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Epidural abscess related to *Streptococcus mitis* in a 57-year-old immunocompetent patient

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SUMMARY

A 57-year-old immunocompetent male patient presented himself to our emergency department with lumbar pain for 10 days, after a lumbar torsion. He was neurologically intact, but showed signs of systemic inflammatory syndrome. A lumbar MRI found a spinal epidural abscess from L3-L4 to L5-S1 levels. The patient was operated early before occurrence of neurological deficit. The abscess cultures found a *Streptococcus mitis* infection. The patient made a good recovery after surgical decompression, washout with samples taken for cultures and targeted antibiotic therapy for 6 weeks.

BACKGROUND

Spinal epidural abscess, a collection of pus or inflammation between the thecal sac and surrounding tissue, is a rare condition in healthy adult patients, with an incidence of 2.4 cases per 100 000 persons.[1–3] Around half of the cases are due to a haematogenous spread, and almost a third because of a discitis spread.[4 5] The most frequent microorganism is *Staphylococcus aureus* in 50%–65% of cases, followed by Gram-negative bacilli such as *Escherichia coli* (18%) and *Pseudomonas* species in intravenous drug users.[1] Usually seen in adults aged more than 60 years, risk factors include immunodeficiency, HIV infection, malignancy, immunosuppressive treatments and intravenous drug abuse.[6] Adequate timely diagnosis of spinal epidural abscess is crucial because around one-fourth of patients may develop motor deficit or paralysis.[2]

We describe here the case of a healthy patient who presented a lumbar spinal epidural abscess related to a dental infection following lumbar torsion, without any risk factor.

CASE PRESENTATION

A 57-year-old male patient, wine-grower, known for heavy consumption of alcohol, otherwise healthy, presented to our emergency department after a 10-day duration of low back pain. The patient reported a lumbar torsion after a loss of balance on a rough ground 10 days ago, then a persistent and progressive lumbar pain. He reported slight fever a few days before, but no particular systemic symptoms. He mentioned an untreated dental pain of teeth 27 and 28.

The clinical assessment found a paravertebral painful muscular contracture of the lumbar spine. There was no neurological deficit of the lower extremities. The reflexes were normal and symmetrical. The Lasègue and Bragard manoeuvres were negative.

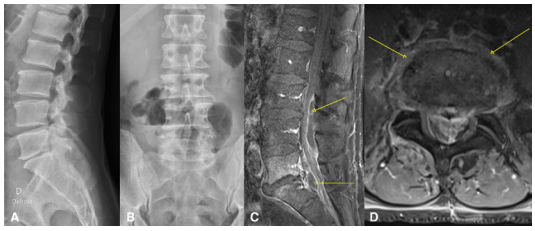

Figure 1 Preoperative lumbar imaging. (A, B) Radiographs showed only slight signs of degenerative disc disease at the L5-S1 level, and no inflammatory signs such as vertebral erosion. Lumbar MRI on T1-gadolinium sagittal sequences (C) and axial views at the admission (D), showing a spinal epidural abscess (arrows) with a severe stenosis, and a peripheral enhancement of the soft tissue around the L5-S1 level (arrows).

INVESTIGATIONS

Laboratory tests revealed a systemic inflammatory syndrome with an erythrocyte sedimentation rate of 60 mm/hour, a C-reactive protein (CRP) of 111 mg/L and a white cell count (WCC) of 23 G/L with 91% of segmented neutrophils. Blood cultures were collected. Lumbar radiographs showed only degenerative signs, and lumbar MRI found an epidural abscess posteriorly of the thecal sac at the L3-L4 and L4-L5 levels, and anteriorly at the L5-S1 level. There was also a L5-S1 discopathy with a suspected psoas abscess (figure 1). No percutaneous puncture was performed.

TREATMENT

The patient had emergency surgery on the day of admission. Using a posterior approach, a decompressive laminectomy in a right cross-over shape from L3 to S1 without any stabilisation. Two distinct collections were visualised and taken for microbiological studies (figure 2). The thecal sac looked free of compression at the end of the washout. The patient received intravenous amoxicillin-clavulanic acid 2.2 g three times per day until the microbiological results were available.

Abscess cultures revealed a multisensitive *Streptococcus mitis/oralis* in all positive samples (5/7). Blood cultures were positive for the same pathogen and became negative after 48 hours of antibiotic treatment. A fragment of ligamentum flavum was analysed and found nothing relevant, especially no inflammation at the histological study. In the context of initial bacteraemia and suspected haematogenous spread infection, a transoral echocardiography was performed and found no evidence for endocarditis. A BARD 5f picc-line was put in place in the left basilic vein for continuous intravenous antibiotic

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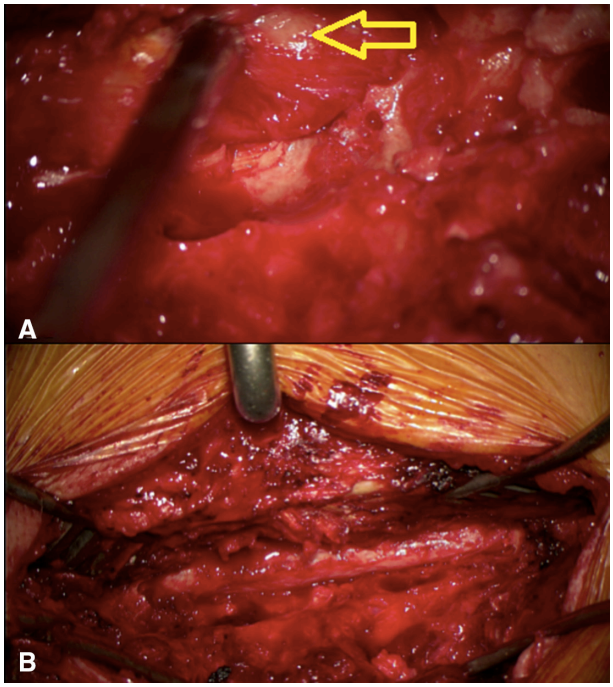

Figure 2 Intraoperative images of the spinal epidural abscess (arrow) after decompressive laminectomy (A). The abscess was immediately washed out for samples, and the dura mater was free of infectious material and was not affected (B).

treatment. Empiric antibiotic treatment was replaced by penicillin-G 5M of units four times per day for 10 days (table 1), with a minimum inhibitory concentration of 0.125 mg/L for penicillin.

OUTCOME AND FOLLOW-UP

The lumbar pain decreased and the patient presented no fever during his hospital stay. The CRP decreased from 256 mg/L at postoperative day 3 to day 47 at the last hospitalisation day as well as the WCC, which became normal at 4.7 G/L.

The patient was discharged from the hospital after 11 days, with the surgical wound healing well (figure 3). The antibiotic treatment was finally changed to intravenous ceftriaxone 2 g daily for the remaining 4 weeks in order to achieve a 6-week duration of antibiotics. The infected teeth were treated by surgical avulsion of the teeth 27 and 28. At a 6-week follow-up, the patient was asymptomatic and the CRP was 6 mg/L, with satisfactory wound healing. After 1 year, a lumbar MRI showed

Table 1 Susceptibilities of *Streptococcus mitis* found in abscess and blood cultures

Material from	Spinal epidural abscess
Direct examination (Gram)	Gram-positive cocci: +++
	Leucocytes: ++
	Red blood cells: ++++
Culture	*Streptococcus mitis/oralis*
	Penicillin-G: S
	Ampicillin: S
	Ceftriaxone: S
	Cefotaxime: S
	Erythromycin: S
	Clindamycin: S
	Vancomycin: S
	S=sensible, I=intermediate, R=resistant

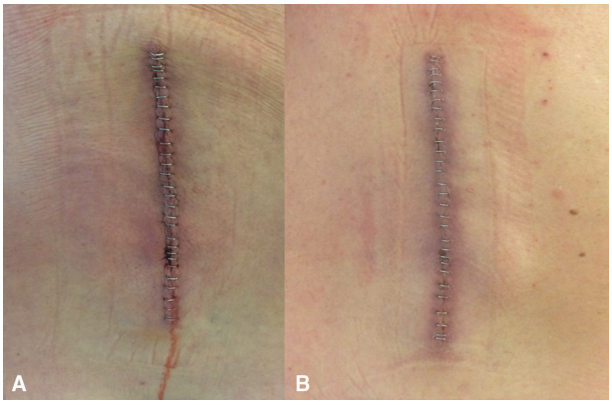

Figure 3 Appearance of the surgical wound. (A) Initially, a local peripheral redness and wound swelling were postoperatively present. (B) They progressively resolved with daily bandage changes; appearance after 10 days.

the same collapse of the L5-S1 but no sign of persistent or recurrent infection (figure 4).

DISCUSSION

To our knowledge, spinal epidural abscess related to *S. mitis* was rarely reported in the medical literature. Only 6.8% cases found in a review of Arko *et al* were caused by *Streptococcus* species.[7] Many of them are associated with healthy states but may be opportunistic pathogens.[8] They include *Streptococcus mitis*, *Streptococcus oralis* and *Streptococcus pneumoniae*. *S. mitis* can be found in oral biofilms and occasionally may cause systemic infections.[9] Its association with endocarditis and dental infections is well known.[10] Transoesophageal echocardiography is mandatory to rule out endocarditis.[11] In our case, the echocardiography excluded endocarditis. Other cases of skeletal infections due to *S. mitis* were reported in the medical literature. The most likely joint infected by *S. mitis* is the knee, in patients with poor dental hygiene, severe osteoarthritis and intravenous drug use.[10 12] Cariati *et al* described a thoracic spondylodiscitis in a patient with chronic sinusitis.[13] Feder and Gruson reported a case of glenohumeral infection,[14] Nomura *et al* reported an osteomyelitis of a lower extremity bone in a child.[15] Yusuf and colleagues[16] and Cinar *et al*[17] published cases of pelvic ring infections. Finally, another case

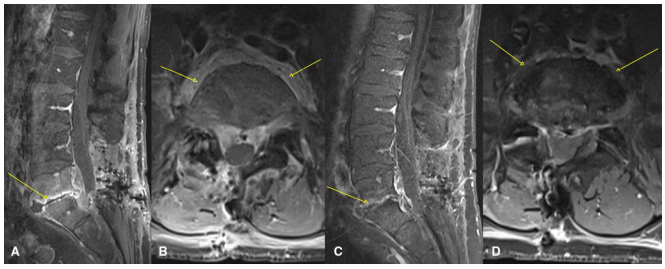

Figure 4 Postoperative lumbar MRI on T1-weighted gadolinium sequences. (A) At 6-week follow-up, demonstrating resolved infection and complete collapse of the L5-S1 disc (arrow). This collapses with peripheral inflammatory pannus (arrows). (B) Confirmed the spondylodiscitis diagnosis. (C) At 1-year follow-up, there was no sign of persistent or recurrent abscess, and the collapse of L5-S1 disc was stable. There was also no evidence of spondylolisthesis related to secondary instability. The peripheral inflammatory pannus of the soft tissues around the L5-S1 level resolved (D).

of spondylodiscitis related to *S. mitis* was reported by Prior-Español *et al*.[18] Cone and colleagues described four cases of endocarditis leading to spondylodiscitis,[19] with one related to *S. mitis*. They conclude that spondylodiscitis with spinal epidural abscess is more likely to occur with endocarditis due to a microorganism with pyogenic potential such as staphylococci, enterococci and streptococci, including *S. mitis*.

Only a few cases of spinal epidural abscess due to *S. mitis* have been published. In 1995, Martin and Lee[20] described a case about a C4-C5 anterior abscess in a 57-year-old haemophilic man. They emphasised the need for adequate microbiological diagnosis by sampling during the surgical procedure. Byrd and Nemeth described the case of a 57-year-old man with poor dentition and chronic alcohol abuse who presented a cauda equina syndrome related to an epidural abscess and a septic endocarditis with bacteraemia related to *S. mitis*.[21] All patients showed recovery after drainage and antibiotics like our patient.

Most of the authors recommend early decompressive surgery for epidural abscesses in case of occurrence of neurological deficit.[5] Here, the role of surgery is crucial to protect neurological function and to prevent irreversible severe deficits.[22] Besides, in the absence of CT-guided aspiration, specimens obtained during the surgery helped to define the pathogen and the most appropriate antibiotic treatment.

In the current case, the huge volume of the epidural masses and the extension in the spinal canal with severe stenosis, despite the absence of neurological deficit, encouraged us to perform a decompressive laminectomy. Ju *et al* recommend early surgical treatment for patients with severe spinal stenosis to prevent from motor deficit.[23] Most probably, our patient would have worsened without surgery. This was emphasised by the review of Tuchman and colleagues who conclude in favour of urgent surgical decompression for patients able to undergo surgery before an unpredictable progression in the disease may lead to a neurological impairment.[24]

Patient's perspective

I arrived at the emergency room of the clinic at about 3:15 p.m. following back pain for more than a week that was finally becoming unbearable, I was given medication that was not working. At around 4 p.m. I had an MRI scan and the first verdict was quickly confirmed by several specialists. This was followed by an emergency operation on an epidural abscess of several centimetres carried out by the senior and junior surgeons. The treatment by the operating theatre and the anaesthesiologist was carried out perfectly and with great professionalism. The operation lasted a little more than two hours and the awakening took place at the Intensive care unit around 11:00 p.m. in a gentle manner despite the importance of the operation.

Learning points

- Dental infections may result in endocarditis or spinal epidural abscess.
- Infections may settle in tissues damaged by trauma during a bacteraemia.
- Early decompression prevented neurological impairment and the cultures collected helped in a prompt bacteriological diagnosis and appropriate treatment.

After a decompressive laminectomy, the lumbar spine may become unstable, requiring instrumentation, especially for a decompression of more than two-disc levels.[25 26] The choice of the right cross-over multilevel laminectomy without instrumentation seemed to be an efficient technique in order to avoid destabilisation of the vertebral column, with decompression wide enough to completely wash out the abscess. Furthermore, after 1 year, lumbar MRI showed no sign of spine instability (figure 4).

Studies reporting a link between vertebral blunt trauma and spinal epidural abscess formation are rare. Baker *et al* reported 12 out of 39 cases of blunt trauma such as heavy lifting or a fall.[27] Heusner reported 4 out of 20 cases of spinal epidural abscess related to trauma.[28] Finally, Hulme and colleagues described only 1 case among 10,[29] and the literature review from Reihsaus *et al* reported trauma in 25%–34.7% of cases of spinal epidural abscess,[22] including direct inoculation by spinal puncture,[30] without mention of torsion trauma reported. In the present case, we think that, considering a pain-free period before the lumbar torsion of the patient, an insidious onset of L5-S1 spondylodiscitis was related to *S. mitis* spreading from dental caries infecting tissues damaged during the torsion, leading to abscess formation. The final collapse of the L5-S1 disc on lumbar MRI at the 6-week follow-up favours this hypothesis (figure 4).

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