion from blood vessels and sciatic nerve was carefully pursued, followed by exposure and resection of the abscess through the posterolateral gluteal address. Histological examination of samples from the resected lesions contained coagulated necrotic debris, dense and thick fibrous capsule with infiltration of some foamy cells, neutrophils and Langhans-type multinucleated giant cells. The histological diagnosis was consistent with that of an old tuberculous abscess, and the polymerase chain reaction test for the resected abscess wall confirmed the causative organism to be mycobacterium tuberculosis.

The pain disappeared completely within a short period postoperatively. There was a transient reduction in the strength of the hip adductor muscle on the left; however, this recovered in the second postoperative week, and the patient was ambulatory 3 weeks after surgery. Combined therapy with isoniazid (300 mg/day) and rifampicin (450 mg/day) was administered for 5 months. Neurological examination 7 months after surgery was normal, except for minimal hypesthesia of the left great toe.

## Discussion

Epidural tuberculous abscess and/or tuberculoma of the spinal cord are common causes of paraparesis, although the incidence may vary widely from one country to another. The abscess can develop within the pelvis, in the sacroiliac and hip joints or the proximal area of the femur. The present case was unusual with respect to the following: (i) initial clinical symptomatology was almost identical to that of lumbar radiculopathy caused by degenerative lumbar spine disease; (ii) the use of pain killers alleviated symptoms making diagnosis difficult; (iii) a lack of significant clinical features suggestive of a lower retroperitoneal intrapelvic abscess and tuberculous spondylitis in the lumbosacral level. Another significant concern in this case was the limited surgical access to the bilaterally dumb-bell shaped lesion with consideration of possible intraoperative bleeding and difficulties in separating the sciatic nerves and blood vessels from the abscess wall on both sides.

The sacroiliac region and hip joint are relatively common sites of nonspinal tuberculosis.[2] Clinical symptoms of infectious lesions in these areas may mimic those of lumbar nerve root involvement.[3–6] Chen *et al*[1] reported chronic sciatica caused by

tuberculous sacroiliitis, and Lourie *et al*[3] described the significance of sacroiliac pyarthrosis as a cause of radicular leg symptoms. Recently, we also described patients with pyogenic sacroiliitis with symptoms mimicking those of lumbar disc herniation.[6] The diagnosis of sacroiliac, intra-iliopsoas or lower sacral lesions may be less likely particularly when they present as slowly progressive granulomatous (tuberculous) lesions.[7,8] However, we are unaware of reports describing the presence of a large tuberculous abscess caudal to the sacroiliac region that caused sciatic nerve palsy. A limited number of transaxial MR images may be sufficient to recognise and identify lower intrapelvic lesions compressing the sciatic nerve. In our patient, this was not performed during the initial follow-up prior to consulting our clinic. An extensive diagnostic workup, including bone and soft tissue scintigraphy, angiography as well as biopsy, must be considered in order to differentiate a tuberculous abscess from a malignant lesion.

Treatment of a tuberculous abscess includes drainage, curettage, partial or total resection of the lesion, combined with chemotherapy. An abscess in the paravertebral area of the iliopsoas muscle can be treated adequately with a combination of curettage and anti-tuberculous chemotherapy. Preoperatively, in our case, we were uncertain whether curettage of the abscess would eliminate radicular pain and result in recovery of sciatic nerve palsy. Preoperative enhanced MR images indicated the presence of a thick and dense abscess wall, suggestive of an old abscess and a firm adhesion between the abscess wall and sacral nerve plexus as well as major pelvic blood vessels. We also considered that neurological recovery might be less likely if the large space-occupying dumb-bell formed lesion was not resected or reduced in size. Due to the anatomical complexity of the region,[9,10] combined anterolateral retroperitoneal and posterolateral gluteal approaches was thought to be most suitable to obtain a direct, wide and safe operative view of the field. During surgery, however, extremely careful and time-consuming dissection was necessary to separate the abscess from the veins and sacral nerve plexus that had tightly adhered to the lesion. The multiple approach also increased the operation time (16.5 h) in this case. In this regard, to reduce the operation time, the transiliac lateral approach described by Judet *et al*[11] and the extended iliofemoral approach by Kellam and Tile[12] might have been suitable for directly addressing the greater sciatic notch anteroposterioly and retroperitoneal lumbosacral vertebral level simultaneously. However, osseous reconstruction of the osteotomised ilium and restructuring the gluteus maximus as well as medius muscles bilaterally may significantly hinder the early ambulatory rehabilitation in a patient who underwent bilateral transiliac approach. Our patient was ambulatory in the early part of the third postoperative week despite extensive and major surgery. Based on the current experience, we suggest a combination of anterolateral retroperitoneal approach and posterolateral gluteal address of the dumb-bell shaped tuberculous abscess or other similar lesions although this procedure may prolong the operation time.

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