

Prompt recognition of a rare type of infectious arthritis

Most clinicians have never seen this type of infectious arthritis. Fortunately, this patient received a rapid diagnosis and ultimately underwent successful treatment.

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CASE

A 50-year-old female presented to the Intermountain Spine Institute with a complaint of severe back, right flank, and right thigh pain of approximately 2 months duration. She denied a history of injury or other inciting incident. She had been evaluated twice previously by a local emergency department (ED) physician. On her second ED visit, lumbar MRI without contrast was performed, and a bulging or herniated disk was noted at L5-S1.

In our office, the patient was afebrile but in obvious distress, with a pain score of 8 out of 10 on the Visual Analog Scale (VAS). She stood in a forward flexed position and stated that she was unable to stand erect because of the pain in her right flank. She was exquisitely tender to palpation over the right flank and extending into the right posterior superior iliac crest. Femoral stretch testing elicited thigh pain. Flexion, abduction, and external rotation testing of the hips elicited her usual back and thigh pain, as well as producing crepitus in the right flank. Neurologic and manual muscle testing revealed no abnormalities beyond pain during any range of motion activity.

An anteroposterior standing pelvis radiograph obtained on the initial visit revealed increased sclerosis of the right sacroiliac joint. Review of the noncontrast MRI obtained in the ED revealed a broad-based central disk protrusion at L5-S1 that appeared to abut the traversing right S1 nerve root. An area of asymmetry near the right medial psoas at L4-5 was accompanied by high signal, indicating edema or inflammation; however, no frank fluid was noted (see Figure 1). The differential diagnosis at this point included sacroiliitis, atypical or pathologic fracture, and psoas abscess.

Laboratory testing and a 3-phase technetium-99 and single photon-emission computed tomography bone scan were ordered during the initial visit (see Figure 2, page 28). The WBC count was 12,000 cells/ μ L with 71% polymorphic neutrophils; the ESR measured using the Westergren method was 42 mm/h; and the C-reactive protein (CRP) level was 4.6 mg/dL. The bone scan revealed increased

radiotracer uptake on the right at L4-5, centered in the facet. The radiologist felt this finding to be most compatible with degenerative facet disease.

After consultation with the neuroradiologist, a decision was made to proceed with contrast-enhanced CT of the pelvis and abdomen. The abdominal CT revealed abnormal enhancement of the right L4-5 facet joint with extension into the paraspinous musculature and ligamentum flavum, without frank fluid or abscess (see Figure 3, page 28). The psoas was slightly enlarged on the right, but no evidence of infectious involvement was noted.

A diagnosis of presumed septic facet joint arthritis (SFJA) was made, and a CT-guided biopsy of the right L4-5 facet joint was immediately undertaken. No fluid was aspirated, but samples of the synovial capsule and the articular surface were obtained. The biopsy sample cultured positive for methicillin-sensitive *Staphylococcus aureus*. Aerobic, anaerobic, fungal, and mycobacterial blood cultures were collected, the results of all of which were normal.

Once the biopsy was complete and blood cultures obtained, the patient was started on vancomycin (Vancocin)

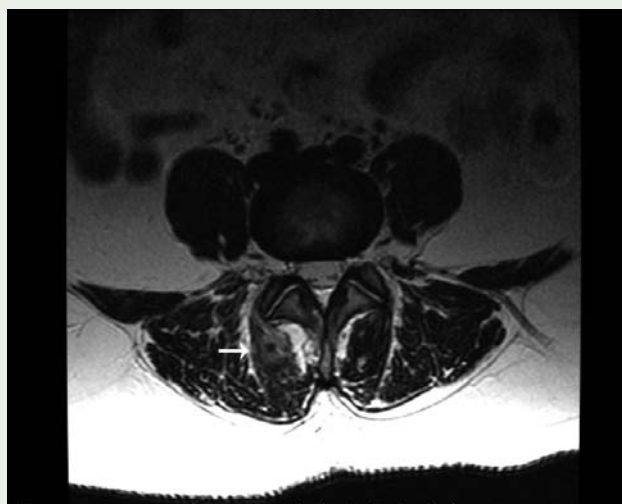


FIGURE 1. Axial MRI image of L4-5 reveals paraspinous edema (arrow).

via central line. After confirmation of the pathogen, the vancomycin was continued for a total of 5 weeks, based on the results of follow-up WBC, ESR, and CRP values. This was followed by a 6-week course of oral levofloxacin (Levaquin).

A thorough workup was undertaken to determine a remote primary infection site. The patient's nasal culture grew 3+ methicillin-sensitive *S aureus*. The only other positive finding was a benign heart murmur without evidence of endocarditis.

The patient noted significant improvement in her symptoms within 7 days of beginning antibiotic treatment. Except for the CRP level, the laboratory values normalized 18 days after institution of antibiotics. At the 45-day follow-up, the patient noted 1 out of 10 pain on the VAS, and the physical examination was normal. The CRP level was 0.8 mg/dL, and her only functional limitation was mild pain after prolonged sitting.

This case varied in some important respects from previous published reports of SFJA. The patient was afebrile during the entire episode. There was no frank abscess or fluid collection in the joint. Although markers of infection were present in the laboratory results and the biopsy result was positive for bacteria, the blood cultures were negative despite the rather prolonged duration of the patient's symptoms compared to other reports. MRI, usually considered highly diagnostic in as little as 2 days,¹ was not as helpful as expected in establishing the diagnosis.

DISCUSSION

SFJA is a rare entity and its incidence in the general population is unknown, but recognition of this condition seems to be increasing. In 2001, a total of 27 cases had been reported in the literature;¹ by 2002, the number of reported cases had reached 40.² There has been speculation that the problem may be underreported because clinicians are so unfamiliar with it.² SFJA occurs most often in mature adults (average age, 60 years), although pediatric cases are infrequently seen.

Etiology The cause of SFJA is unclear in many cases. Positive blood cultures are common, and facet infections without diskitis or other accompanying infections lead some authors

to postulate hematogenous spread as a cause.¹ Immunocompromised patients are at increased risk for isolated SFJA.² Halprin and Gibson, in an early report, postulated that hemarthrosis in the facet joint from back strain could cause bacterial colonization.³ Iatrogenic SFJA has been reported as arising from acupuncture^{4,5} and spinal injection procedures,⁶ as well as from spinal surgery.¹

Clinical presentation SFJA manifests similarly to many more common spine-related ailments, including mechanical back pain, diskitis, and sciatica.^{1,2} Signs and symptoms similar to those of pyelonephritis⁷ have also been reported. The variable presentation and lack of clear clinical signs can complicate or delay the accurate diagnosis of SFJA.

“Gadolinium-enhanced MRI is now considered to be the best modality to diagnose cases of early septic facet joint arthritis.”

Generally, the patient presents in acute discomfort, possibly with stiffness, limited range of spinal motion, and variable fever. Lumbar extension or rotation usually increases pain. Lumbar fullness or mass are commonly reported.^{1,2} Pain may radiate to the flank, buttock, and thigh. A key component of the clinical examination that should raise suspicion is failure of the pain to abate with rest or inactivity. Neurologic symptoms may be present, especially if epidural abscess has occurred. Cauda equina syndrome secondary to epidural abscess has been reported.⁸

Laboratory data SFJA produces variable elevations in leukocyte counts with increased polymorphic neutrophils. The ESR and CRP level are virtually always elevated.^{1,2,4} *S aureus* is the most common causative pathogen identified, but other pathogens, including *Enterococcus faecalis*,¹ *Pseudomonas pyocyanea*,⁹ and *Bacteroides* species,¹⁰ have occasionally been cultured. The reliability of blood and tissue cultures varies among reports, but cultures are positive 95% of the time. Some authors have suggested using direct aspiration

TEACHING POINTS

- Septic facet joint arthritis (SFJA) is a rare entity whose cause is unclear in many cases.
- SFJA manifests similarly to many more common spine-related ailments, including mechanical back pain, diskitis, and sciatica. The variable presentation and lack of clear clinical signs can complicate or delay accurate diagnosis. A key component of the clinical examination that should raise suspicion is failure of the pain to abate with rest or inactivity.
- SFJA produces variable elevations in leukocyte counts with increased polymorphic neutrophils. The ESR and CRP level are virtually always elevated. *Staphylococcus aureus* is the most common causative pathogen identified.
- Gadolinium-enhanced MRI is now considered to be the best modality to diagnose early SFJA.
- The most common treatment is a course of intravenous and oral antibiotics similar to what is used for diskitis.

COMPETENCIES

●●●● Medical knowledge

● Interpersonal & communication skills

● Patient care

● Professionalism

●●●● Practice-based learning and improvement

● Systems-based practice

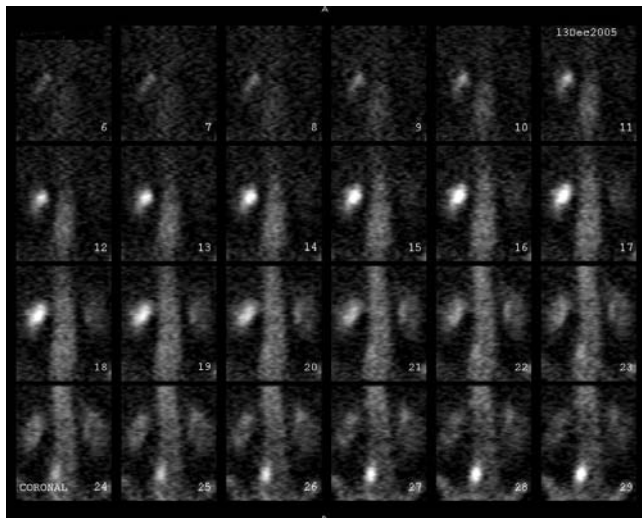


FIGURE 2. A coronal SPECT sequence shows increased uptake at the right L4-5 facet (images 22-29).

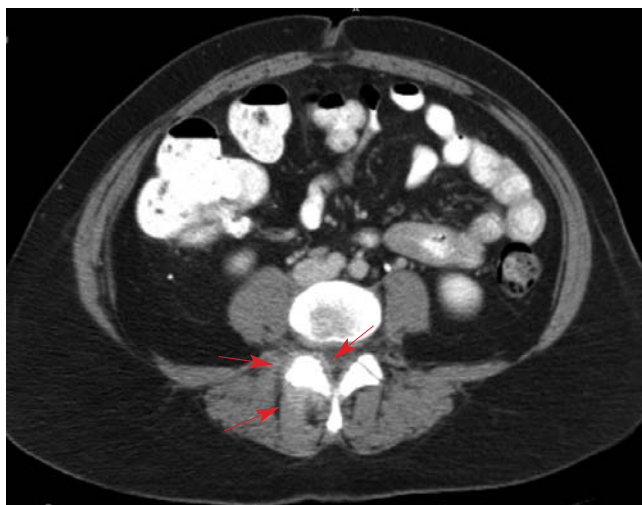


FIGURE 3. Contrast-enhanced CT demonstrates joint, paraspinal, and ligamentum flavum enhancement at the right L4-5 facet joint (arrows).

only if blood cultures are inconclusive,² but the majority currently recommend gathering both blood and tissue cultures. In our patient, both blood culture and direct aspiration were performed. Despite negative blood cultures, a rapid and accurate diagnosis was obtained using early tissue biopsy.

Imaging Gadolinium-enhanced MRI is now considered to be the best modality to diagnose early SFJA because of its sensitivity for soft tissue.^{1,2} CT has also been shown to be useful in early diagnosis, and contrast-enhanced CT is highly specific in determining abscess in surrounding soft tissue.^{1,2,7} Plain radiographs are of little value initially because they do not show soft tissue. Destructive changes apparent on radiographs tend to occur late in the progression of SFJA.^{1,2,7}

In this case, contrast-enhanced CT was utilized rather than contrast-enhanced MRI because of CT's immediate availability and because of our suspicion that CT-guided biopsy would be necessary for rapid diagnosis. The lack of sensitivity of the original noncontrast MRI was also a factor in choosing CT.

Treatment There is no generally agreed upon therapy for SFJA and no formalized antibiotic treatment protocol. Some experts believe that SFJA may resolve spontaneously.^{1,2} The most common treatment is a course of intravenous and oral antibiotics similar to what is used for diskitis. Initial broad-spectrum antistaphylococcal antibiotics are instituted immediately after blood culture and/or biopsy results are obtained. Once the specific pathogen is identified, the antibiotic treatment is tailored as necessary. IV therapy may last as little as 2 weeks followed by a minimum of 4 weeks of oral therapy.² Some authors advocate more aggressive intervention, such as percutaneous drainage of abscesses along with antibiotic therapy.¹ Epidural abscess, failure of percutaneous drainage, or failure of antibiotic therapy are indications for open drainage and debridement.^{1,7} A thorough workup to uncover or rule out a primary infection site is imperative. In presentations where an isolated facet joint infection is found, evaluation of immune status is important.

In our patient, the treatment phase was managed in concert with an infectious disease specialist. IV therapy was tailored to the laboratory values, resulting in a 5-week course of IV treatment followed by 6 weeks of oral antibiotic treatment. Biopsy revealed a paucity of frank fluid in the joint, and no free fluid was seen in the surrounding tissue on either MRI or CT, so drainage was unnecessary. No evidence of a primary infection site or immunocompromise was found. Nasal cultures suggest the possible primary source of the pathogen, but no direct link to the affected joint was ever discovered. **JAAPA**

Brad Davis practices at the Intermountain Spine Institute, Salt Lake City, Utah. He has indicated no relationships to disclose relating to the content of this article.

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