

Safety and Efficacy of Bony Tumor Radiofrequency Ablation

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BACKGROUND

- Bony tumor radiofrequency ablation (RFA) is a minimally invasive surgical procedure that is utilized to decrease tumor burden and can be used in conjunction with vertebral augmentation (1)
- RFA can help reduce dependence on pain medication by disrupting the nerve fibers relaying the pain signals from the site of pain to the brain by creating an area of heat to deaden the sensory nerve associated with the pain (2)
- RFA can be used to treat the underlying tumor of pathological fractures but has contraindications on when to be utilized such as spinal instability (3)

MATERIALS & METHODS

- A retrospective study was done to look for RFA safety and efficacy
- Treatment efficacy and safety were determined based on pain score reduction, and incidence of adjacent level compression fractures
- Inclusion criteria: Age of at least 18 years or older, patients who underwent vertebral augmentation and RFA between January 2016 and May 2024, and complete clinical/radiological data
- Exclusion criteria: Patients with incomplete clinical/radiological data and those who received fusion procedures at the same time

RESULTS

Cement Extravasation	
Total (N)	379
Cement Leak (N, %)	227 (59.9%)
Location of cement leak	
Disc	109 (48.0%)
Paravertebral/vascular	73 (32.3%)
Posterior	23 (10.1%)
Multidirectional	22 (9.7%)
Adjacent Fractures	
Total (N)	372 (7 unknowns excluded)
Adjacent Fracture (N, %)	38 (10.2%)
Average follow-up time	240 days
Average time to fracture	99 days
Pain Score	
Percentage reduction	Insignificant, 0.16 reduction in NRS pain scale

Table 1: Collected data indicating risks of cement extravasation, adjacent fractures, and pain score up to 1 year post operatively

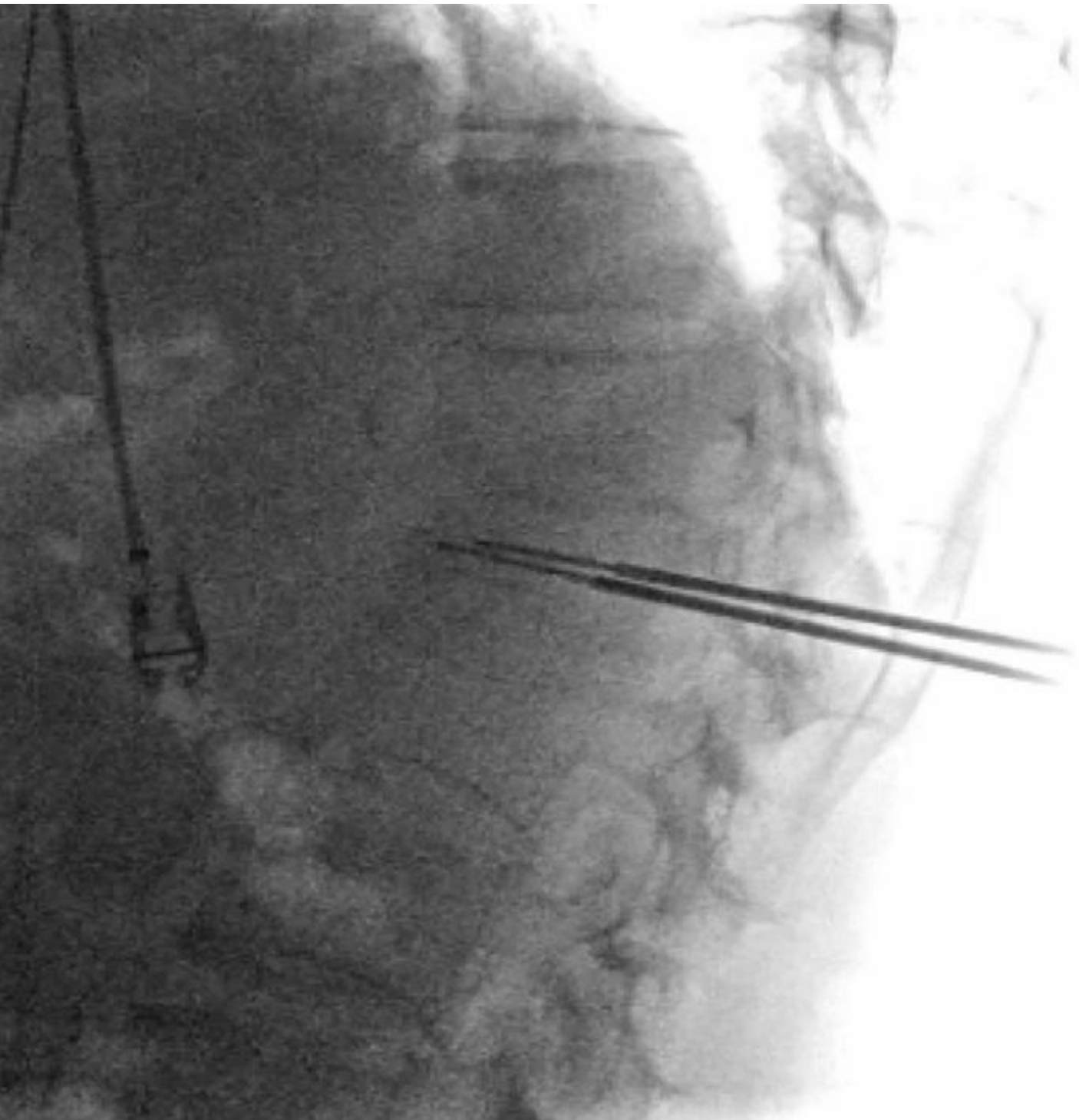


Image 1: Fluoroscopy guided RFA of L1 vertebral body prior to vertebral augmentation

DISCUSSION

- Historically the data for cement extravasation is between 11 and 73%, and we thought that the advancements in imaging techniques would mitigate this risk, but we can see it did not (4)
- The mechanism of action of RFA affects the surrounding tissue and can lead to potential adjacent vertebral deformity, collapse, or fracture
- Studies show that the rate of fracture following augmentation is between 10%–40% (5), our preliminary data shows that risk of fracture being at the low end of that range at 10.2% occurring at a mean of 99 days postoperatively with average follow-up time being 240 days
- Interestingly enough, we did notice that with a one unit increase in age, chances of developing cement extravasation decreased by about 1.9%

CONCLUSION

- Treatment utilizing RFA with augmentation has found to have rates of cement extravasation and adjacent fractures in a similar range to that of augmentation without RFA
- Bone tumor RFA can be safely performed in conjunction with vertebral augmentation for pathologic fractures due to related vertebral body lesions
- A comprehensive patient history should be taken to assess the risk versus benefit for patients who are being considered for ablation
- RFA should be considered for patients who are unable to undergo larger invasive procedures, such as the elderly, as it can lead to similar benefits and a decreased risk of potential complications

FULL POSTER

REFERENCES

