

Case Report

Septic Facet Joint Arthritis after a Corticosteroid Facet Injection

Toby N. Weingarten, MD,* W. Michael Hooten, MD,* and Marc A. Huntoon, MD*

*Department of Anesthesiology, Mayo Clinic College of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota, USA

ABSTRACT

Lumbar facet joint injections are commonly employed in the treatment of low back pain and are considered to be relatively safe with few known complications. We report the case of septic facet arthritis following a periarticular facet injection in a patient with recurrent urinary tract infections. The literature is reviewed to identify epidemiological and clinical features of patients in whom septic facet arthritis developed after lumbar facet injection. The diagnosis of iatrogenic septic facet arthritis is often delayed because neurologic and constitutional signs and symptoms develop slowly. Serologic nonspecific markers of infection and appropriate imaging studies may be more sensitive for the early diagnosis of septic facet arthritis. Recalcitrant or worsening back pain after facet injections should prompt an investigation to rule out infectious causes.

Key Words. Facet Joint; Injection; Abscess; Complication

Introduction

Lumbar facet (i.e., zygapophysial joints) injections are frequently employed in the management of chronic low back pain. A study of the Medicare population showed the number of lumbar facet injections, perifacet injections, and medial branch blocks was more than 94,000 in 1999 [1]. Septic arthritis after a lumbar facet injection is exceedingly rare. A recent review of 116 fluoroscopically guided radiofrequency denervation procedures of the lumbar facet joints in a 5-year period at a major tertiary facility revealed no infectious complications [2]. A retrospective review of 4,767 spinal anesthetics in a 3-year period at the Mayo Clinic found only two infectious complications [3]. As lumbar facet injections

continue to increase, pain medicine specialists and physicians caring for patients treated with lumbar facet injections must become aware of the potential infectious complications of this procedure [1]. We report the occurrence of septic facet arthritis following a perifacet injection for treatment of chronic lumbar back pain.

Case Report

A 53-year-old woman was referred to the Mayo Clinic Interventional Pain Clinic for evaluation of worsening low back pain following facet joint injections. Past medical history was remarkable for a 5-year history of urinary retention and recurrent urinary tract infections. She self-catheterized 2–4 times daily and intermittently required suppressive antibiotics. The patient had known lumbar facet joint arthropathy previously treated with multiple lumbar intra-articular facet joint injections, and a lumbar spine radiofrequency neurotomy performed 3 years prior. A three-phase technetium-99 m methylene-diphosphonate scintigraphy obtained to assess for degenerative changes in the left thumb also revealed degenerative

Reprint requests to: Toby N. Weingarten, MD, Mayo Clinic College of Medicine, Department of Anesthesiology, Mayo Clinic, 200 First Street, S.W., Rochester, MN 55905, USA. Tel: 507-255-1612; Fax: 507-255-6463; E-mail: weingarten.toby@mayo.edu.

Support: Support for this study provided from the Department of Anesthesiology, Mayo Clinic, Rochester, MN.

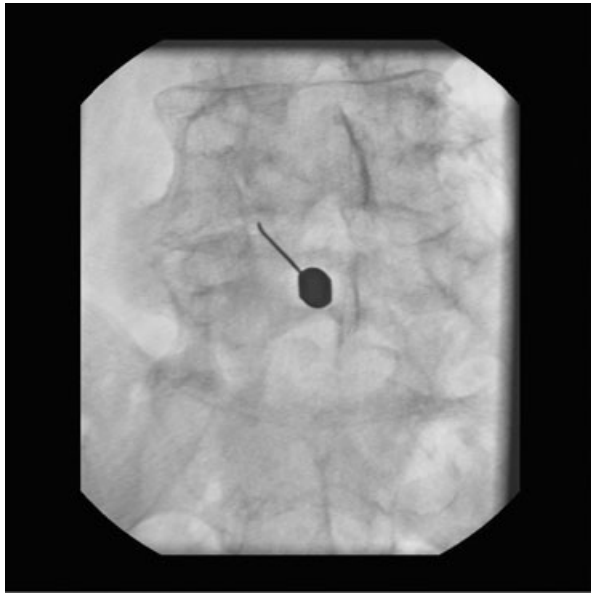


Figure 1 Periarthral injection of the left L4/5 facet joint.

changes in the bilateral L4-L5 facets. This scan was obtained before the latest injection.

Sixteen days before presentation, the patient underwent fluoroscopically guided bilateral L4-L5 facet joint injections. Skin preparation was performed with Povidone-iodine solution, and sterile technique was observed throughout the procedure. A 22-gauge Quincke needle was successfully positioned in the right intra-articular space as verified by contrast medium. Triamcinolone 40 mg in 0.5 mL bupivacaine 0.25% was injected. The left intra-articular space could not be entered, and a periarthral injection was performed using triamcinolone 50 mg in 0.6 mL bupivacaine 0.25% (Figure 1). Following the procedure, the patient had 3 days of reduced pain after which she began experiencing non-radicular left-sided low back pain. Three weeks after the procedure she was evaluated in a community emergency department (ED) for progressive back pain. She was afebrile but the erythrocyte sedimentation rate (ESR) was 60 millimeters per hour. Further diagnostic testing was not performed, and she was dismissed from the ED with recommendations to follow-up with her spine care specialist. The patient obtained a spine specialty evaluation and was referred to our pain medicine clinic for a left L4-L5 medial branch block.

Upon presentation, the patient described the left low back pain as the worst she had ever experienced, and she reported associated nocturnal chills and diaphoresis. Generalized left leg weak-

ness was reported necessitating the use of a cane, but she denied focal motor or sensory deficits. On physical examination, the patient was afebrile but the left lumbar region was tender to palpation. There was no skin erythema or increased warmth, and the neurological examination was nonfocal. A lumbar spine magnetic resonance imaging (MRI) scan, with and without gadolinium contrast, demonstrated an abscess involving the left L2-L3 with extension to the L3-L4 facet joint, the left paraspinous musculature, left psoas muscle, and the epidural space (Figures 2 and 3). The patient was hospitalized and urine culture was positive for *Escherichia coli*. A computed tomographic (CT) scan-guided aspiration of the fluid collection at L2-L3 revealed serosanguineous fluid, but the culture revealed no growth. The patient underwent a left L2 hemilaminectomy, resection of the left L2/3 facet joint, and drainage of the abscess. Antibiotic therapy, which consisted of a 6-week course of intravenous vancomycin and ertapenem, was withheld until after abscess drainage. Purulent material from the abscess and blood cultures failed to grow an organism despite incubation for 60 days. At a 6-month follow-up, the patient has residual back pain but no neurologic deficits.

Discussion

This is the first case report of the development of septic facet arthritis following a facet injection at

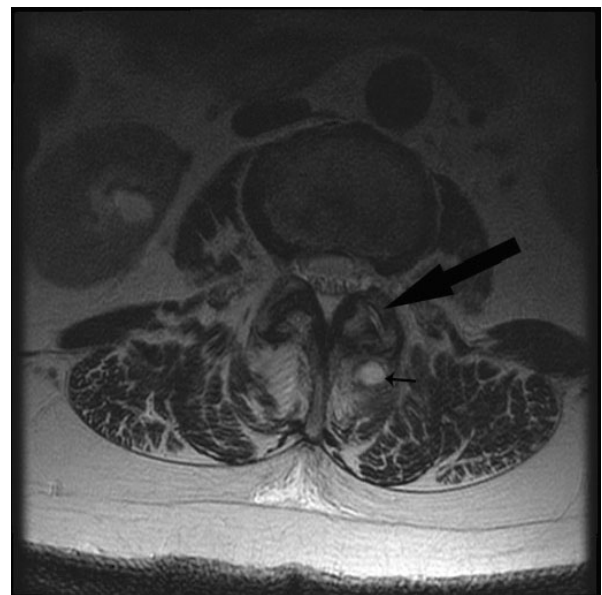


Figure 2 T2 weighted magnetic resonance imaging axial view of L2/3 facet. Large arrow points to the left L2/3 facet joint. Small arrow points to paraspinal abscess material.

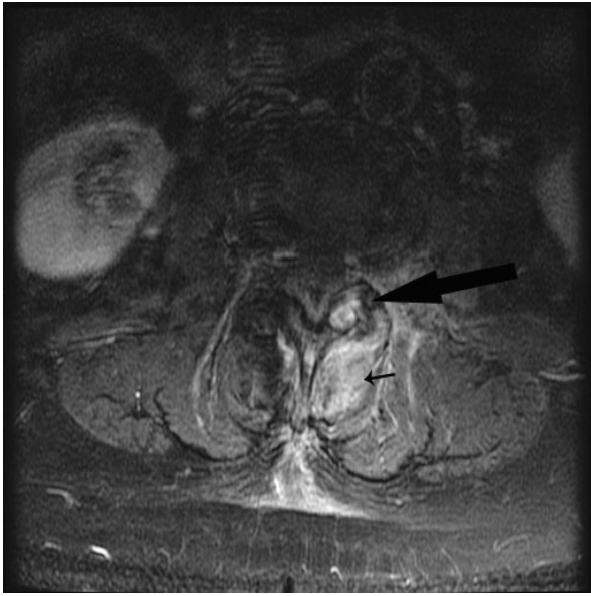


Figure 3 T1 fat-suppressed gadolinium enhanced magnetic resonance imaging axial view of L2/3 facet. Large arrow points to abscess involvement of the left L2/3 facet. Small arrow points to inflammatory changes in the paraspinal musculature.

a different level, and the fifth reported infectious complication after a facet joint injection with corticosteroids. We reviewed the literature to identify predisposing epidemiological and clinical features of patients in whom septic facet arthritis developed after lumbar facet injection. Our goal was to compare and contrast the findings in the reported cases with the clinical course of our patient. MEDLINE and EMBASE literature searches revealed three reports of infectious complications following a lumbar facet injection, one case of a paraspinal abscess [4], one case of an epidural abscess [5], and one case of septic arthritis of the lumbar facet [6]. The literature searches revealed a fourth report of a paraspinal abscess developing after an injection of the left iliolumbar angle [7].

Our patient's presenting symptoms included worsening low back pain without radicular features, paraspinal tenderness, and systemic constitutional symptoms. A common feature in all four cases was an increase in low back pain following injections, but only one case reported paraspinal tenderness [4], and only one case reported systemic symptoms suggestive of an infection [7]. Three of the four cases reported associated thigh and buttock pain [4–6], whereas our patient complained primarily of back pain. The time from injection to symptom onset was 2 to 35 days in the case series, and our patient developed symptoms

in 3 days following the injection. As in our patient, there was a delay in diagnosis in three of the cases. In the report by Cook et al., the patient was hospitalized 9 days following the injection for worsening back pain. A technetium-99 m scintigraphy and CT scan failed to demonstrate an infection and the patient was dismissed. One week later, an ESR was prolonged, a gallium-67 bone scintigraphy demonstrated increased uptake in the posterior lower lumbar spine and right sacroiliac region, and an MRI scan demonstrated a paraspinal abscess with epidural spread. This patient only developed neurologic deficits (loss of patellar reflex and quadriceps muscle weakness) and fever hours prior to undergoing surgery. The neurologic deficits were reversed following surgical drainage of the abscess [4]. In the report by Alcock et al., the patient was hospitalized 12 days after the lumbar facet injection. Two days later, urinary retention, lower extremity weakness, and sensory loss developed, which prompted an MRI that demonstrated an epidural abscess. The patient did not have a full neurologic recovery despite aggressive surgical intervention [5]. In the report by Orpen et al., an MRI was obtained 2 weeks after symptom onset, which demonstrated a septic facet joint with epidural involvement. This patient made a full recovery after surgery [6]. In our patient, an MRI was not obtained until her third clinical evaluation. As in our patient, the three cases that had epidural involvement required surgical intervention to drain the abscess. Only the patient reported by Magee et al. responded solely to intravenous antibiotics, but full details of the clinical course in that patient were not provided [7].

Blood or abscess cultures grew staphylococcus species in all four case reports. Blood and abscess cultures failed to grow a causative organism in our patient despite withholding antibiotics until after specimens were collected and holding cultures for 60 days. Therefore, it is unclear if her infection was secondary to skin flora, urinary tract infection, or another source. We doubt that the patient had a pre-existing infection because the scintigraphy scan did not reveal an abscess prior to the injection. Because the patient self-catheterized several times daily, we suspect that the urinary tract provided the bacterial source. For more than 50 years, it has been recognized that genitourinary tract infections, especially after instrumentation of the tract, can metastasize to the spine [8–13]. The pelvic venous plexus has been postulated as a potential route of spread [14–16]. Our patient self-

catheterized several times daily, which could result in transient bacteremia. It is also unclear why the abscess developed at the L2/3 level as opposed to the level actually injected. Speculatively, because the injection was periarticular, corticosteroid was able to track up to the L2/3 level and formed a nidus of infection. Rich arterial anastomoses exist between vertebral levels and are a potential conduit for spread [10,17].

Hematogenously derived pyogenic facet joint infections, though very rare, have been better described in the literature. Muffoletto et al. reported six cases that occurred in one institution over a 14-year period and provided an analysis of the other 27 reported cases existing in the literature [18]. Five of the patients in their series and 42% of the reported cases in the literature have had a recent extraspinal source of infection prior to development of the septic facet joint. Plain radiographs failed to demonstrate erosive arthritis. Technetium-99 bone scintigraphies demonstrated an inflammatory process in 20/20 cases, Gallium-67 scintigraphies were positive in 7/8 cases, and MRI scans demonstrated infection in 23/25 cases [18]. ESR and C-reactive proteins (CRP) were elevated in all cases [18]. In our patient the ESR was found to be prolonged early in her course but unfortunately did not prompt an infectious workup. Epidural spread complicated 25% of the cases. *Staphylococcus aureus* was the most common infectious agent. Unlike iatrogenic septic facet arthritis, which mostly required surgical intervention, hematogenous pyogenic facet joint infections responded well to percutaneous drainage (85% success) or intravenous antibiotics alone (71% success) without surgical intervention in the majority of cases [18].

In conclusion, this case describes a rare but devastating complication of facet injections. As extraspinal sources of infection are common in spontaneous cases of septic facet arthropathy, we recommend screening for such infections by a thorough history and physical exam and appropriate diagnostic studies and treating such infections prior to embarking on injection therapy. The diagnosis of septic facet arthritis following facet injections is often delayed. This time delay could be related to the paucity of neurological symptoms and systemic signs of infection during the post-procedure course. The index of suspicion should remain paramount in the differential diagnosis of recalcitrant or worsening back pain following an injection, even in the absence of neurologic changes or constitutional symptoms. Appropriate

workup should consider measurement of serologic nonspecific markers of inflammation such as ESR or CRP. If such markers are elevated or if clinical suspicion is high, then imaging studies such as an MRI scan in conjunction with a scintigraphic scan should potentially be obtained. Earlier diagnosis and therapeutic intervention may result in better outcomes from this complication.

References

- 1 Carrino JA, Morrison WB, Parker L, et al. Spinal injection procedures: Volume, provider distribution, and reimbursement in the US medicare population from 1993 to 1999. *Radiology* 2002;225(3):723-9.
- 2 Kornick C, Kramarich SS, Lamer TJ, Todd Sitzman B. Complications of lumbar facet radiofrequency denervation. *Spine* 2004;29(12):1352-4.
- 3 Horlocker TT, McGreger DG, Matsushige DK, Schroeder DR, Besse JA. A retrospective review of 4,767 consecutive spinal anesthetics: Central nervous system complications. *Perioperative Outcomes Group. Anesth Analg* 1997;84(3):578-84.
- 4 Cook NJ, Hanrahan P, Song S. Paraspinal abscess following facet joint injection. *Clin Rheumatol* 1999;18(1):52-3.
- 5 Alcock E, Regaard A, Browne J. Facet joint injection: A rare form cause of epidural abscess formation. *Pain* 2003;103(1-2):209-10.
- 6 Orpen NM, Birch NC. Delayed presentation of septic arthritis of a lumbar facet joint after diagnostic facet joint injection. *J Spinal Disord Tech* 2003;16(3):285-7.
- 7 Magee M, Kannagara S, Dennien B, et al. Paraspinal abscess complicating facet joint injection. *Clin Nucl Med* 2000;25(1):71-3.
- 8 Siroky MB, Moylan R, Austen G Jr, Olsson CA. Metastatic infection secondary to genitourinary tract sepsis. *Am J Med* 1976;61(3):351-60.
- 9 Friedman JA, Maher CO, Quast LM, McClelland RL, Ebersold MJ. Spontaneous disc space infections in adults. *Surg Neurol* 2002;57(2):81-6.
- 10 Wiley AM, Trueta J. The vascular anatomy of the spine and its relationship to pyogenic vertebral osteomyelitis. *J Bone Joint Surg* 1959;41B(4):796-809.
- 11 Griffiths HED, Jones DM. Pyogenic infection of the spine. A review of twenty-eight cases. *J Bone Joint Surg* 1971;53B:383-91.
- 12 Digby JM, Kersley JB. Pyogenic non-tuberculous spinal infection. An analysis of thirty cases. *J Bone Joint Surg* 1979;61B:47-55.
- 13 Henriques CQ. Osteomyelitis as a complication in urology. *Br J Surg* 1958;46:19-28.
- 14 Demondion X, Delfaut EM, Drizenko A, et al. Radio-anatomic demonstration of the vertebral lumbar venous plexuses: An MRI experimental study. *Surg Radiol Anat* 2000;22(3-4):151-6.

- 15 Batson O. Function of vertebral veins and their role in spread of metastases. *Ann Surg* 1940;112:138–149.
- 16 Batson O. Vertebral vein system as mechanism for spread of metastases. *AJR Am J Roentgenol* 1942; 48:715–8.
- 17 Caglar S, Dolgun H, Ugur HC, et al. Extraforaminal lumbar arterial anatomy. *Surg Neurol* 2004; 61(1):29–33; discussion 33.
- 18 Muffoletto AJ, Ketonen LM, Mader JT, Crow WN, Hadjipavlou AG. Hematogenous pyogenic facet joint infection. *Spine* 2001;26(14):1570–6.