

Precision in Pain Management: Ultrasound-Guided Radiofrequency Ablation for Intercostal Neuralgia

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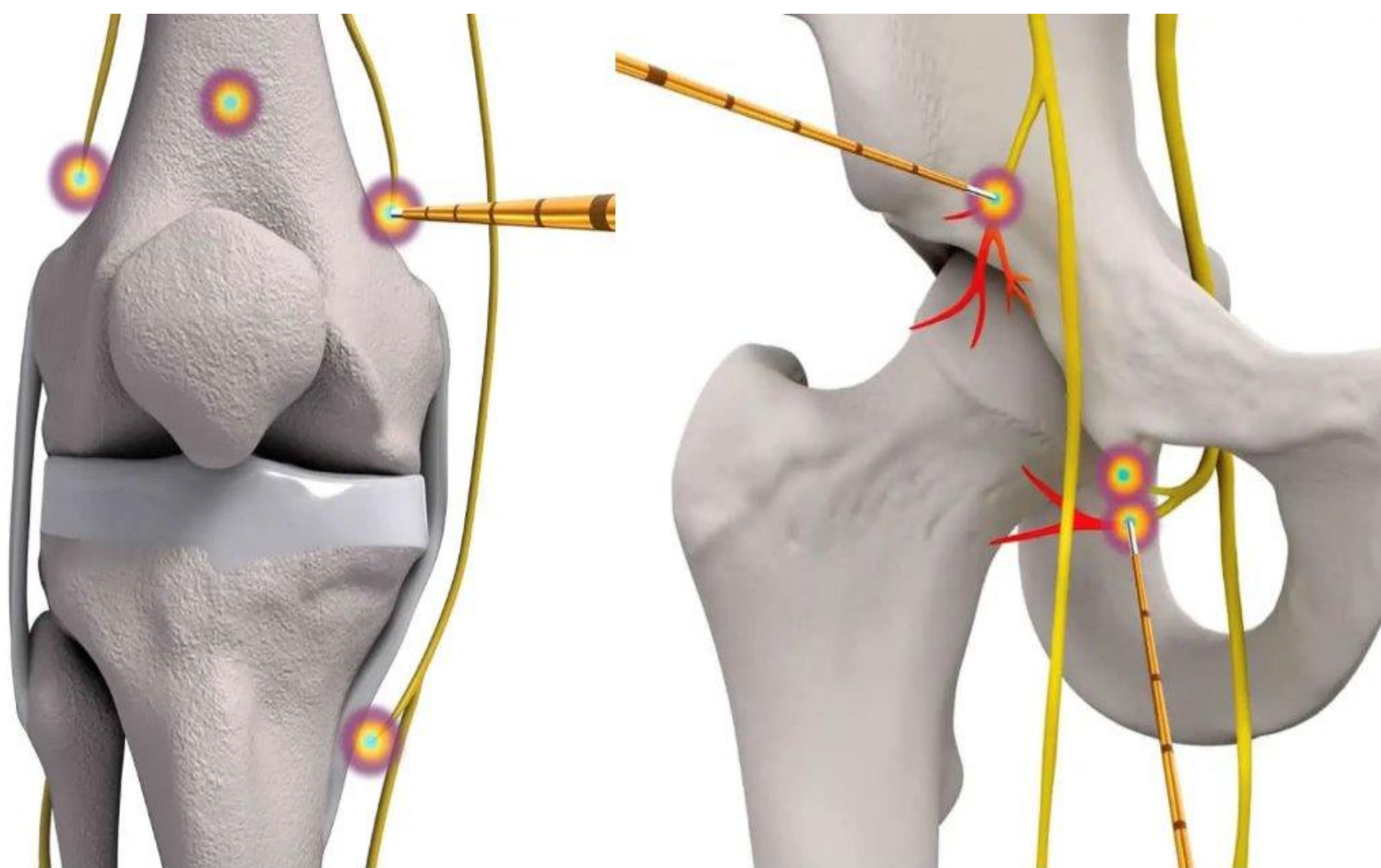
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Background

This case report presents the management of a 76-year-old female with persistent chest wall and back pain following thoracic meningioma resection. Intercostal neuralgia is a disorder characterized by extremely painful, sharp, shooting pain which follows the distribution of the associated intercostal nerve¹. The patient's pain, described as severe and persistent, originated from under the breast, radiated through to the back. The patient experienced inadequate relief from a spinal cord stimulator trial and previous treatments, leading to the decision to pursue an ultrasound (US) guided intercostal nerve radiofrequency ablation (RFA).



Typical RFA sites include genicular nerves, as well as medial branch nerves of the dorsal ramus. RFA can assist precisely targeting tissue through image guidance to endure treatment is focused on the target area.



Procedure Description

During the procedure we visualized the right T5-T6 and T6-T7 regions at the angle of the rib using in plane ultrasound transverse access. After proper positioning of the trochar, as explained in Figure 1, 50 Hz sensory stimulation was performed showing good paresthetic capture of the right T5-T6 and T6-T7 intercostal regions. 2 Hz motor stimulation showed intercostal muscle stimulation. Radiofrequency ablation was performed with average tissue temperature of 80 °C for 120 seconds right T5-T6 and T6-T7.

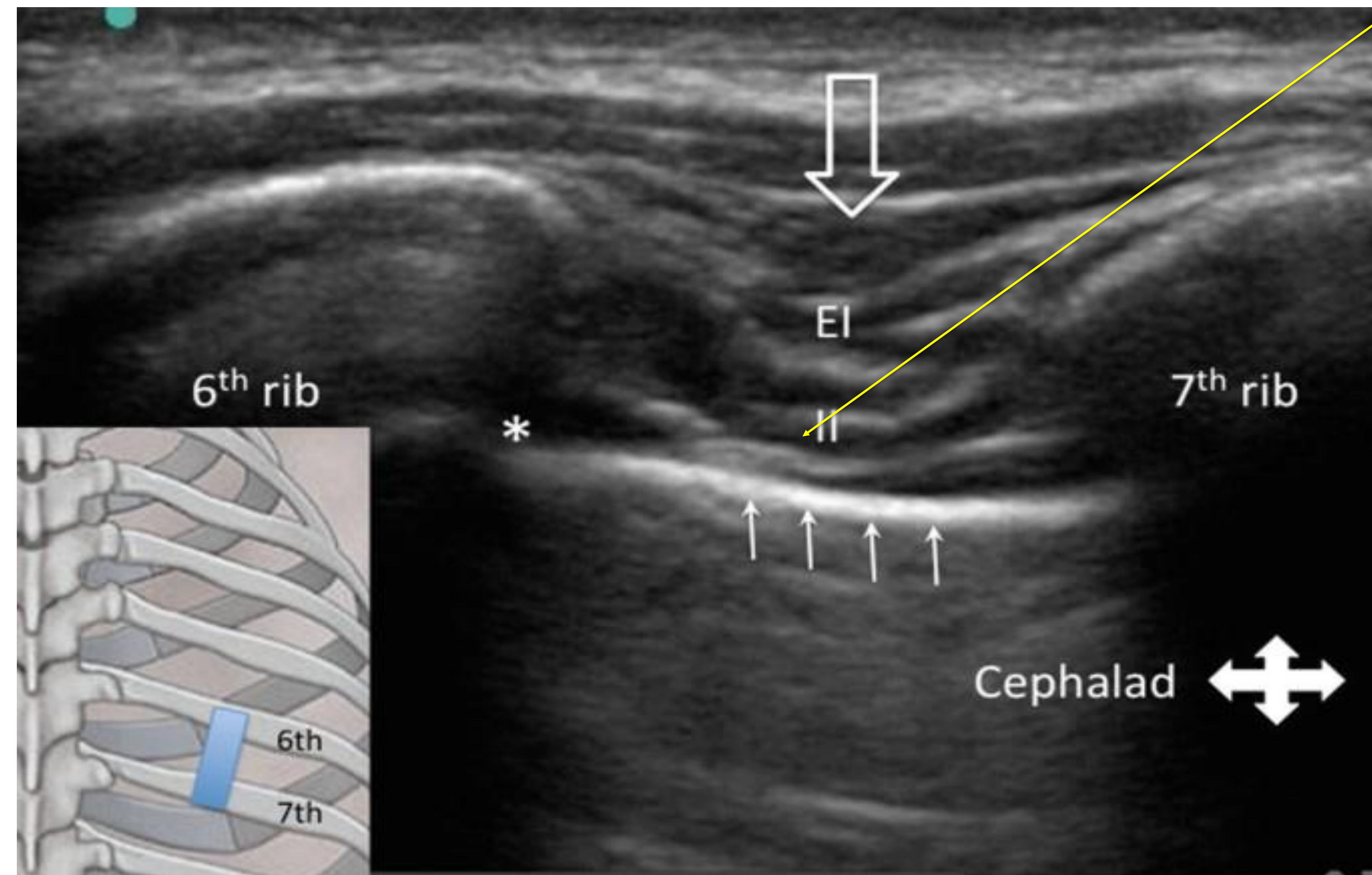


Figure 1. Depicted is an in-plane transverse access, distal to proximal, ultrasound guided intercostal RFA. The RFA needle was advanced down to the intercostal nerve distribution, maintaining posterior positioning to avoid vascular structures. (Modified image via Abd-Elseyed A, Lee S, Jackson M. Radiofrequency ablation for treating resistant intercostal neuralgia. Ochsner J. 2018;18(1):91) *Asterisk: Vascular bundle of 6th intercostal vascular bundle (Vein (most superior) & artery. EI: External Intercostal Muscle II: Internal Intercostal. Upward pointing arrows: Indicating lung pleura, Yellow Arrow: RFA Needle Trajectory*

Discussion

The patient reported that the pain was debilitating, likened to an "elephant sitting on the vertebrae" and "fire" in the breast, significantly impacting her quality of life.

Following the US-guided intercostal nerve RFA, the patient experienced notable changes in her pain profile:

- ❑ Post-meningioma resection neuropathic pain persisted under the breast and side, with improvement in deep back pain.
- ❑ Pain intensity was reduced from a 20 to an 8 on a scale of 1-10 at 2 weeks out, with expected improvement in following weeks as the nerves continue to undergo Wallerian degeneration.
- ❑ Skin sensitivity to touch, described as needle-like sensation, remained present but improved.

Conclusion

This case highlights the complex interplay between structural changes post-surgery and chronic pain management. The unsuccessful spinal cord stimulator trial and ongoing pain led to the consideration of intercostal nerve RFA. The utility of RFA's has proven beneficial at decreasing intercostal neuralgia in the setting of prior trauma or cancer²⁻⁴.

The use of ultrasound guidance in this case was pivotal. It facilitated accurate needle placement and minimized the risks associated with blind or fluoroscopy-guided techniques. Ultrasound provided real-time imaging, allowing for better visualization of the intercostal nerves and surrounding structures, which is particularly important in patients with complex anatomy or previous surgical alterations⁵. This approach improved the safety and efficacy of the procedure and enhanced patient outcomes, showing the utility of ultrasound guidance in interventional pain management.

Referen

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