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Ultrasound-guided aspiration of Psoas abscess in a 28 year-old male: A case report, literature review and the relevance of this technique in the developing world

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ABSTRACT

With the advent of highly efficacious chemotherapeutic agents and egression of novel image-guided, interventional techniques; various simpler and minimally-invasive management protocols have emerged in the treatment of Pott's spine over the past decade. The current article discusses the relevance of minimally invasive, USG-guided aspiration of a large psoas abscess in a 28 year old male; and elaborates upon the general consensus in the current literature on the pertinence of this technology in TB spine management.

Keywords: Psoas, abscess, ultrasound, novel, image.

Introduction

With the advent of highly efficacious chemotherapeutic agents and egression of novel image-guided, interventional techniques; multitudinous simpler and minimally-invasive management protocols have emerged in the treatment of Pott's spine over the past decade. The older, aggressive surgical modalities have, thence gradually been replaced more sophisticated and less morbid minimal-access procedures[1-3].

The current article discusses the relevance of minimally invasive, USG-guided aspiration of a large psoas abscess in a 28 year old male; and elaborates upon the general consensus in the current literature on the pertinence of this technology in TB spine management.

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Case Report

A 28-year old male had presented to us with severe right hip pain of 3-month duration, which had progressively increased over the preceding 2 weeks.

It was a continuous and severe pain with complete restriction of all activities of daily living; accompanied by occasional episodes of fever, weight loss (of 4-kilograms) and night cries (for 2 weeks).

On clinical examination, the patient had severe restriction of movements of the hip joint, in the sagittal and rotational planes. The patient was in significant distress; and had a marked tenderness over the paraspinal area.

Examination of the rest of the musculoskeletal system was unremarkable.

Among the serological investigations, the acute phase reactants (ESR, CRP) were notably raised. The roentgenograms (Figure 1) displayed mild lumbar scoliosis with decreased disc space at L4-5 level with osteopenia of the adjoining vertebrae and end plate changes; and a significantly identifiable soft tissue mass in the region of the right psoas tendon.

Fig 1: Plain Xray AP/ lateral

The patient then underwent MRI scan of the abdomen and pelvis, which revealed typical, spondylodiscitic changes at L4-5 level and a large, multi-loculated abscess in the right psoas tendon of 17*15 cm in size(Figure 2,3,4).

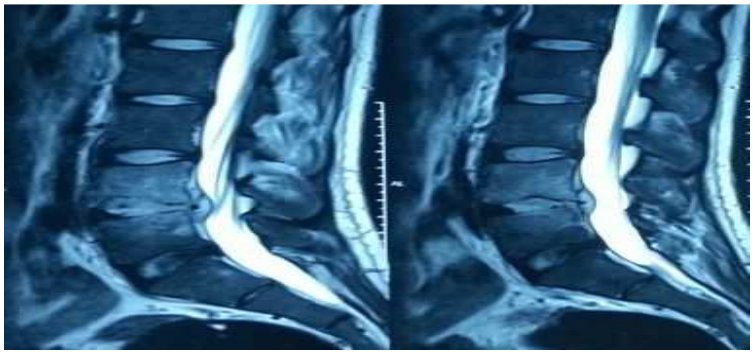

Fig 2: Sagittal MRI showing L4-5 spondylodiscitis

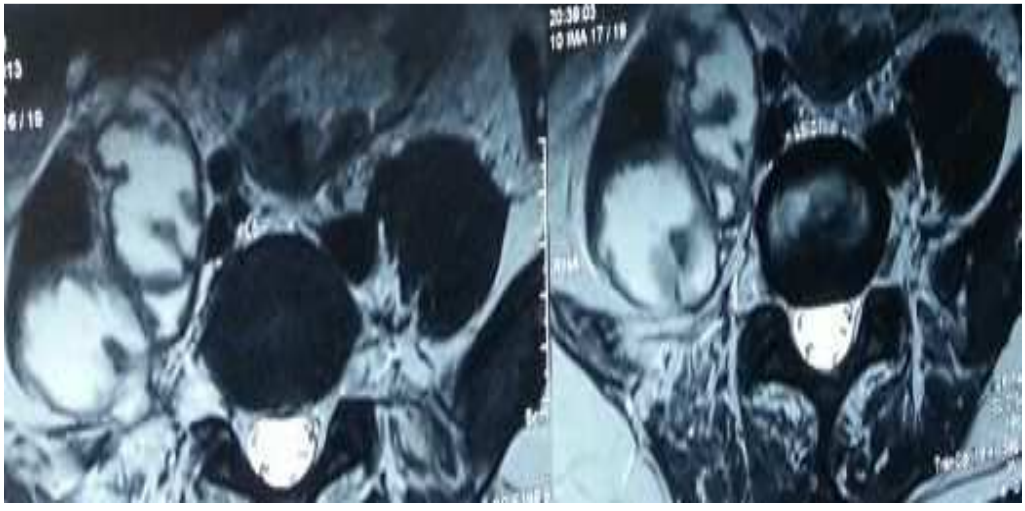

Fig 3: Axial MRI showing L4-5 spondylodiscitis with multiloculated right sided psoas abscess

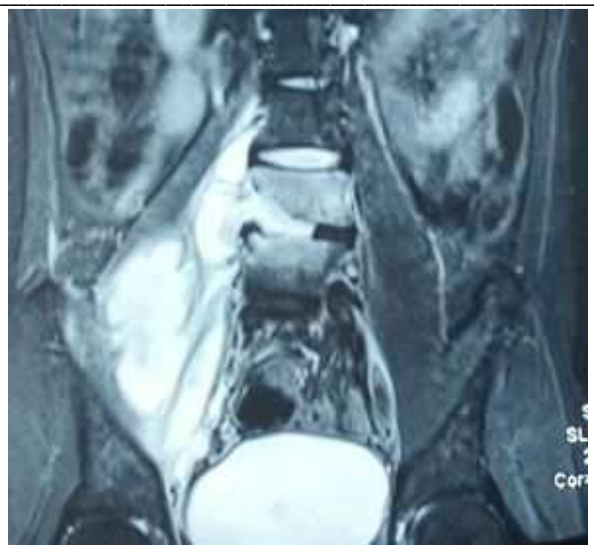

Fig 4: Coronal MRI showing L4-5 spondylodiscitis with multiloculated right sided psoas abscess

The clinico-radiological picture, at this stage, indicated some infective pathology as the most probable etiology; and the succeeding plan of draining the absess was decided upon; so as to serve the dual purpose of decompressing the infective load as well as obtaining tissue sample for biopsy and culture/ sensitivity. The patient underwent percutaneous abscess drainage (through posterior approach) under sonographic guidance (Figure 5) and as much as 110 ml of frankly purulent material was drained out. The patient also simultaneously underwent transpedicular biopsy at L4 level under guidance of an image intensifier. The patient was empirically started on anti-tubercular and intravenous antibiotic regimen. After confirmation of tubercular pathology (chronic granulomatous pathology on biopsy and positive tubercular culture), the patient was continued on anti-TB medications. The medications were discontinued after chemotherapy for a period of 6 months; and the recuperation during the entire therapy was satisfactory.

Figure 5: USG guided aspiration

Discussion

The concept of management of tuberculosis has undergone a sea of changes, over the past century, owing to the inception of multitudinous, highly efficacious chemotherapeutic options against the mycobacteria. However, the surgical intervention may be additionally required, in situations where factors such as instability, neurological compromise, impending/ progressive deformities or purulent collections (intra-abdominal/ retroperitoneal) may co-exist[4]. Psoas abscesses usually accompany these vertebral lesions and need to be drained surgically, so as to obtain a tissue diagnosis/ culture and antibiotic sensitivity testing; as well as enhance the local action of the drugs (by facilitating their penetration to the areas which might otherwise be grossly inaccessible owing to these large abscesses). The advent of various sophisticated imaging modalities has led to gradual replacement of the traditional open surgical drainage procedures by minimally invasive abscess decompression techniques[1-3,5-7]. Nevertheless, their relative efficacy in large abscesses has been an issue of dubiety and open surgical drainage has still been advocated as the standard of care in large, thick walled, multiloculated abscesses, especially in the inaccessible regions. The current article intends to discuss our experience with a large psoas abscess in a 28 year old male, where we had employed sonographic guidance to percutaneously drain a large collection of multiloculated, purulent material in the muscle. The other image-guided modalities, which might be utilised in such sitations; and their relative pearls and pitfalls, especially in the scenarios involving patients of the developing world; as well as an outline of the procedural and technical details of USG-guided drainage have been elaborately discussed.

Open surgical drainage has still been considered the traditional gold-standard adjunct to medical management in the treatment of large-sized psoas abscesses. Image guidance has provided a useful alternative to these aggressive operative interventions, especially in stages, where the bony or discal involvement is relatively much less extensive than the actual soft tissue lesion (GATA stage IB)[8]. In our patient, we had employed this technique, not only as a means of diagnostically evaluating the extent and nature of the lesion, as well as to therapeutically vent out the collected material. It can be done, either as a planned procedure or on an emergency basis in a patient with septic complications [9]. A portable machine can also be used in the operation theatre if other procedures like vertebral biopsy are planned in the same sitting.

Psoas abscess can be easily diagnosed as well as characterized at the time of intervention with the help of Ultrasound Imaging. The psoas muscle can be seen using a curvilinear (low frequency Ultrasound probe) with anterior, lateral and posterior approaches - especially in thin individuals; and if the bowel gas is less (anterior approach). For the purpose of description the psoas can be divided into three sections:[9] Upper section, from the origin of the muscle to the lower pole of the kidney; mid section, from the lower pole of kidney to iliac crest; and the lower section, from the iliac crest to fusion with the iliacus. The upper and mid sections can be well visualized through posterior approach. The muscle with abscess appears as hypoechoic area/ collection within the muscle.

Ultrasound can pick up the number, locularity, size (including volume) and location of the abscess within the muscle.

MRI and CT guided drainage[11,12] are the other alternative techniques, which might be employed to deliver the intramuscular pus percutaneously. However, ultrasound may be considered as the prime modality of choice, especially in the developing nations, for the following reasons: It is simple to use, portable, cost-effective and lacks risk of exposure to any ionizing radiation. A pre-procedural ultrasound evaluation (for the elective patients) is of always immense importance, irrespective of additional cross sectional (CT and MRI scan) modality evaluations which might be employed, as an interventional approach can be well planned simultaneously at the same sitting. A large abscess can be approached through the anterior abdominal wall. The Colour Doppler technique depicts the blood vessels in the needle path; and a safe needle approach can be planned to avoid vascular injury[13,14].

CT and MRI guided aspirations, though are viable alternatives, share the common disadvantages in the settings of a developed country, including high procedural complexity, significant cost-prohibitions and restricted availability [5-7,10,12,15].

Such procedures may not be as widely accessible to the populations, belonging to the semi-urban or rural settings, as ultrasound. CT also carries the significant disfavour among the physicians, due to the risk of radiation exposure. Continuous, percutaneous drainage can also be performed using a catheter with imaging guidance but may carry a risk of fistula formation, especially in a tubercular abscess [7].

One of the most pertinent clinical situations, where these Ultrasound-guided aspiration and pus drainage may be used, includes a toxic, highly debilitated patient, who may not be sufficiently stable to undergo a morbid, open procedure. The most relevant contra-indications for PDAFC (Per-cutaneous drainage of abscesses and fluid

collections) include significant coagulopathies and absence of relatively safe pathway for the abscess drainage[14].

Literature indicates a risk of treatment failure, exceeding 30% in some studies[9]. The risk of treatment failure or prolonged catheterization increases with tuberculous collections and viscous, debris-laden collections involving adjacent muscle necrosis[15]. Other commonly described complications include, repeated failed attempts and subsequent conversion to open surgery. Studies have revealed overall complication rates of 5.3% including bleeding or hematoma, and conversion rates to open surgery of 4.6%, following this procedure[16-18].

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