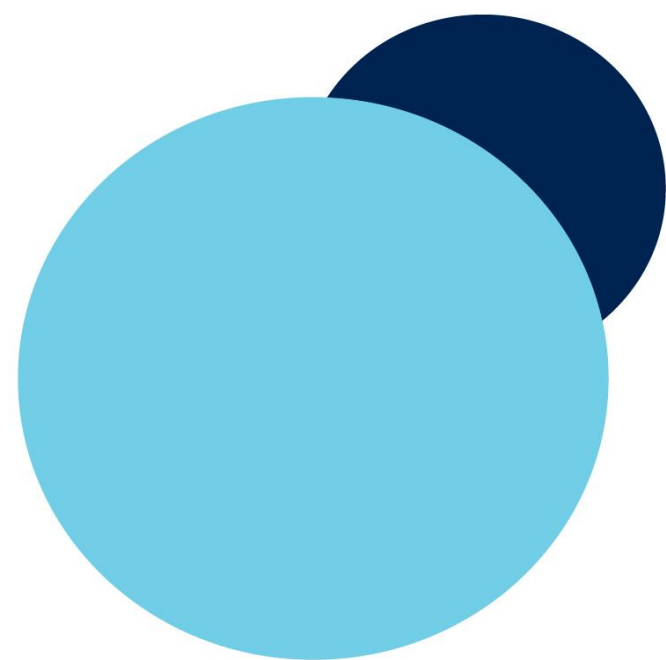


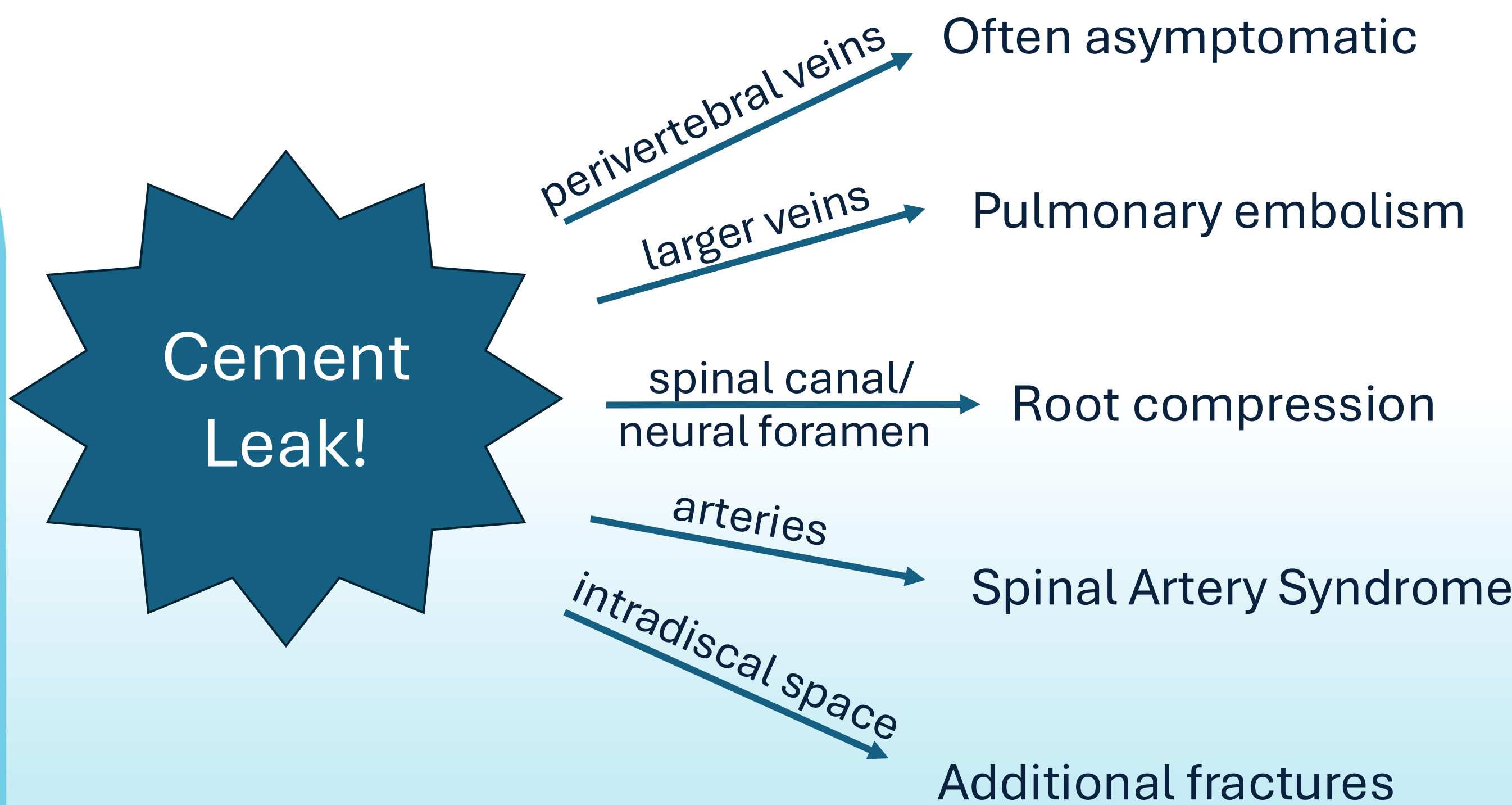
Kyphoplasty Conundrum: Cement Extravasation after Attempted Compression Fracture Repair

Aleksandar Wood DO, Delia Shaher MA MS-IV, Ramsis Ghaly MD
Anesthesiology, Cook County Health, Chicago, IL, USA



Background

Cement extravasation is a known complication of percutaneous vertebral augmentation. While kyphoplasty is considered superior to vertebroplasty in minimizing leakage risk, the incidence remains as high as 47%^{1,5}. Most leaks occur into perivertebral veins and are asymptomatic. However, cement may migrate into the spinal canal, neural foramina, or vasculature, potentially causing neurological deficits or even cardiovascular compromise^{3,4}. These grave outcomes underscore the importance of careful technique and patient selection.



Case Report

- 73F with L₃₋₄ foraminal stenosis, L₄₋₅ spondylolisthesis, osteoporosis, and multiple lumbar compression fractures
- Recent L₄ compression fracture s/p LESI and kyphoplasty
- Initial pain resolved, replaced by new severe pain in left anteromedial thigh after kyphoplasty
- CT & MRI confirmed cement extravasation into left L₃₋₄ neural foramen
- Performed left L₃₋₄ TFESI
- Patient returned to work with partial relief 1 month later



Lumbar CT taken after kyphoplasty demonstrating left-sided cement extravasation

Discussion

Patient selection is a critical step prior to balloon kyphoplasty. While foraminal stenosis adjacent to the target vertebra is not necessarily a contraindication, this case exemplifies how a common complication such as cement leakage can have detrimental effects when there are anatomic abnormalities in the near vicinity. Various strategies to minimize extravasation can be employed, including slow, low-volume, and low-pressure injection, using higher viscosity cement, and employing the "eggshell" technique². Once extravasation is suspected, injection should be stopped immediately and confirmed with diagnostic imaging. Neurosurgical consultation is also warranted to assess candidacy for surgical intervention. Our management provides rationale for the use of transforaminal steroid injection to control symptoms after such an extravasation occurs.

References

1. Cloft, H J, and M E Jensen. "Kyphoplasty: An Assessment of a New Technology." *AJNR. American Journal of Neuroradiology*, U.S. National Library of Medicine, Feb. 2007.
2. Lo, Haoju. "The experience of eggshell technique during kyphoplasty to prevent cement leakage in treatment of osteoporotic vertebral fracture." *Global Spine Journal*, vol. 6, no. 1_suppl, Apr. 2016, <https://doi.org/10.1055/s-0036-1582653>.
3. Rose, L. D., et al. "Clinical significance of cement leakage in Kyphoplasty and Vertebroplasty: A systematic review." *European Spine Journal*, vol. 33, no. 4, 24 Nov. 2023, pp. 1484–1489.
4. Semaan, Hassan, et al. "Clinical outcome and subsequent sequelae of cement extravasation after percutaneous kyphoplasty and Vertebroplasty: A comparative review." *Acta Radiologica*, vol. 59, no. 7, 27 Sept. 2017, pp. 861–868.
5. Sheen, Soun, et al. "Retrospective analysis of cement extravasation rates in vertebroplasty, kyphoplasty, and Bone Tumor Radiofrequency ablation." *Journal of Clinical Medicine*, vol. 14, no. 9, 23 Apr. 2025, p. 2908.