

Pain due to Rare Infection Following Kyphoplasty

Introduction/Background

Vertebroplasty and kyphoplasty are percutaneous procedures commonly performed to treat vertebral compression fractures. Vertebroplasty involves injection of bone cement into the damaged vertebral body. Kyphoplasty involves inflation of a balloon into the vertebral body to create a cavity for subsequent bone cement injection.

Both procedures are minimally invasive and thus considered generally safe with low complication rates. Major adverse events include extravasation of bone cement and development of repeat or adjacent fractures. Infection following vertebroplasty or kyphoplasty is overall rare, with one case series describing 6 incidences in a patient population of 1,307 (0.46%) over 25 years.

Case

A 26-year-old male with a history of traumatic T5 spinous process fracture and T6 compression fracture status post SpineJack kyphoplasty presents to an outpatient pain clinic with persistent pain. The pain from the fractures initially resolved following kyphoplasty but then slowly returned and progressively worsened. He describes the pain as follows –

- Sharp, stabbing left-sided and mid-thoracic back pain.
- Exacerbated by prolonged upright positioning, walking, activity, deep inspiration.
- Improved with rest and forward flexion of the back.
- Physical exam revealed a symmetric back with no obvious deformities, nontender to palpation, and overall limited range of motion.

The patient trialed hydrocodone-acetaminophen, cyclobenzaprine, gabapentin, naproxen, and meloxicam with minimal relief. He also underwent bilateral thoracic facet joint injections (T5-6, T6-7) twice with no improvement. Physical therapy, massage therapy, and acupuncture were also tried with little benefit.

Of note, the patient went to the ED once due to pain. Workup with labs showed slightly elevated WBC count and liver enzymes. CT imaging demonstrated bone cement migration to the azygos vein (figure 1), though this finding was unlikely to explain his pain. Repeat labs after that visit showed normal WBC count and liver enzymes values that trended down back to the normal.

Due to persistent pain, the patient elected to undergo thoracic vertebrectomy with T5-7 fusion after consulting with a spine surgeon. Intra-operative biopsies of the spine revealed infection with *Cutibacterium* (formerly *Propionibacterium*) *acnes*. Patient was subsequently treated with antibiotics. He received cefazolin for perioperative prophylaxis followed by vancomycin for 2 weeks post-op and cephalexin taper for 2 months.

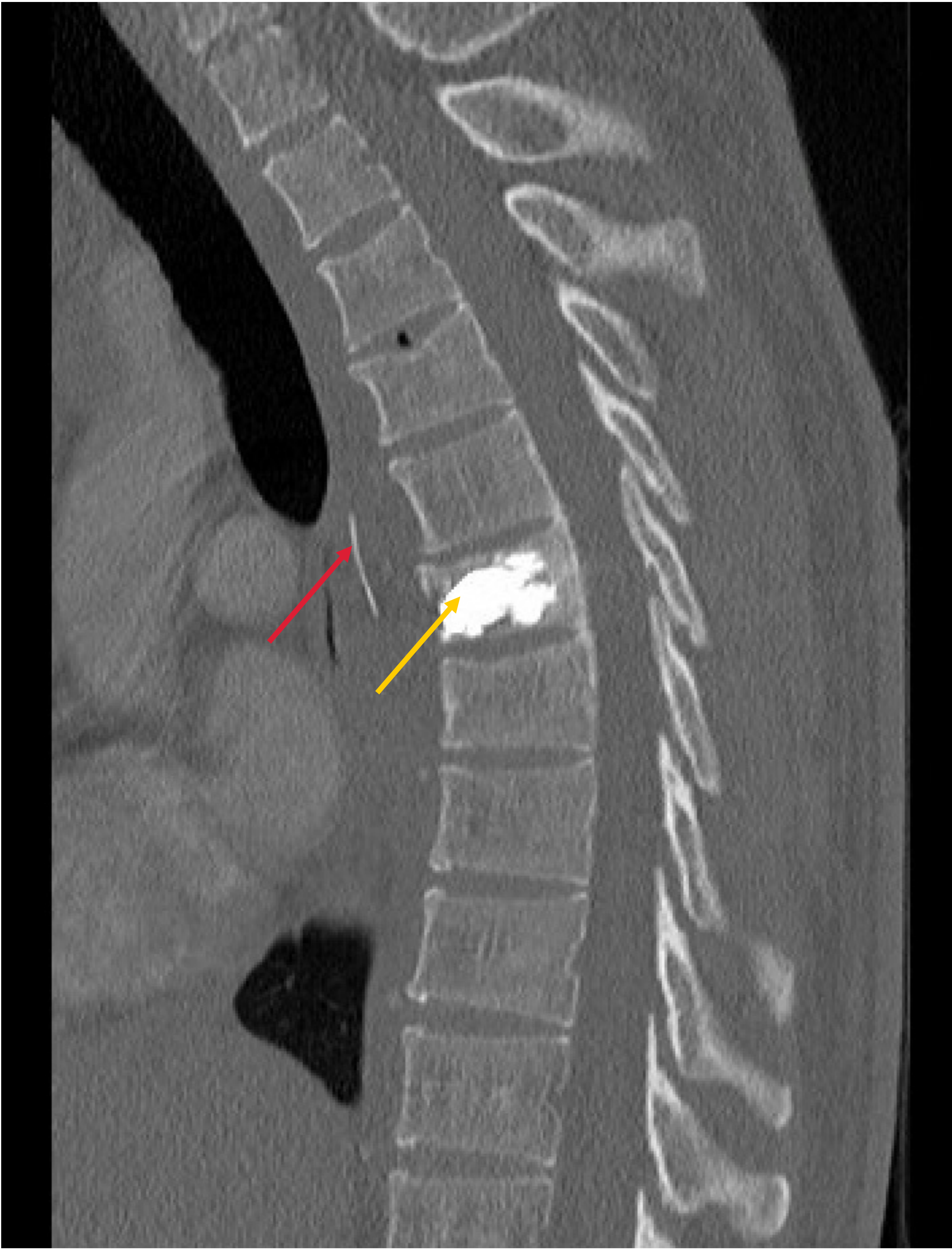


Figure 1. Evidence of prior SpineJack kyphoplasty (yellow arrow) with extravasation of bone cement (red arrow) seen on CT SPECT imaging.

Discussion

- Infection may present as nonspecific back pain.
 - May not present with any overt signs of infection (erythema, purulence, fluctuance, overlying skin changes, fever, constitutional symptoms).
 - Differential diagnosis in this case also included refracture or adjacent fractures as well as usual sources of pain (mechanical versus neuropathic).
- Thorough history taking and physical exam is important in determining the possible etiology of pain.
 - “Red flags” that can point to alternative etiology include preceding trauma, comorbidities (arthritis, neurodevelopmental disorders, autoimmune conditions), constitutional symptoms, and neurologic findings.
- Although imaging may be useful for diagnosis, it can be normal or nonspecific, such that making a clear diagnosis is difficult.
- Antibiotics and implant removal or replacement is the mainstay of treatment for infection.
 - There is growing evidence that utilizing a longer duration of antibiotics is more efficacious.
- Prophylaxis includes the use of targeted antibiotics, longer duration of antibiotics, antibacterial-coated implants, and evidence-based sterile techniques to decrease contamination.

Conclusion

Infection following vertebroplasty and kyphoplasty is rare, with most literature reporting incidence rates <1%. In patients who present with intractable pain following vertebroplasty or kyphoplasty, infection should be considered on the differential and ruled out. An infection can be difficult to identify as it may not present with any obvious symptoms and may not be clearly demonstrated on imaging. It is imperative to take a detailed history and perform a comprehensive physical exam to clarify possible etiology and determine the next best steps.

References

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