EPIDURAL POST-TRAUMA ABSCESS

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SUMMARY

Epidural abscesses are uncommon forms of spinal infection, presenting severe complications due to its difficult diagnosis and management. Although diagnosis and management have evolved, mortality rates are still high, ranging from 5 to 32% according to literature. The authors present a case of thoracic spine fracture, evolving with an epidural abscess, in a patient suffering from ankylosing spondylitis, with longstanding steroid therapy. A rapidly progressive neurological deficit developed, which resolved after emergency decompression and fracture fixation. Despite of the long-term antibiotic treatment, the infection recurred, being controlled only after hardware removal. In cases of spine fractures associated to immunossupression, the hypothesis of epidural abscess, especially with intense pain or progressive neurological deficit, must be considered.

Keywords: *Spondylitis, ankylosing; Spine fractures; Thoracic vertebrae Epidural abscess.*

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INTRODUCTION

Epidural abscess is a rare form of spinal infection, with serious complications and high mortality rate.

Described by Morgagni in 1761, and defined as a clinical entity by Bergamaschi in 1820, epidural abscess had an invariably fatal evolution before the advent of antibiotics apud Browder and Meyers[1].

The first person to suggest a surgical treatment was Barth (1901), to subsequently state that surgery alone could not modify disease evolution apud Walker[2]. In 1925, Dandy reported a mortality rate of 83% in his case series apud Browder and Meyers[1].

The combination of surgical manipulation and therapy with antibiotics reduced mortality rates to less than 50% of the cases until 1950[3], and improved diagnosis has reduced rates to less than 30%[4].

The incidence of epidural abscess is 0.2 to 1.2 cases for each 10,000 hospitalizations, this number being higher in reference centers[5]. In the last decade, there was a sudden raise on the number of cases, not only in immunodepressed and drug-addicted patients, but because of the increased number of diagnostic and therapeutic percutaneous procedures, and of the improved sensitivity of diagnostic studies, which frequently were unable to identify an epidural abscess[6].

Despite of affecting people of all age groups, a higher number of patients in the sixth or seventh decade of life are affected, as well as a higher number of men (2:1)[7].

Some clinical factors predispose to infections, such as diabetes mellitus, drug addiction, kidney failure, presence of neoplasia, obesity, prolonged therapy with corticosteroids, and sepsis. Local predisposing factors are recent traumas [7], spinal surgery, epidural injections or catheters.

The most common etiologic agent is Staphylococcus aureus (70%), followed by Staphylococcus sp. (7%). In drug addicted individuals, a higher incidence of Gram-negative bacilli and pseudomonas is seen. In up to 40% of the cases, the infectious microorganism cannot be identified[6,8].

This study intends to present an epidural abscess case secondary to spine fracture, in a patient having ankylosing spondylitis.

CASE REPORT

54 year-old male patient with ankylosing spondylitis and involving the whole vertebral spine, admitted in the hospital after car accident, where a thoracic trauma was identified with six back arc fractures. X-ray images of the spine did not show changes, but the patient presented with strong thorax pain, preventing him to remain seated. At physical examination, the patient reported pain at palpation on the medium line, at the level of scapular angle. A computed tomography scan was requested, but this did not identify any bone injury.

On the fifth day after trauma, the patient remained with uncontrollable pain, and started to present weakness on the lower limbs, as well as urinary retention. Suspected of spinal canal compression, the patient was submitted to Nuclear Magnetic Resonance of the thoracic spine, where epidural fluid collection was identified primarily interpreted as hematoma, from the fifth to the eighth thoracic vertebra, as well as a horizontal fracture line affecting the body and posterior elements of the seventh thoracic vertebra, although without deviation (Figure 1).

The patient was then submitted to emergency decompression and, as early as laminectomy was performed, an abundant amount of purulent material could be removed from canal. Laminectomy was enlarged up and down by one level from the point where fracture by shearing was seen, allowing a thorough cleaning of the spinal canal and extensive irrigation with saline solution. Fracture was shown to be unstable, especially after laminectomy. For this reason, we decided to provide fixation with pedicular screws at T5, T6, T8 and T9. The patient showed improved overall health status and gradual recovery of the muscular strength on lower limbs, also recovering his ambulation ability (with the aid of walkers) on the eighth postoperative day, as well as urinary control on the 21st day after decompression. Fluid culture results evidenced the presence of Beta-lactamase-positive Staphylococcus Aureus B, sensitive to Ciprofloxacin. He was treated with endovenous antibiotics until his laboratory tests were shown to be normal (Table 1), followed by a period of six weeks on oral antibiotics regimen.

Three months after surgery, his muscular strength was normal and no signs of infection could be seen. In addition, fracture union

Study developed at Cajury University Hospital
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signs were identified on the X-ray study. On the tenth postoperative month, he presented with fever and leakage of purulent fluid through surgical wound, with the same pathogen being identified. He was prescribed with antibiotics for six weeks, but the picture did not resolve. We decided for a new surgical approach, when no epidural abscess was found, but infection next to the synthesis material, which was removed, since there were evidences of bone union. A new antibiotic therapy regimen was recommended for six additional weeks, when symptoms were controlled and laboratory tests went back to their normal levels. A last clinical evaluation, 18 months postoperatively, showed normalization of the clinical and laboratory picture of that patient.

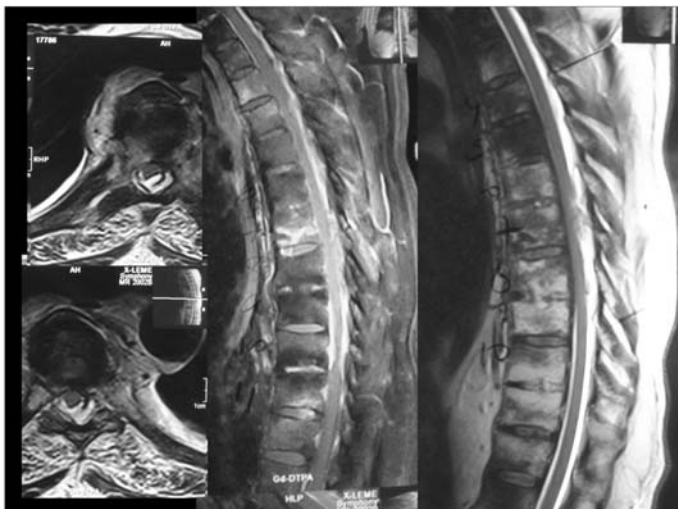

Figure 1- *NMR scan showing injury on T7 body and lamina, as well as epidural collection extending from T5 to T10, described on the test report as epidural hematoma.*

Table 1 - *HSS and RCP values*

Date	VHS (mm/h)	PCR
Early Post-Op	130	76
7th Post-Op day	70	82
3 months postoperatively.	20	60
6 months postoperatively	30	30
10 months postoperatively	70	60
18 months postoperatively	07	20

Post-Op = postoperative; HSS= hemossedimentation speed; mm/h: millimeters by hour; RCP= reactive C-protein.

DISCUSSION

Ankylosing spondylitis (AS) is a chronic inflammatory disease that affects the whole vertebral spine and results mainly in motility and bone mineral quality loss. AS patients are at high risk of experiencing spinal fractures with special characteristics, such as shearing, that may remain unperceived in over one third of the cases[9]. Trauma and immunodepression (in this case, secondary to prolonged AS treatment) are factors predisposing the development of epidural abscess[3,4,6].

Its association to closed trauma is seen in up to 15% of the cases[10], but a primary infection source usually exists and can be identified. Trauma is believed to cause an epidural hematoma, and this gets infected. However, few reports in literature prove this theory, with only two reports of epidural abscess being associated to spine fractures. One of these occurred 48 hours after a T12 fracture, and was associated to cellulitis on the right upper limb (patient's venous access)[11]. Neurological deficit occurred in one patient (Frankel A, according to the authors), which regressed to Frankel C after emergency decompression and stabilization, 72 hours after trauma.

In the other case, epidural abscess occurred after a sacral fracture in a drug-addicted patient presenting sacral roots deficit after trauma[8]. Urinary infection was also present, being regarded as the source of the fever experienced by the patient. Decompression surgery was recommended on the tenth day after fracture, because no neurological deficit improvement had been seen and unsuspected infection. The deficit recovery could not be appropriately measured because of the presence of sacral roots traumatic injuries. In both cases, the identified pathogen was *Staphylococcus aureus*.

Epidural abscess may present as a non-specific form, with variable complaints of pain, palsies and constitutional symptoms, followed by sudden and fulminant worsening[8]. The most common symptom is pain (in 90% of the cases), followed by fever (60 - 70% of the cases)[10]. Muscular spasm, motion restraint, and difficult ambulation may be present, but neurological symptoms are present in less than 30% of the patients at diagnosis. When we analyze the whole course of the disease, neurological deficit is present in as much as 70% of the cases. The presence of sepsis signs, at the moment of diagnosis, seems to be the major prognostic factor, with some studies showing a mortality rate close to 100%[12,13].

In the currently reported case, painful picture associated to multiple trauma, ankylosing spondylitis X-ray changes, and the absence of clinical signs of infection, due to immunosuppression, were responsible for diagnostic delay. The presence of a progressive neurological picture associated to history of trauma, made us suspect of epidural hematoma, which may also be associated to spine fractures in AS. The requested NMR scan could identify the epidural mass, but was unable to distinguish hematoma from abscess[8,10] (Figure 1).

Concerning site, thoracic spine seems to be associated to a worse prognosis of neurological recovery, even after surgical decompression procedure, when compared to cervical and lumbar spine[2,3,6,12]. In this case, emergency decompression within less than 12 hours after the onset of neurological symptoms may explain the complete recovery of the patient's motor function. Although it seems logical that early decompression is associated to a better improvement, some controversies exist regarding the deadline for this procedure to be effective, with studies reporting times for decompression ranging from 8 to 36 hours, counting from the onset of neurological deficit[13].

Concerning laboratory tests, Soehle and Wallenfang[4] showed that RCP may have a prognostic value between the first and second weeks of treatment, but no diagnostic value[12]. HSS increases in a variable fashion, and Reihsaus et al have identified a rate of 6% of cases with normal HSS in their series of 117 patients with epidural abscess[5]. As for leukocytosis, it is present in 60-70% of the cases[6], and, on the study by Soehle and Wallenfang[4] it could be correlated to the prognosis. Leukocyte counting was significantly higher in the group of patients showing poor evolution, both at admission and over the treatment period. The lack of immune response in the described case, limits the value of laboratory tests as clinical follow-up parameter.

Surgical decompression is indicated in the presence of neurological deficit, and there are controversies about whether to use instrumentation or not after decompression because of the risk of contamination to the implant and perpetuation of the infectious process. In the case in question, instrumentation was used by the association of an unstable fracture with a decompressive laminectomy, despite of the contamination risk involved. Recurrence of symptoms and infection control after material removal corroborate the trend that,

whenever possible, the association of metal implants in cases of epidural abscess should be avoided.

an alternative described in literature is to drain abscesses through an epidural catheter followed by local irrigation, but usually electively and in patients without neurological deficit[10,13].

In patients with no neurological symptom and with good health status, antibiotics can be recommended as a single therapy, with no surgical decompression, since a careful clinical follow-up is provided and the surgical alternative is performed in cases of signs of sepsis or neurological symptoms. Savage et al treated 29 patients with epidural abscess using this approach, with a success rate of 83%. In that series, three patients required surgical decompression, and one passed away[3].

The recommendation of antibiotic therapy is to start with broad-spectrum drugs and anti-Staphylococcus coverage until the causal agent can be determined[3]. This endovenous therapy should be maintained for six weeks, and followed by oral antibiotic therapy until laboratory tests are back to normal levels.

Resurvey rate in epidural abscess is high (30-40%), and the persistence or increase of RCP seem to be reliable factors for recommending a required reintervention for controlling an infection[4].

CONCLUSION

The authors present a rare combination of pathologies, but call attention to the following:

The high degree of suspicion required to identify a thoracic spine fracture on patients with ankylosing spondylitis.

The risk of epidural abscess, even without infection or contamination of spine fractures in immunodepressed patients.

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