Multilevel Vertebral Hemangiomas and Kyphoplasty Complicating Basivertebral Nerve Ablation Technique

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Key Takeaways

- Highlights **technical considerations** and **imaging strategy** to safely perform **basivertebral nerve ablation (BVNA)** in a patient with **vertebral hemangiomas** and **prior kyphoplasty**.
- **Image-guided navigation** is valuable for overcoming **anatomic challenges** during BVNA.
- Navigation can **expand procedural options** for patients with **chronic vertebrogenic low back pain** and **complex spinal anatomy**.

Introduction

Vertebral hemangiomas are commonly incidental findings and rarely symptomatic; may pose technical challenges when associated with vertebral endplate changes.[1]
Basivertebral nerve ablation (BVNA) has emerged as an effective treatment for chronic vertebrogenic back pain, particularly in patients with **Modic type I and II changes.**[2,3]
Hemangiomatous bone presents unique procedural difficulties for ablation due to:
• Softened tissue composition
• Unpredictable electrical impedance[4,5]
BVNA was performed at L4, 5, and S1.

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Fig. 1: Left: Pre-fracture MRI showing hemangioma at L3 Right: STIR sequence showing L3 endplate compression fracture, Modic type I/2 changes at L4-S1

Fig. 2: Unipedicular L3 kyphoplasty

Fig. 3: L4 (probe in place) L5 with J Stylet for basivertebral nerve ablation. S1 was also ablated.

Case Presentation

Case Summary:
72 yo M with chronic axial low back pain who was found to have multiple lumbar spinal hemangiomas, including a prominent lesion near the L3 superior endplate, and suffered a L3 vertebral compression fracture (Fig 1).

Initial Management:
MRI showed Modic type I changes at L4, L5, and S1 endplates (Fig 1).
Underwent L3 kyphoplasty (Fig 2) with improvement in pain.
Persistent vertebrogenic axial low back pain remained post-procedure.

Intervention:
Patient elected to undergo basivertebral nerve ablation (BVNA) at L4, L5, and S1.

Challenges:
Hemangiomatous bone with low density, preventing stable J-stylet anchoring.
Higher electrical impedance near hemangiomas complicating radiofrequency ablation.

Technique modification:
Ensured accurate needle trajectory and avoidance of hemangiomatous regions (Fig 3) using image-guided navigation.

Outcome:
Successful targeted BVNA avoiding hemangiomas without complications.
~90% sustained reduction in axial back pain and improved physical function.
No adverse effects noted on 6 mo follow-up.