

Clay-Shoveler’s Fracture Presenting as Chronic Scapular Pain in an Adolescent Athlete: A Case Report

Raj I. Patel, M.D., Tetyana Marshall, M.D., Lee Tian, M.D., Bhuvaneswari Sandeep Ram, M.D.
Department of Anesthesiology and Critical Care, University of Chicago, Chicago, Illinois

INTRODUCTION

- Clay-shoveler’s fracture is an avulsion of a lower cervical or upper thoracic spinous process. It is caused by forceful muscle contractions of the trapezius and rhomboid muscles.
- The name originated in the 1930s from Australian clay shovelers who were prone to this injury; today, however, it is most recognized in athletes.
- This diagnosis is rare, especially in adolescents.
- Presents as chronic neck or upper back pain without a clear traumatic event.

METHODS

- According to the University of Chicago IRB policy, the publication of a single de-identified medically challenging case is not considered human subjects research and is exempt from IRB review.
- We retrospectively reviewed the patient’s medical records and removed all patient identifiers.
- Patient and guardian’s informed consent was obtained for submission of a case report.
- All interventions aligned with the standard of care.
- No off-label drug use or investigational treatments were involved.

CASE DESCRIPTION

- A 13-year-old female competitive softball player and swimmer presented with three weeks of progressive upper thoracic and right scapular pain. Denied acute injury.
- She described a 6/10 burning and stinging sensation in the upper back that interfered with sleep and school. Pain was worse with activity and mildly improved with rest and ice.
- Initial management with naproxen, baclofen, and physical therapy provided minimal relief.
- A thoracic MRI was obtained, which was unremarkable. Conservative treatment with NSAIDs, steroids, and topical creams was recommended.
- Six months later, the patient’s pain persisted. She was evaluated by orthopedics and neurosurgery. Spine radiographs and a shoulder MRI were obtained, which only demonstrated mild labral degeneration without tears.
- Given the unclear etiology of her pain, the initial MRI was re-evaluated with orthopedics and radiology. Upon review, they noted edema at the C7–T1 spinous processes consistent with a Clay-shoveler’s fracture.
- The patient was then referred to the pain clinic, where she was treated with a course of muscle relaxants and a fluoroscopy-guided injection of 0.25% bupivacaine with 20 mg triamcinolone directly at the C7-T1 spinous process fracture site. The injection resulted in near-complete pain relief (pre-procedure pain score 8/10 to post-procedure pain score 2/10) and improved shoulder function.

DISCUSSION

- Clay-shoveler’s fracture in adolescent athletes that was initially overlooked due to normal radiographic findings. This diagnosis is particularly challenging in adolescents as the ossification center of the spinous processes are not fully developed, making it harder to identify on imaging.
- The clear bony avulsion at the spinous process generally consistent with a Clay-shoveler’s fracture may be invisible on standard radiographs and MRI is warranted. In our patient, it was the edema noted on re-evaluation of the thoracic MRI that led to the conclusion a fracture may be suspected.
- Clay-shoveler’s fractures are stable injuries that typically heal with conservative management including rest, immobilization, analgesics
- If pain persists, corticosteroid and anesthetic injection may help avoid surgery.
- Early recognition is key to effective treatment and a safe return to athletic activities

REFERENCES

- 1) Posthuma de Boer, J., van Wulfften Palthe, A. F. Y., Stadhouder, A., & Bloemers, F. W. (2016). The Clay Shoveler’s Fracture: A Case Report and Review of the Literature. The Journal of Emergency Medicine, 51(3), 292–297. <https://doi.org/10.1016/j.jemermed.2016.03.020>
- 2) Bello, J. S. R., Varón, D. F. C., Saavedra, J. L. R., Lugo, C. M. R., Mendez, J. N. P., & Salazar, L. R. M. (2024). The clay-shoveler’s fracture, a rare occupational injury in the modern era: a case report. Egyptian Journal of Neurosurgery, 39(1), Article 23. <https://doi.org/10.1186/s41984-024-00291-8>
- 3) Yamaguchi, K. T., Myung, K. S., Alonso, M. A., & Skaggs, D. L. (2012). Clay-Shoveler’s Fracture Equivalent in Children. Spine (Philadelphia, Pa. 1976), 37(26), E1672–E1675. <https://doi.org/10.1097/BRS.0b013e318273e191>
- 4) Toman, E., Beaven, A., Harland, S., & Porter, K. (2016). Clay-shoveler’s fracture: A snapshot. Trauma (London, England), 18(3), 186–189. <https://doi.org/10.1177/1460408616640998>
- 5) Hasley I. B., Gruner M. P., Soma D. B., Sellon J. L. (2021). Persistent Pain after Clay Shoveler’s Fracture Delayed Union: The Role for Ultrasound-Guided Corticosteroid Injection. Int J Sports Exerc Med 7(2). doi.org/10.23937/2469-5718/1510189

*Figure 1: MRI Thoracic Spine
Wo with a sagittal view (left)
and an axial view (right) both
demonstrating an area of
edema around the C7-T1
spinous process.*

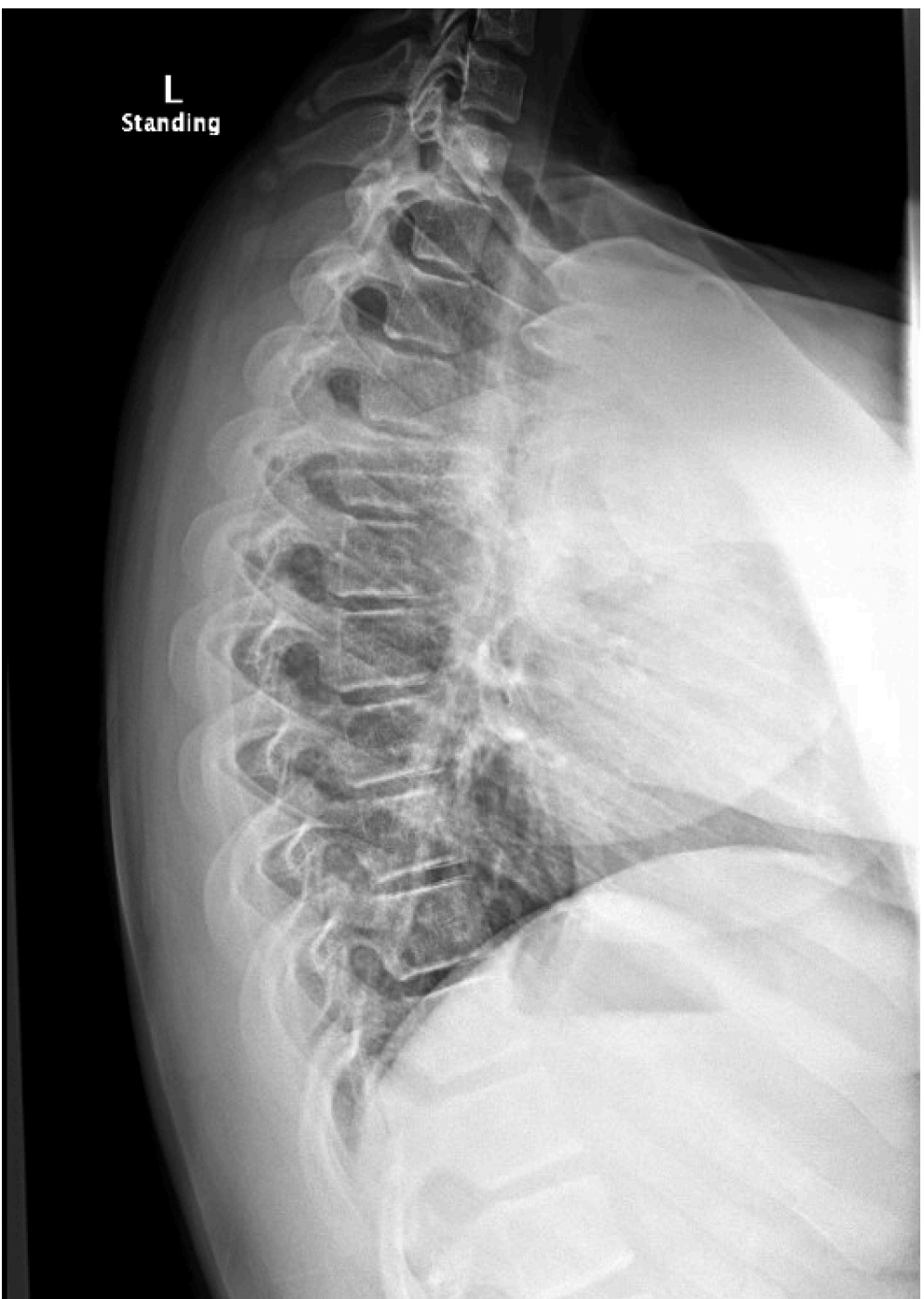
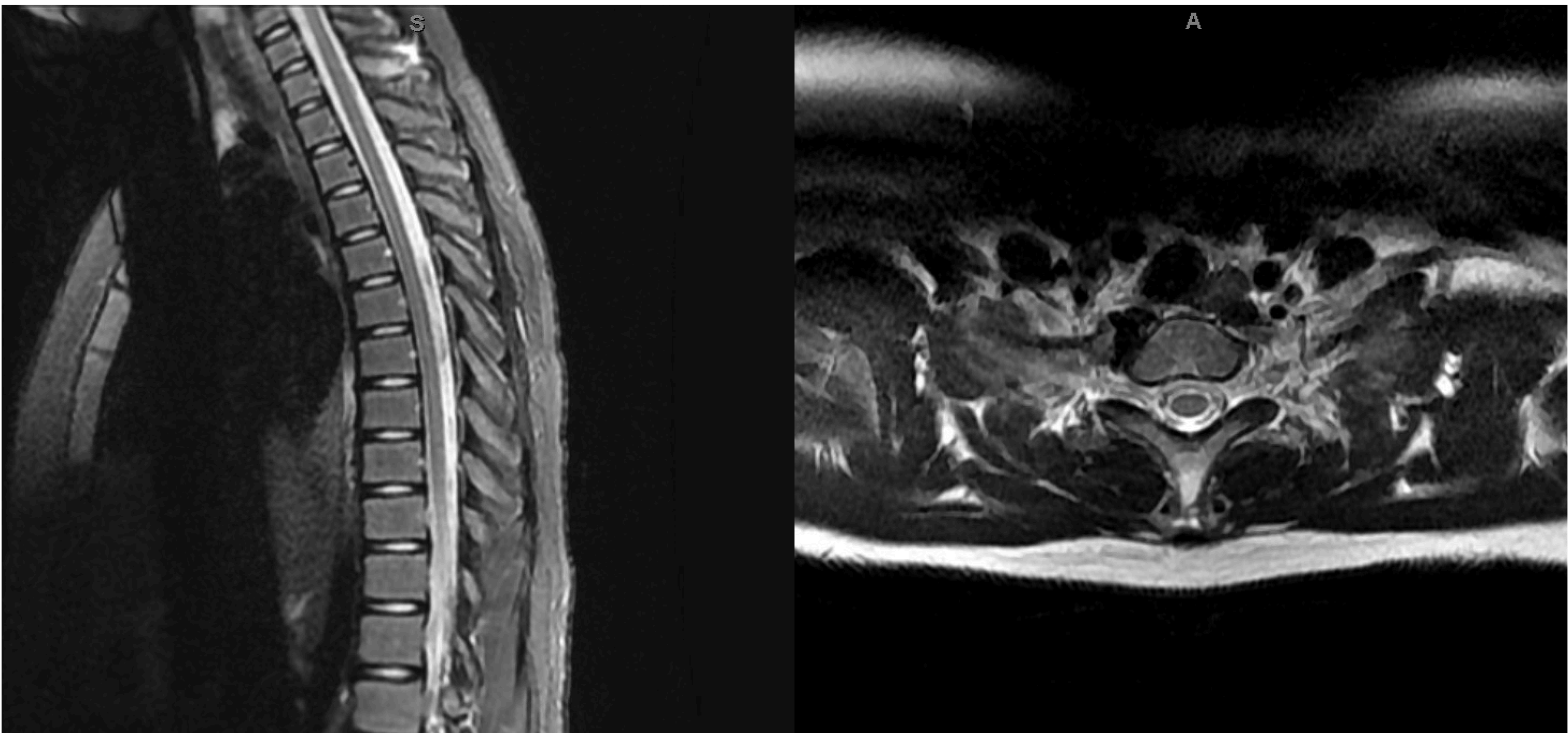


*Figure 2: X-Ray Thoracic
Spine Lateral View
demonstrating avulsion
fractures visible at the C7-
T1*