Spondylodiscitis: An Important Differential Diagnosis of Axial Back Pain for the Pain Interventionalist

Ramsey Rayes, MD; Anthony Nazaryan, DO; Rachel Sunico, MD
Department of Physical Medicine & Rehabilitation
University of California, Irvine



INTRODUCTION

- Axial back pain is a commonly encountered complaint for the pain interventionalist who must identify and treat the primary source.
- An estimated 619 million people worldwide experienced low back in in 2020, with prevalence expected to increase to 843 million by 2050.[1]
- Prevalence of low back pain increases with age and peak rate is at 85 years old.[1]
- Spondylodiscitis is infection of the vertebrae and intervertebral discs which may have catastrophic consequences if not treated appropriately including paralysis and death.
- Spondylodiscitis accounts for less than one percent of lower back pain complaints and often has insidious onset which may result in delayed diagnosis and complications.[2]
- Risk factors for developing spondylodiscitis include advanced age, diabetes, immunosuppression, IV drug use, indwelling catheters/central lines, recent bacteremia or spinal instrumentation, and hemodialysis.[3]
- We present a rare case of lumbosacral spondylodiscitis from hematogenous seeding from presumed gastrointestinal source, highlighting the importance of considering this diagnosis on the differential of nonspecific back pain.

MATERIALS AND METHODS

- Written informed patient consent was provided prior to writing of the case report.
- Per the Institutional Review Board (IRB) of University of California, Irvine, case reports typically involve retrospective medical record reviews of three or less patients and are not considered human subjects research and do not require IRB approval.

CASE PRESENTATION

An 80-year-old male being treated with home IV antibiotics for questionable prosthetic mitral and aortic valve endocarditis presented with low back pain and lower extremity weakness. MRI of the lumbar spine revealed spondylodiscitis of L5-S1 with paraspinal and epidural phlegmon. Although the patient remained afebrile without leukocytosis, there was persistent elevation of inflammatory markers including ESR/CRP. Repeat MRI of the lumbar spine was performed given significantly worsening pain and weakness which demonstrated progression of the L5-S1 process despite appropriate coverage for lactobacillus paracasei isolated on initial blood cultures (Fig 1).

Notably, transesophageal echocardiogram did not reveal valvular growth and the patient had no recent dental work. The patient did have transient gastrointestinal bleeding as a potential etiology for bacterial translocation, however colonoscopy and esophagogastroduodenoscopy were unremarkable except for a small polyp found on colonoscopy. Image-guided biopsies of the spine did not have microbial growth, prompting polymerase chain reaction sequencing of the sample which also did not isolate a pathogen. The patient's symptoms improved throughout a prolonged admission with broad range antibiotics and he was subsequently discharged home in stable condition. At the patient's follow up appointment several weeks thereafter, he reported persistent but improved back pain and was transitioned to chronic suppression antibiotics.

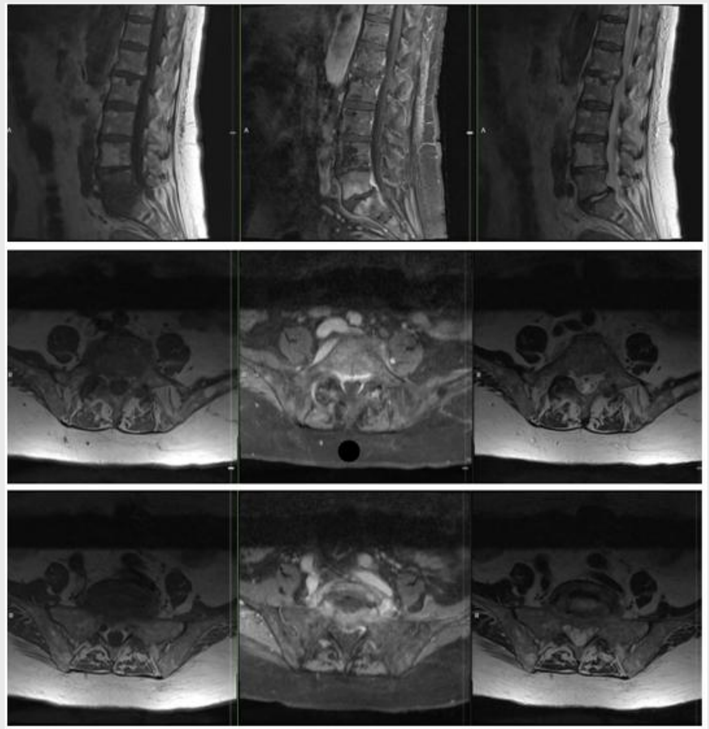


Figure 1. Lumbar spine MRI demonstrating L5–S1 spondylodiscitis with epidural and paraspinal involvement. Each row is displayed as (left) T1-weighted, (middle) T1-weighted post-gadolinium (contrast-enhanced), and (right) T2-weighted sequences.

Top row (sagittal view): Sagittal images through the lumbosacral spine show endplate and disc signal abnormality centered at L5–S1, with T1 hypointensity, T2 hyperintensity, and post-contrast enhancement at the affected level.

Middle row (axial view at the L5 vertebral body): Axial images at the level of the L5 vertebral body demonstrate anterior and posterior paraspinal soft-tissue edema with enhancement, and involvement of the anterior epidural space.

Bottom row (axial view at the L5–S1 intervertebral disc space): Axial images at the L5–S1 disc space confirms disc and adjacent paraspinal involvement, with anterior and posterior paraspinal edema and enhancement extending into the anterior epidural space.

DISCUSSION

- Spondylodiscitis remains an underrecognized cause of nonspecific low back pain, owing to its rarity and often insidious presentation without fever or leukocytosis, as seen in this patient.[4]
- As cultures are negative in approximately 42% of spondylodiscitis cases, contrast-enhanced MRI is the diagnostic gold standard (sensitivity ~92%, specificity ~96%) for early detection of spondylodiscitis.[5,6,7]
- Lumbar spine involvement is the most prevalent location for spondylodiscitis accounting for approximately 60% of cases, followed by thoracic spine at approximately 30% of cases.[4]
- Hematogenous spread is the primary pathway leading to spondylodiscitis and this diagnosis should be more strongly considered in setting of bacteremia. Further, gastrointestinal infections and bleeding are a potential source of hematogenous seeding of bacteria. Other methods of spondylodiscitis include direct external inoculation and spread from contiguous tissues.[4]
- Pain can serve as a significant indicator of clinical response but also as a source of long-term residual disability.[5,6]
- Chronic symptoms after appropriate treatment for spondylodiscitis may support the hypothesis that persistent low-grade infection contributes to back pain.[8]
- Most cases of spondylodiscitis can be managed conservatively. Indications for surgery include failure of conservative management, mechanical instability, and compression of neurological structures.
- Limitations of this case report include the single-patient design, which restricts generalizability, and the relatively short 3-month follow-up.

CONCLUSIONS

Spondylodiscitis remains a rare but underrecognized etiology of nonspecific back pain given its potential for insidious onset and potentially absent fevers or leukocytosis. Physicians who regularly treat nonspecific back pain should keep this differential diagnosis in mind given the potential significant morbidity and mortality of this condition if left untreated.

REFERENCES

1. GBD 2021 Low Back Pain Collaborators. Global, regional, and national burden of low back pain, 1990-2020, its attributable risk factors, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021. Lancet Rheumatol. 2023 Jun;5(6):e316–29. doi:10.1016/S2665-9913(23)00098-X PubMed PMID: 37273833; PubMed Central PMCID: PMC10234592.
2. Cashin AG, Chou R, Weimer MB, McAuley JH. Low Back Pain: A Review. JAMA. 2026 Jul 14;336(2):144–58. doi:10.1001/jama.2026.9631 PubMed PMID: 42295944.
3. Berbari EF, Kanj SS, Kowalski TJ, Darouiche RO, Widmer AF, Schmitt SK, et al. 2015 Infectious Diseases Society of America (IDSA) Clinical Practice Guidelines for the Diagnosis and Treatment of Native Vertebral Osteomyelitis in Adultsa. Clinical Infectious Diseases. 2015 Sep 15;61(6):e26–46. doi:10.1093/cid/civ482
4. Zou X, Li X, He K, Song Q, Yin R. Current knowledge of vertebral osteomyelitis: a review. Eur J Clin Microbiol Infect Dis Off Publ Eur Soc Clin Microbiol. 2025 Feb;44(2):213–31. doi:10.1007/s10096-024-04983-9 PubMed PMID: 39589654.
5. Muthu S, Viswanathan VK, Theiss S, Rajaram Manoharan SR, Kolarpatti Ponnusamy DV, Rajappan Chandra SK, et al. The enigma of culture-negative spondylodiscitis: comparable outcomes despite diagnostic uncertainty – a systematic review and meta-analysis. Eur Spine J. 2026 Jun 9. doi:10.1007/s00586-026-10091-3
6. Yu D, Kim SW, Jeon I. Antimicrobial therapy and assessing therapeutic response in culture-negative pyogenic vertebral osteomyelitis: a retrospective comparative study with culture-positive pyogenic vertebral osteomyelitis. BMC Infect Dis. 2020 Dec 9;20:939. doi:10.1186/s12879-020-05669-1 PubMed PMID: 33297994; PubMed Central PMCID: PMC7726898.
7. Conti J, Geremia N, Di Bella S, Zadra F, Zerbato V, Babich S, et al. Infectious spondylodiscitis: Epidemiology, diagnosis, microbiological findings, clinical features and outcomes in a 14-year retrospective study. Eur J Clin Microbiol Infect Dis Off Publ Eur Soc Clin Microbiol. 2025 Dec;44(12):3067–78. doi:10.1007/s10096-025-05292-5 PubMed PMID: 41023355; PubMed Central PMCID: PMC12753542.
8. Urquhart DM, Zheng Y, Cheng AC, Rosenfeld JV, Chan P, Liew S, et al. Could low grade bacterial infection contribute to low back pain? A systematic review. BMC Med. 2015 Jan 22;13:13. doi:10.1186/s12916-015-0267-x PubMed PMID: 25609421; PubMed Central PMCID: PMC4320560.