Extensive epidural abscess with surgical treatment and long term follow up

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Abstract

BACKGROUND CONTEXT: Spinal epidural abscess is an uncommon infection. There are few reports on extensive epidural abscesses.

PURPOSE: We report a case of an epidural abscess extending from C2 to the sacrum, with a long-term follow-up.

STUDY DESIGN: A case report of an extensive epidural abscess with surgical treatment.

METHODS: A 36-year-old male patient presented with a history of 15 days of fever and severe lumbar and neck pain. Magnetic resonance imaging disclosed an epidural abscess extending from C2 to the sacrum. Limited laminectomies were performed in the cervical, thoracic, and lumbar spine, and pus was obtained. A peptostreptococcus grew in cultures. The patient received 6 weeks of antibiotics.

RESULTS: The infection was successfully treated, and no neurological deficit was observed. The patient continued asymptomatic 5 years after surgery, and no deformity has developed.

CONCLUSIONS: A case of an extensive epidural abscess was successfully treated with limited laminectomies and antibiotics. This less invasive technique could treat the infection, and no late deformity has been observed.

Keywords: Spinal epidural abscess; Spinal infection; Extensive epidural abscess

Spinal epidural abscess (EA) is an unusual form of spinal infection, which may present as an isolated clinical entity or associated to vertebral body and disc infection [1–3]. The most common way of infection is hematogenous spread with either direct seed to the epidural space or to the vertebral body with extension to the epidural space; however, primary site of infection remains undetected in up to 50% of the cases [4]. EAs usually involve a limited segment of the spine; the most common locations of EA are thoracic and lumbar spine [5]. They are more common in the posterior epidural space unless they are associated to vertebral body infection [5,6]. EA cases caused by hematogenous seed to the epidural space have been reported to have a more aggressive course than other forms [7].

The incidence of EA has been reported to be 0.2 to 1.2 cases per 10,000 hospital admissions [2,6], but lately it has been observed an increase in its incidence, reaching up to 12.5 cases per 10,000 hospital admissions [8–10]. This higher incidence could be explained by an aging population, the use of epidural catheter, and immunosuppressive therapy [11–13].

Diagnosis may be delayed because there is no characteristic clinical presentation, and plain radiographs are frequently not informative [2,8]. Magnetic resonance imaging (MRI) has made the diagnosis easier, and it is currently the diagnostic standard [5,9,10,14,15]. The use of MRI may also explain the increased incidence reported in recently.

Only a few articles have described extensive EA [16–20]; some of them report patients with surgical treatment and with a short-term follow-up [16,17], whereas others present extensive EA managed with medical treatment [18,19,21,22]. We report a patient with an extensive
EA, involving from C2 to the sacrum, who had surgical treatment, with a long-term follow up.

Case report

A 36-year-old male patient, previously healthy, presented with a history of 15 days of malaise, fever, and severe lumbar and neck pain. He did not complain of neurological symptoms in his upper and lower extremities or sphincter disturbances.

The patient was febrile on admission (38°C), with severe pain in his neck and lumbar area, and limited flexion and extension of the cervical and lumbar spine to less than 10 degrees. Motor and sensory examination of the 4 limbs was normal, and a mild increase in deep tendon reflexes was found in upper and lower limbs. No clonus was found, Lhermitte’s sign was negative, and no other physical findings were found on admission. He had no history of a previous infection, and no portal of entry could be found.

Laboratory tests showed an elevated white cell count (12,300 cells/mm³), with an erythrocyte sedimentation rate of 94 mm/h (normal value: 0–20 mm/h) and a C-reactive protein of 22.2 mg/dL (normal value, 0–0.9 mg/dL). Cervical, thoracic, and lumbar spine plain radiographs and a Technetium bone scan showed no findings. MRI of the cervical, thoracic, and lumbar spine disclosed an extensive EA, continuous from C2 to the sacrum (Fig. 1).

To avoid future khyphosis, we performed limited laminectomies in the cervical spine (C3–C5), the thoracic spine (T5–T6), and the lumbar spine (L4–L5) instead of a long decompression. Pus drained from each laminectomy; each surgical site was washed, and a pediatric urinary catheter was passed up and down connecting these limited exposures to obtain a complete drainage of the epidural space. Irrigation was performed with several liters of normal saline until clear fluid was obtained. Each separate wound was closed over drains, which were kept for 3 days.

Gram stain showed gram-positive coccus, and intravenous antibiotic therapy was started with cefotaxime plus clindamycin. Intraoperative cultures revealed a peptostreptococcus 8 days after surgery, and the patient continued with clindamycin only. The patient was evaluated by the infectious diseases team for a possible immune defect, which was ruled out. Blood cells, including the lymphocyte number, were normal. No additional risk factors for anaerobic cocci infection like corticosteroid use, skin ulceration, or former dental procedure were found in this patient.

The motor and sensory examination of the four extremities was normal after surgery. The patient became afebrile 4 days after surgery, and he persisted asymptomatic onward. He was discharged from the hospital 9 days after surgery, and he completed total of 4 weeks of intravenous clindamycin plus 2 weeks of oral clindamycin at home.

At short-term follow-up 3 weeks after surgery, the patient was asymptomatic; his neurological examination was normal, and laboratory tests did not show any evidence of infection. MRI of the whole spine was performed 2 months after surgery; it did not show residual infection, and the spinal cord signal was normal (Fig. 2).

The patient has remained asymptomatic in a long-term follow-up 5 years after surgery, and physical examination and radiographs showed no deformity at that time (Fig. 3). MRI at the same 5-year follow-up ruled out any abnormality in his spine (Fig. 4).

Discussion

EA is an uncommon but severe infectious condition that may lead to mortality or morbidity, including significant neurological disability [9,10]. Prompt diagnosis and treatment should be instituted [23] because delay is associated with poor outcome [24,25]. The treatment of EA is controversial, with reports on surgical and nonsurgical treatment [1,16–19,22,26]. Many authors prefer surgical treatment because progression of infection is unpredictable even if appropriate antibiotic therapy is established [9], and neurological compromise can follow vascular involvement of the spinal cord [6,7,9]. They advocate decompression of the spine and stabilization as needed [4,10,17,24,25,27,28].

Different techniques have been described to decompress the spine [6,29,30]. A multilevel laminectomy for an extensive EA is an aggressive procedure for an already
compromised patient, and it carries the risk of postoperative instability [27], which could be followed by postsurgical kyphosis. The less invasive technique we used in this case to decompress the spine and clean it from the extensive infection was recently reported [16].

There are only a few cases of extensive EA reported [10,17,19,21,29,31]; all of them had an aerobic bacterium as a causative agent. The microbiologic study in our patient disclosed a peptostreptococcus, a variety of anaerobic coccus. No predisposing condition for this unusual agent was found [32–34]. A complete evaluation ruled out any immune defect, and the patient has not developed any new infectious disease afterwards in the 5-year follow-up. The culture grew the bacteria 8 days after the samples were seeded in an anaerobic media, which is an expected time for an anaerobic coccus, although it is a longer time than usual for bacteria causing pyogenic infection in the spine to grow.

Another unusual element of this case is the absence of neurological deficit despite the extensive compromise. Although up to 29% of EAs present without neurological compromise [8], most extensive cases reported have had neurological deficit. We hypothesize that the presence of an anaerobic bacterium might be related to the lack of neurological findings; future studies of similar cases should help to clarify this hypothesis.

To our knowledge, this is the first report of an EA extending from C2 to the sacrum with a long-term follow-up. This less invasive technique can treat the infection, and it can also avoid a long-term deformity.

References

Acute injuries of the cervical spine are recognized as a most common cause of severe disability and death after trauma, but still the diagnosis and treatment are often inadequate and delayed. Bohlman [3] studied 300 hospitalized patients with cervical spine injuries with or without paralysis, from 1950 through 1972. The results of laminectomy were compared with posterior stabilization and anterior fusion with and without decompression. The study showed that nerve root function in the upper extremity returned if dislocations were treated by closed reduction followed by posterior fusion. High mortality rates in this study were seen in quadriplegic patients who were treated with steroids and laminectomy. In addition, steroids were observed to cause gastrointestinal hemorrhage. This study suggested that patients with severe flexion injuries and torn posterior ligaments should be treated by open reduction and posterior stabilization. On the other hand, patients with hyperextension injury with torn anterior and posterior ligament should be treated by anterior fusion. If nerve root compression is caused by herniated disc or anterior bone fragment, then anterior decompression is indicated [3].

Reference