



Submitted on: 11/17/2020
Approved on: 12/08/2020

CASE REPORT

Spinal epidural abscess in adolescence: case report

Aléxia Alves Cabral¹, Cecília Pereira Silva², Amanda Freire de Almeida², Christian Candido Ferreira³, Ricardo Kalil Laviola⁴, Gabriel Kalil Laviola Oliveira e Silva⁴

Keywords:

Epidural Abscess,
Anesthesia,
Spinal,
Adolescent.

Abstract

Spinal epidural abscess (SEA) is a rare infectious emergency and capable of causing severe neurological deficits, especially in childhood. The mortality rate in adults varies from 5 to 23%, but in children the rates are even lower. This report aims to contribute to the scientific field by discussing a case of SEA in pediatrics. It is a teenager, 17 years old, presenting fever, low back pain and sebaceous cyst infected on her back for three days. She reports a history of drainage two days ago and a cesarean section with spinal anesthesia a year ago. Magnetic resonance imaging (MRI) of the lumbar showed posterior L1-L4 epidural collection. Epidural abscess drainage surgery was performed, with L3-L4 laminectomy, and positive culture for Methicillin-resistant *Staphylococcus aureus* (MRSA), sensitive to Vancomycin and Rifampicin. She was discharged after 21 days of intravenous Vancomycin, with a prescription for oral Rifampicin for three weeks. Previous skin infection is considered a classic precedent of SEA, suggesting that the patient's condition was preceded by furunculosis. The microorganism responsible for 86% of SEA cases in childhood is *Staphylococcus aureus*. Back pain after spinal anesthesia, fever, skin infection and possible condition of immunosuppression indicated investigation for SEA. Gadolinium-contrast MRI corresponds to the gold standard diagnostic approach for SEA. The suspicion of the disease in pediatrics is extremely important in front of fever, back pain and spinal sensitivity, and should receive due attention and investigation before an indicative clinic.

¹ Volta Redonda University Center, Medical School - Volta Redonda - Rio de Janeiro - Brazil.

² Santa Cecília Hospital, Department of Pediatrics- Volta Redonda - Rio de Janeiro - Brazil.

³ Santa Cecília Hospital, Department of Neurosurgery- Volta Redonda - Rio de Janeiro - Brazil.

⁴ Santa Cecília Hospital, RADIOVIDA - Volta Redonda - Rio de Janeiro - Brazil.

Correspondence to:

Cecília Pereira Silva.

Hospital Santa Cecília. R. 41-C, 160 - Vila Santa Cecília, Volta Redonda - RJ, Brazil. CEP: 27255-430. E-mail: ceciliavoltaredonda@gmail.com



INTRODUCTION

Spinal epidural abscess (ESA) is considered an infrequent, potentially serious infectious emergency, capable of causing severe neurological deficits, resulting from compression of the abscess in the spinal cord or nerve roots, which can lead to ischemia, especially if there is a delay in the diagnosis, and an early clinical and surgical approach is essential for a better prognosis¹⁻³.

It is characterized by a purulent collection, located between the dura mater and the vertebral canal, which may manifest as a sebaceous cyst and extend along the entire length of the spinal cord^{4,5}.

Its incidence varies, in the literature, from one case per 100,000 individuals to 0.2 to three cases in 10,000 hospital admissions, consensually being considered a rare condition, especially in childhood^{1,4,6,7}. The mortality rate in adults ranges from 5 to 23%, but in children, morbidity and mortality is lower⁶.

The present report aims to contribute to the scientific scope with the discussion of a case of ESA in pediatrics, improving data already found in the literature.

CASE DESCRIPTION

Adolescent, female, 17 years old, hospitalized complaining of fever (38.5°C), headache, low back pain radiating to the abdomen and infected sebaceous cyst in the upper third of the posterior part of the thorax, which had started three days ago. He informs that he performed the cyst drainage procedure manually, at home, five days ago and, in the emergency room, 48 hours before admission, with a prescription of oral Cefadroxil (500mg every 12hrs). During hospitalization, he reported onset of intermittent local low back pain two months after cesarean section, which occurred a year ago, with spinal anesthesia.

On physical examination, he weighed 115 kg, BMI 39.7 (above P97), facial pain, tachypnea, with diffuse lumbar and abdominal pain on palpation, more pronounced in the right hypochondrium.

Laboratory tests showed blood count with Hb 11.5g/dL; Ht 34%; leukocytosis with a left shift (16,000/mm³, 13% rods and 80% segmented), platelets 168,000/mm³; C-reactive protein (CRP) 292mg/dL; erythrocyte sedimentation rate (ESR) 130mm and two negative blood cultures. Tomography of the abdomen, thorax and skull, abdominal and pelvic ultrasound without alterations.

Intravenous treatment was initiated with Ceftriaxone (2g every 12 hours), Oxacillin (1g every 6 hours), Metronidazole (500mg every 8 hours).

On the fifth day of hospitalization, she had a blood count with Hb 11.9g/dL; Ht 35%; leukocytes (12,000/mm³, 4% rods, 70% segmented), CRP 109mg/dL, ESR 101mm. The headache and abdominal pain improved, remaining afebrile; but with persistence of low back pain. Therefore, magnetic

resonance imaging of the lumbar spine was requested with a posterior epidural collection from L1 to L4, lateralized to the left and insinuating itself into the ipsilateral neural foramina of L2-L3 and L3-L4; presenting intense peripheral/dural impregnation by the contrast medium (epiputitis), compressing and deforming the dural sac and roots of the cauda equina, measuring approximately 10x1.5cm in the longitudinal and anteroposterior axes.

Evaluated by the neurosurgeon, on the sixth day of hospitalization, who observed grade 4 paraparesis and neurogenic bladder, in addition to limitation and pain on flexion and extension of the spine on physical examination. Therefore, drainage surgery of the epidural abscess was performed with laminectomy of L3 and L4 on the same date. The secretion culture was positive for Methicillin-resistant *Staphylococcus aureus* (MRSA), sensitive to Vancomycin and Rifampicin.

Discharge after 21 days of intravenous Vancomycin (500mg every 6 hours), with prescription of oral Rifampicin (300mg every 12 hours) for three weeks.

Three months after the procedure, she had mild low back pain, with complete resolution of the epidural collection (Figure 1).

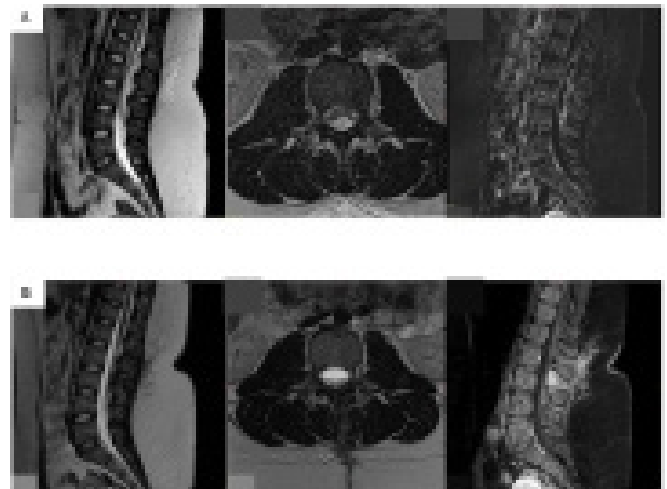


Figure 1. (A) Magnetic resonance imaging of the patient's lumbar spine on 05/20/2020, prior to surgical treatment. (B) Magnetic resonance imaging of the patient's lumbar spine on 08/27/2020, three months after clinical and surgical treatment.

DISCUSSION

Among the predisposing factors for the development of SEA are spinal trauma, spinal anesthesia or epidural block, previous neurosurgery, congenital spinal anomalies, previous skin infection/osteomyelitis, cancer, abusive use of intravenous drugs, history of acupuncture, diabetes mellitus, chronic renal failure, recurrent urinary tract infection, alcoholism and immunodeficiency^{2,5,6,8,9}. Such factors were found in only 35 to 67% of pediatric patients with ESA³.

Regional anesthesia is becoming more common in children. One should evaluate the advent of possible complications, such as bacterial infections due to catheter contamination, which correspond to 16 to 25% of cases of spinal anesthesia, and other more serious and less common ones, such as meningitis, epidural abscess and sepsis¹⁰. Wiegele et al. (2018)¹⁰ also report that subcutaneous insertion of the catheter or at a higher point, between L5-S1, may lead to a lower risk for these infections.

It is rare for ESA to appear in immunocompetent children who do not have risk factors⁸, which suggests that the patient had an immunodeficiency condition due to her obesity condition, which, together with her history of spinal cord anesthesia, favored the development of the ESA.

Previous skin infection is considered a classic preceding presentation of ESA, despite occurring in only 15% of cases⁸. The most common route of dissemination in children is hematogenous, followed by contiguity². Therefore, it is suggested that the patient's ESA condition was preceded by spinal column furunculosis.

The microorganism responsible for 50-90% of cases of ESA is *Staphylococcus aureus*, both methicillin-sensitive (MSSA) and resistant (MRSA) strains⁹, being the most common etiological agent in pediatric infections, in 86% of cases. Recent studies have observed an increase in MRSA etiologies in children without risk factors^{2,5}. Consistent with reports in the literature, MRSA was found in the secretion culture of the patient in question.

It is recommended that Vancomycin be the antibiotic of choice for the treatment of ESA, with a duration of 4 to 6 weeks, as was done in the patient. Early treatment is essential for better control of the infection^{2,4}.

The classic presentation of SEA consists of the triad of back pain, fever and neurological deficit. However, only a minority of patients will manifest it, especially the pediatric age group, which usually does not have risk factors or a clear clinical picture^{2,3}.

Severe pain located in the back is the most frequent and often underestimated symptom, and a more accurate investigation should always be carried out, with laboratory and radiological exams^{1,4}. The high incidence of back pain in the population, associated with the rare occurrence of SEA, makes its early diagnosis difficult⁴. Furthermore, ESA should also be suspected in febrile children with abdominal or hip pain, after ruling out other etiologies, as there are reports of acute abdominal pain disguising a possible ESA^{4,11}. Post-spinal anesthesia back pain and fever, together with subsequent skin infection and possible immunosuppression condition, indicated investigation for ESA.

The neurological symptoms of AEE are divided into four stages: (1) low back pain at the level of the affected spinal region, fever and local tenderness; (2) radicular pain, neck stiffness and altered reflexes; (3) motor weakness, sensory deficit and bladder and bowel dysfunction and (4) paralysis, with

possible permanent sequelae, rarely reversible after surgical approach^{4,6,9}. Our patient was in stage 3, due to the presence of neurogenic bladder, grade 4 paraparesis and persistence of back pain even with flexion/extension of the spine, characterizing a picture of bladder dysfunction, motor weakness and spinal stenosis due to an inflammatory process.

The ESA has a rapid progression, with evolution from radicular symptoms to neuromuscular weakness in around three to four days and from weakness to paraplegia in 24 hours. In children, the diagnosis is often delayed until neurological signs manifest, 75% of the time. It is important to consider the diagnosis of SEA in patients who have back pain, fever and spinal cord sensitivity, with or without an altered neurological examination, in order to prevent neurological sequelae, paralysis, sepsis and death^{4,8}.

The diagnosis is made by clinical suspicion, accompanied by an increase in ESR and CRP and neurological imaging showing the abscess², with all these elements present in the case.

Magnetic resonance imaging (MRI) with gadolinium contrast is the gold standard diagnostic approach for SEA, with 91% sensitivity and specificity, in addition to being relevant for follow-up^{1,3,6,12}. Intravenous contrast-enhanced tomography has very low sensitivity for the detection of SEA and should only be requested if MRI is not available³. The MRI requested for the patient was essential for diagnostic confirmation.

Treatment is traditionally based on surgical decompression and drainage, plus antibiotic therapy^{1,3,6}. Recent reports demonstrate that the use of antibiotics alone can produce satisfactory regression of the condition². Sugawara et al. (2019)³ recommend only clinical treatment, initially, in pediatric patients who do not have risk factors and who have been diagnosed before the onset of neurological symptoms, inferring that, for the patient, both surgical and clinical approaches were necessary.

Children have better resolution of the ESA, compared to adults, since, for them, the condition is aggravated by risk factors. In a study with a case series of 34 children with ESA, none evolved to death and only 18% had neurological sequelae¹¹, a fact that is in line with the good resolution of the patient's condition.

CONCLUSION

ESA is uncommon in pediatrics and requires early diagnosis and treatment in order to provide the patient with a better prognosis. The suspicion of SAA in pediatrics is extremely important in the face of fever, back pain and radicular symptoms. Being the gold standard method, MRI has the ability to reveal the extent of the lesion and confirms the clinical suspicion. The initiation of antibiotic therapy, complementary to surgical drainage, are safe and efficient approaches for the prevention of neurological sequelae. Therefore, the AEE should receive due attention and investigation in the face of indicative clinical signs.

REFERENCES

1. Sales JG, Tabrizi A, Elmi A, Soleimanpour J, Gavidel E. Adolescence spinal epidural abscess with neurological symptoms: case report, a lesson to be re-learned. *Med J Islam Repub Iran*. 2013 Feb;27(1):38-41.
2. Hawkins M, Bolton M. Pediatric spinal epidural abscess: a 9-year institutional review and review of the literature. *Pediatr*. 2013 Dez;132(6):e1680-e5.
3. Sugawara R, Kikkawa I, Watanabe H et al. Pediatric spinal epidural abscess: a case report of a 12-year-old girl without risk factors. *J Am Acad Orthop Surg Glob Res Rev*. 2019 Mar;3(3):e066.
4. Mantadakis E, Birbilis T, Michailidis L, Souftas V, Chatzimichael A. Spinal epidural abscess in a young girl without risk factors. *Eur J Pediatr*. 2011 Jul;170(7):945-8.
5. Pons M, Pérez L, Juárez F. Abscesso epidural espinal: caso clínico pediátrico. *Arch Argent Pediatr*. 2017;115(3):e146-e9.
6. Pathak A, Singh P, Gehlot P, Dhaneria M. Spinal epidural abscess treated with antibiotics alone. *BMJ Case Reports*. 2013 Abr;2013:bcr2013009285.
7. Aycan A, Aktas OY, Guzey FK. Rapidly progressive spontaneous spinal epidural abscess. *Case Rep Infect Dis*. 2016;2016:7958291.
8. Houston R, Gagliardo C, Vassallo S, Wynne PJ, Mazzola CA. Spinal epidural abscess in children: case report and review of the literature. *World Neurosurg*. 2019;126:453-60.
9. Vergori A, Cerase A, Migliorini L, Pluchino MG, Oliveri G, Arrigucci U, et al. Pediatric spinal epidural abscess in an immunocompetent host without risk factors: case report and review of the literature. *IDCases*. 2015;2(4):109-15.
10. Wiegele M, Marhofer P, Lönnqvist P. Caudal epidural blocks in paediatric patients: a review and practical considerations. *Br J Anaesth*. 2019 Abr;122(4):509-17.
11. Prasad M, De Vere N. Spinal epidural abscess masquerading as an acute abdomen. *Pediatr Neurol*. 2014 Mai;50(5):540-1.
12. Auletta JJ, John CC. Spinal epidural abscesses in children: a 15-year experience and review of the literature. *Clin Infect Dis*. 2001 Jan;32(1):9-16.