

# Spontaneous Septic Arthritis of the Lumbar Facet Caused by Methicillin-Resistant *Staphylococcus aureus* in an Otherwise Healthy Adolescent

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## Abstract

We report the case of a 16-year-old boy with isolated septic arthritis of a lumbar facet. This rare presentation of an infection in a lumbar facet joint occurred after minor trauma sustained in a football game.

Septic arthritis of the spinal facet joint is an uncommon phenomenon. Only 5 cases have been reported in immunocompromised pediatric patients. To our knowledge, no case of septic arthritis in an immunocompetent pediatric patient has been reported. An otherwise healthy 16-year-old boy presented with 4 weeks of escalating back pain after a minor athletics-related trauma. Evaluation showed incapacitating pain, lumbar musculature spasms, and the absence of fever, hemodynamic, or neurologic changes. Laboratory values were within normal limits. Magnetic resonance images showed a fluid collection within the L3-L4 facet and a localized abscess. Computed tomographic-guided aspiration showed methicillin-resistant *Staphylococcus aureus* infection, for which the patient received 6 weeks of vancomycin with complete resolution of symptoms. Refractory lumbago in an adolescent requires careful evaluation.

Septic arthritis of the lumbar facet joint is an uncommon phenomenon: about 100 cases have been reported in the literature, only 5 of which involved children. Hematogenous spread from an existing infection elsewhere in the body is the most common pathologic mechanism by which a facet joint is contaminated. In addition, infections can spread locally (eg, direct joint inoculation from an adjacent pyogenic source). The average age of patients who develop septic facet arthritis is 55 years, with more than 95% of reported cases occurring in the lumbar spine.<sup>1</sup> Up to 38% of patients develop severe

neurologic deficit.<sup>1</sup> Diagnosis is confirmed by a combination of imaging, laboratory studies, and arthrocentesis (or open culture) with staining and culture of specimens. Management options include antibiotic administration with or without open debridement.<sup>1</sup>

This report describes an adolescent who presented with severe nonradicular lower back pain after an athletic injury and who developed an otherwise asymptomatic septic arthritis of the L3-L4 facet. This case also highlights the importance of a thorough history and examination, a discerning use of adjunctive studies, and proficiency in differential diagnostics and clinical knowledge. The patient and his guardian provided written informed consent for print and electronic publication of this case report.

## Case Report

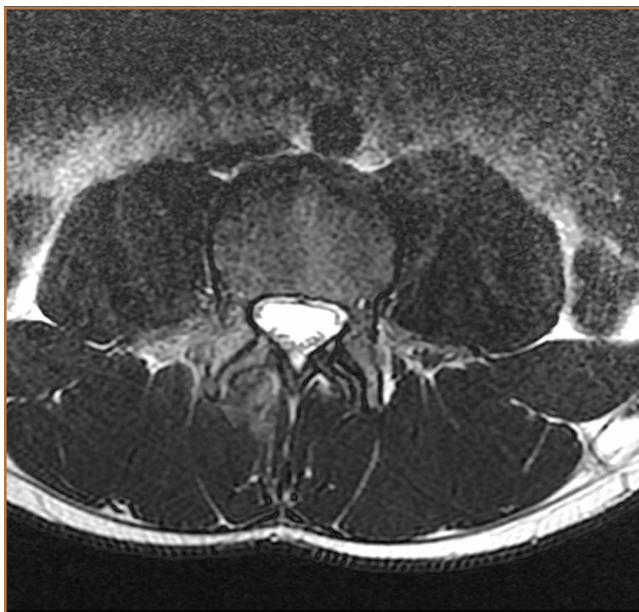
A 16-year-old boy with no significant medical history presented with persistently debilitating low back pain and spasm. The patient was a high school football player who had sustained a blunt tackling injury 1 month earlier. For the first 2 weeks after the injury, the patient experienced marked pain, described as focal right paraspinal lumbar pain without radiation. The patient denied fever, dysuria, paresthesias, bowel or bladder retention or incontinence, or other constitutional symptoms. The patient had no history of sexually transmitted infections. The patient denied smoking, sick or unusual exposures, or intravenous (IV) drug use, including performance-enhancing and recreational drugs. Prior to evaluation by the spine service, the patient had failed treatment with nonsteroidal anti-inflammatory drugs, narcotic opioid analgesics, and antispasmodics.

On physical examination, the patient was in obvious discomfort with an antalgic gait that favored his right side. His skin showed no obvious lesions, rashes, or regions of swelling or fluctuance. Neurologically, the patient had mild weakness with right-knee extension (4/5 graded motor strength) but was otherwise neurologically intact in his bilateral lower extremities. His abdomen was soft without tenderness or palpable masses. Rectal examination showed normal rectal tone. Plain

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**Figure 1.** Axial T2-weighted magnetic resonance imaging (MRI) of the lumbar spine shows inflammatory changes in and around the right L3-L4 facet joint.



**Figure 2.** Axial T2-weighted magnetic resonance imaging (MRI) following 4 weeks of IV antibiotic therapy. The right L3-L4 facet joint shows resolution of facet inflammation, joint expansion, and surrounding edema, and an absence of adjacent enhancing collections.

radiographs of the lumbar spine, involving anteroposterior, lateral, and coned-down views of the lumbosacral junction, were negative for obvious pathology with the exception of a mild loss of lumbar lordosis.

The patient was placed in a lumbar orthosis and given medi-

cation for pain and spasm control. Because of the degree of pain and disability, the patient's relative young age, and the failure of conservative treatment, we obtained magnetic resonance imaging (MRI) with IV contrast to evaluate for occult pathology; the MRI showed an isolated T2-weighted hyperintensity in the right L3-L4 facet joint (Figure 1). The facet joint space was mildly widened with loss of osteochondral bone. We observed moderate stenosis of the right neural foramina with right paraspinous soft-tissue edema spreading from the right transverse process of L3 into the psoas muscle.

The patient was admitted to the hospital, and he was afebrile on admission. Laboratory studies showed a white blood cell count of  $7.2 \times 10^9/L$  (normal:  $4.3\text{-}10.0 \times 10^9/L$ ) with normal differential, erythrocyte sedimentation rate (ESR) of 12 mm/h (normal: 6-12 mm/h), and C-reactive protein (CRP) of 1.5 mg/L (normal < 6 mg/L). Two blood cultures remained negative at 2 weeks. Computed tomographic-guided aspiration of the facet joint yielded 2+ polymorphonuclear leukocytes and rare clusters of gram-positive cocci. Pediatric infectious disease specialists recommended empiric treatment with vancomycin. Final reported culture growth from the facet joint aspiration showed methicillin-resistant *Staphylococcus aureus* (MRSA). A peripherally inserted central catheter was placed, and the patient completed 6 weeks of IV vancomycin. A transthoracic echocardiogram was negative for valvular vegetation or damage. At no time during the patient's hospitalization did he exhibit fever, leukocytosis, or positive inflammatory markers. Two weeks after discharge, the patient's lumbago completely resolved. He remained afebrile, and follow-up laboratory studies were within normal limits. An MRI 1 month after hospitalization showed resolution of facet inflammation and surrounding edema and an absence of additional enhancing collections (Figure 2). Two years later, the patient is without evidence of residual deficit.

### Discussion

Septic arthritis of the facet joint is uncommonly reported in the literature. Of fewer than 100 cases, only 5 were pediatric patients. In all cases, patients presented with a clinical prodrome of constitutional symptoms and positive inflammatory laboratory studies.<sup>2,3</sup> *S aureus* has been implicated in up to 80% of facet joint infections.<sup>4</sup> To our knowledge, this is the only case of a MRSA facet-joint infection in a patient without any clinical or laboratory evidence of systematic inflammation. The typical clinical presentation of septic arthritis in the facet joint is similar to that of other spinal infections. Patients present with fever, malaise, weight loss, night sweats, and complaints of localized and/or radicular back pain. The true incidence of facet infection may be underreported, secondary to its propensity to be misdiagnosed or undiagnosed. Septic facet joints typically present with unilateral involvement, unlike other pyogenic spinal infections (eg, discitis, epidural abscess).<sup>1,5</sup> Severe neurologic symptoms occur in 9% to 38% of patients with facet infections.<sup>1</sup>

Laboratory findings typically include elevated ESR and CRP level and leukocytosis. The patient in this case report exempli-

fied the potential atypical presentation of facet infection.<sup>6</sup> In the pediatric population, the absence of laboratory findings should not exclude infection as an etiology of lumbago.

Both imaging and culturing the acquired joint fluid samples must be performed to establish the diagnosis of facet septic arthritis. An MRI may allow early detection of the disease and can rule out alternate diagnoses, such as discitis, epidural abscesses, psoas abscesses, and trauma, among others. Magnetic resonance imaging is the test of choice for cases like this (ie, when a patient has failed conservative measures and continues to experience debilitating symptoms). An MRI is both sensitive and specific for diagnosing facet-joint infections as early as 2 days after the onset of symptoms.<sup>1,7</sup>

Characteristic MRI findings in facet infections and spondylodiscitis are high signal intensity T2-weighted images as shown in **Figures 1 and 2**. Contrast media may enhance the appearance of subchondral bone and the vertebral disc, and reveal hypertrophy of the synovium in the facet joint. The addition of contrast should be considered in patients who do not have contraindications to its administration.<sup>8</sup> Scintigraphy and single-photon emission computed tomography can also be useful in diagnostic evaluation.<sup>9</sup> If a large abscess is present, percutaneous or open drainage may be required.<sup>2</sup> Duration of antibiotic treatment has been reported of 6 to 10 weeks, but there is no consensus on optimal duration of therapy.<sup>2</sup>

It is unclear why this patient had low inflammatory markers and was afebrile. It may be that the slow, indolent nature in the manifestation of symptoms and the patient's good health prevented a robust systemic inflammatory response. Because MRSA is an evolving bacterium, its involvement in atypical presentations in the pediatric population should be considered.

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## References

- Muffoletto AJ, Ketonen LM, Mader JT, Crow WN, Hadjipavlou AG. Hematogenous pyogenic facet joint infection. *Spine (Phila Pa 1976)*. 2001;26(14):1570-1576.
- Krishnan V, Amritanand R, Sundararaj GD. Methicillin-resistant *Staphylococcus aureus* as a cause of lumbar facet joint septic arthritis: a report of two cases. *J Bone Joint Surg Am.* 2010;92(2):465-468.
- Mas-Atance J, Gil-García MI, Jover-Sáenz A, et al. Septic arthritis of a posterior lumbar facet joint in an infant: a case report. *Spine (Phila Pa 1976)*. 2009;34(13):E465-E468. doi: 10.1097/BRS.0b013e3181a4e64b.
- Rombauts PA, Linden PM, Buyse AJ, Snoecx MP, Lysens RJ, Gryspeerdt SS. Septic arthritis of a lumbar facet joint caused by *Staphylococcus aureus*. *Spine (Phila Pa 1976)*. 2000;25(13):1736-1738.
- Dauwe DM, Van Oyen JJ, Samson IR, Hoogmartens MJ. Septic arthritis of a lumbar facet joint and a sternoclavicular joint. *Spine (Phila Pa 1976)*. 1995;20(11):1304-1306.
- Halpin DS, Gibson RD. Septic arthritis of a lumbar facet joint. *J Bone Joint Surg Br.* 1987;69(3):457-459.
- Baltz MS, Tate DE, Glaser JA. Lumbar facet joint infection associated with epidural and paraspinal abscess. *Clin Orthop.* 1997;(339):109-112.
- Sans N, Faruch M, Lapèque F, Ponsot A, Chiavassa H, Railhac JJ. Infections of the spinal column--spondylodiscitis. *Diagn Interv Imaging.* 2012;93(6):520-529.
- Scharf S. SPECT/CT imaging in general orthopedic practice. *Semin Nucl Med.* 2009;39(5):293-307.

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*This paper will be judged for the Resident Writer's Award.*

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