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Radiology

The Contribution of MRI in the Management of Paraplegia, the Experience of the "Marie Curie" Medical Clinic: About A Case

Dr. Traore Ousmane[1,2,5*], Diallo Aissata[1], Kouma Alassane[2], Sylla Kandjoura, Mahamadou[3], Bagayoko Ousmane Lansenou[1], Ouncoumba Diarra[4], Diallo Mahamadou[5], Keita Adama Diaman[6]

[1]Radiology Department of the Medical Clinic "Marie Curie" Bamako-Mali
[2]Radiology Department of the Medical Clinic "Les "STARS" Bamako-Mali
[3]Medical Clinic "SIRAMANA" Bamako-Mali
[4]Radiology Department of the Reference Health Center of Commune III Bamako-Mali
[5]Radiology Department of the University Hospital Center (CHU) Gabriel TOURE Bamako-Mali
[6]Radiology Department of the University Hospital Center Point "G" Bamako- Mali

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***Corresponding author:** Dr. Traore Ousmane
Radiology Department of the Medical Clinic "Marie Curie" Bamako-Mali

Abstract **Case Report**

Epiduritis is an inflammation of the epidural tissue, located around the spinal cord, between the dura mater and the spinal canal. Spinal epidural abscess is the complication of epidural inflammation and a potentially devastating entity responsible for paraplegia whose incidence is increasing with about 10% mortality. We report a case of epidural abscess diagnosed in the radiology department of the 'Marie Curie' medical clinic in Bamako-Mali with the aim of describing the contribution of Magnetic Resonance Imaging (MRI). This was a 44-year-old female subject referred for back pain and sudden onset paraplegia. An MRI exploration made it possible to diagnose epiduritis complicated by epidural abscess. A medullary decompression was made with the anatomopathological study which confirmed the diagnosis by finding a pyogenic germ. MRI is the state-of-the-art imaging in the management of spinal canal infection and its contents.

Keywords: MRI, paraplegia, epiduritis, infection, abscess and "Marie Curie" clinic.

INTRODUCTION

Epiduritis is an inflammation of the epidural tissue, located around the spinal cord, between the dura mater and the spinal canal. It is often due to Staphylococcus aureus, which affects the epidural tissue, most often from a skin lesion [1]. The formation of an abscess in this limited space leads to compression of the spinal cord more or less extended along the spinal axis, causing paraplegia or quadriplegia [1, 2]. This pathology affects more men than women, the mortality rate is around 10% in the literature [1, 3]. MRI is the reference technique for analyzing the spinal canal and its contents. Its sensitivity in this indication is greater than 95% [1-3]. We report a case of epidural abscess in order to describe the interest of MRI in the management of this pathology and paraplegia in general.

OBSERVATION

It was a 44-year-old adult woman with no known medical and surgical history. The story dates back to around a few weeks with the notion of dorsolumbar pain of sudden onset, diffuse abdominal pain and a walking disorder. Biological ultrasound and radiological examinations were requested and carried out. Ultrasound exploration revealed diffuse abdominal distention with intra-abdominal organ integrity. On biological examination, there was an increase in leukocytes, neutrophils, eosinophil's, and basophils. The blood ionogram was normal.

Performed at the Marie Curie Medical Clinic, the thoracolumbar F/P X-ray was also normal and the CT scan showed only lumbodiscarthrosis in L4-L5 and L5-S1 (Figure 1).

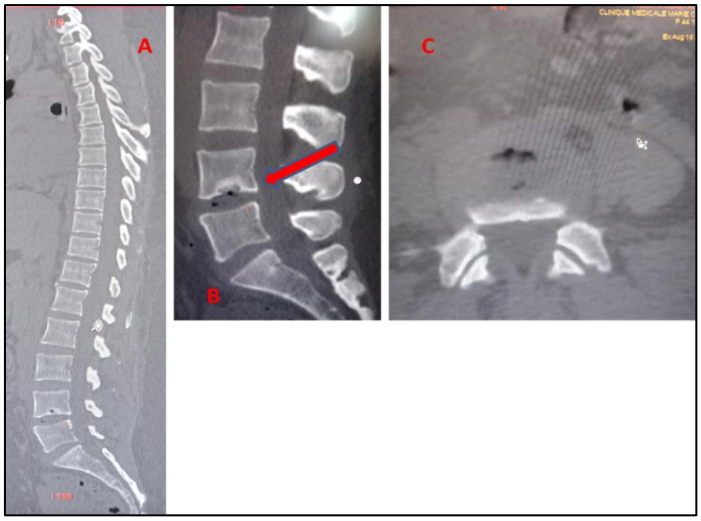

Figure 1: Lumbar CT scan in sagittal (A and B) and axial (C) reconstruction showing only geode of the lower vertebral plate of L4 with narrowing and empty disc L4-L5 and L5-S1 evoking lumbodiscarthrosis

Faced with the sudden onset of paraplegia, a spinal MRI was performed urgently at the Medical Clinic with the classic sequences (sagittal T1, sagittal T2, coronal and axial and T2 STIR), gadolinium injection sequences (sagittal and coronal axial T1) which showed epidural thickening with oval epidural collection in T1 hypo signal, T2 hyper signal next to D6-D7 and enhanced peripherally after injection of gadolinium. This collection exerted a mass effect with medullary compression opposite (Figure 2, 3).

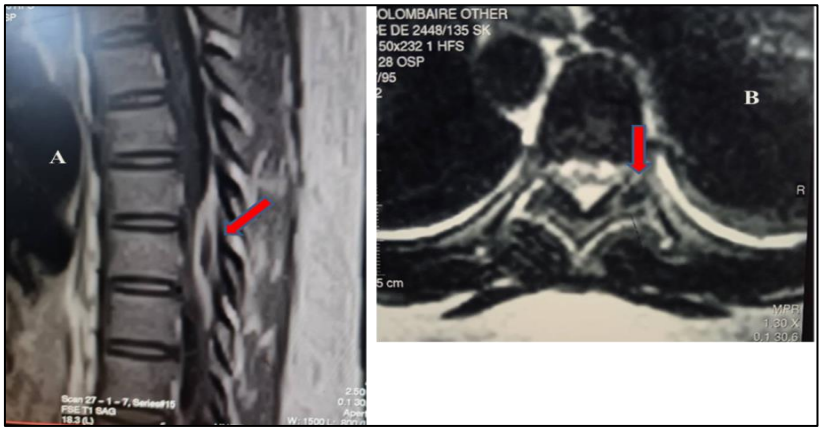

Figure 2: Sagittal (A) and Axial (B) T1-weighted MRI sequence with injection of gadolinium showing an oval epidural collection in hypo signal enhanced in the periphery after injection of gadolinium

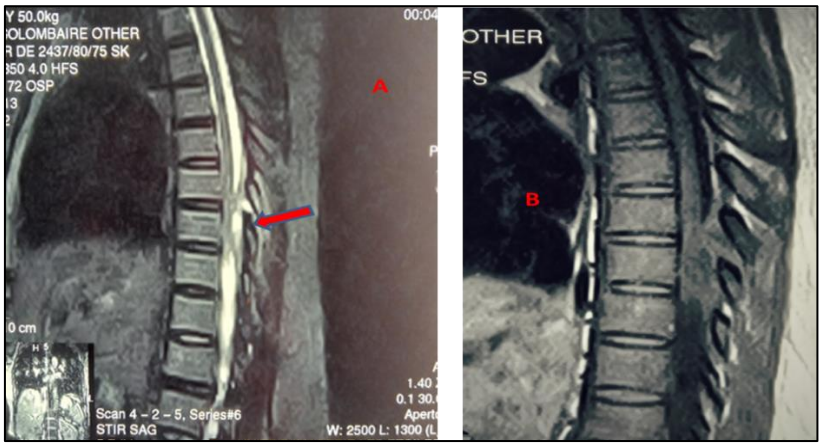

Figure 3: MRI in sagittal T2 (A) and sagittal T1 (B) sequence shows epidural thickening and collection in hypo signal T1 and hyper signal T2 next to D6-D7

MRI also showed protrusive L4-L5 and L5-S1 disc disease and confirmed the degenerative lumbodiscarthrosis described above by CT scan. Management was surgical via a posterior approach with medullary and radicular decompression with evacuation of the epidural abscess. The anatomopathological study found the responsible germ which was a staphylococcus aureus and a pseudomonas aeruginosa. Appropriate antibiotic therapy was established based on the antibiogram. His evolution was favorable and functional rehabilitation is in progress.

DISCUSSION

Clinical Characteristics

The most common symptoms of epidural abscess include back pain, radicular pain, motor or sensory dysfunction, fever, and bladder and bowel dysfunction [4, 5]. This pain is present in most patients with epidural abscess. Dorsolumbar pain was the first sign in our case. Pain may be incomplete or complete, and cord injury is present in 35% to 50% of patients at presentation [2, 5-7]. Our patient had no spinal cord involvement because the lesion was located opposite D6-D7 and far from the conus medullaris. It is thought that motor deficit in epidural abscess and epiduritis may be due to a combination of spinal cord and/or nerve root compression mechanisms and vascular ischemia [2]. In the study by Shah *et al.,* [5] it was reported that an abscess localized to the medullary conus is significantly associated with motor deficit and that the thoracic spine can allow a smaller abscess to injure the spinal cord with severe neurological damage. As it was in our case which presented a paraplegia. Previous studies show a predilection of the abscess for the thoracic spine possibly due to the larger epidural space at the thoracolumbar level [2, 8]. Bacterial germs found in patients are around 58% of cases and Staphylococcus aureus is most often responsible [4, 5]. In our case, Staphylococcus aureus and Pseudomonas aeruginosa were the germs found after the anatomo-pathological study.

Imaging Means

Definitive diagnosis of epidural abscess is best made with MRI and gadolinium injection, with a sensitivity and specificity greater than 90% [2, 9, 10]. It is non-invasive and also makes it possible to delimit abscesses under tension in the longitudinal plane [9]. The abscess appears iso- or hypo-intense in the spinal cord on T1-weighted MRI and hyper- intense in the spinal cord on T2-weighted images. In our case, the signal of the abscess was in hypo signal T1. If MRI cannot be obtained, computed tomography with IV contrast is the best choice [2, 8]. The CT scan performed in our home did not find any lesion but was also done with injection of contrast product. CT myelography is almost as sensitive as MRI, but it is more invasive and thus carries the risk of spreading infection into the subarachnoid space or causing meningitis [8, 11]. We did not have myoloscanner in our patient because the MRI was accessible. It is important to obtain imaging of the entire spine if there is concern for an end-jump injury not to delay therapeutic management. Imaging reveals not only the presence and extent of epiduritis and epidural abscess, but also the degree of spinal cord compression [2]. The meticulous analysis of the various MRI examinations in particular confronted with the clinical- biological data and the anatomopathological examination allowed us to have an etiological orientation of this spinal cord compression. This clinical case study has shown the sensitivity and specificity of spinal MRI in the etiological diagnosis of epiduritis and epidural abscess. It is a difficult diagnosis because it is based on a set of non-specific clinical signs.

Treatment and Evolution

Surgical management consists of surgical decompression of the abscess which has long been considered best for the management of epidural abscess, particularly in the setting of neurological dysfunctions. [8, 10, 12-14]. Patients with focal motor deficit are more likely to show neurological improvement with surgery [14]. The proposal of antibiotic therapy alone has been reported in the literature [15] for patients without neurological deficit. Our patient had paraplegia and had spinal decompression surgery due to the presence of the abscess with spinal cord compression. The evolution of our patient was favorable and functional rehabilitation is in progress.

CONCLUSION

The diagnosis of epiduritis and or epidural abscess is difficult to establish quickly because the neurological signs are not very marked at the beginning. Magnetic resonance imaging made it possible to make the diagnosis of epiduritis complicated by abscess, which was confirmed by anapathology. It currently remains the most sensitive and specific examination for diagnosis in order to guide therapeutic practices.

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