



Lumbar Radiofrequency Ablation – Myths and Facts: A narrative review of device and procedure-related factors that may impact outcomes.

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BACKGROUND

- Lumbar radiofrequency ablation (LRFA) is the second most frequently performed procedure for the management of facet-mediated chronic lower back pain (CLBP).
- This etiology accounts for 5% to 45% of cases. Despite a 568% increase in use of LRFA over the past two decades, numerous aspects of LRFA remain controversial and commonly debated [1-3].

OBJECTIVE

This review aimed to critically examine the literature on LRFA through a discussion of device and procedure-related factors that may impact treatment outcomes, as well as the myths and facts related to LRFA.

METHODS

- A narrative review of PubMed indexed studies published in English for the past four decades. Original research, clinical trials, systematic reviews, meta-analyses, and case series were included. Studies reporting on the safety profile, procedural and device-related factors that could impact treatment outcomes were included. Letters to the editors, expert opinions, commentaries and case reports were excluded. Full-texts of potentially relevant studies were assessed for inclusion. Discrepancies were resolved by a third reviewer. Data was extracted using a standardized method. The results were synthesized narratively, highlighting areas of consensus and controversy.

RESULTS

- Various procedural and device-related factors significantly influence LRFA lesion size and potentially clinical outcomes. Key factors include **needle orientation and angle (parallel and parasagittal orientation)**, **cannula type**, **diameter (from 22 to 16G)** and **length (from 10 to 15mm)**, **procedural temperature (from 80 to 90°C)**, **duration (from 60 to 90 seconds)**, and **pre-injectate volume (0.5 to 0.7mL)** [4-7]. There is **limited evidence suggesting that the use of steroids before or after LRFA impacts lesion size or patient outcomes** [8-10].
- LRFA has a generally favorable safety profile, with a low risk of unintended injuries, even in patients with **spinal hardware and implantable devices** [11-12]. **Motor testing**, when combined with multiplanar fluoroscopic guidance, can help ensure accurate needle placement [11]. While some degree of **multifidus atrophy is plausible** following LRFA, the evidence remains inconclusive. Similarly, it is uncertain whether LRFA accelerates spinal degeneration [13-16]. Though emerging techniques such as the multifidus-sparing approach and endoscopic rhizotomy show promise, further high-quality studies are necessary to compare their outcomes with traditional LRFA [17-18].

Statement	Classification
LRFA has a positive safety profile	Fact
LRFA has a positive clinical benefit with level I evidence	Fact
Temperature and time affect lesion size	Fact
Needle angles, diameters, and lengths affect lesion size	Fact
Motor testing prior to LRFA is recommended	Fact
Injectate volume affects lesion size	Fact
Steroid use affects lesion size	Not clear
LRFA is not safe with posterior hardware	Myth
LRFA is not safe with implantable electrical devices	Myth
LRFA leads to multifidus atrophy and accelerated spinal degeneration	Not clear
Multifidus sparing technique is superior to traditional LRFA	Not clear
Endoscopic rhizotomy is superior to traditional LRFA	Not clear



CONCLUSION

- The substantial body of evidence supports LRFA as an effective treatment for facet-mediated CLBP, with significant clinical benefits [19]. The safety profile of LRFA is generally favorable but is not without complications [20]. Current evidence on multifidus atrophy post-LRFA remains inconclusive, despite the overtly destructive nature of the procedure [21]. The efficacy and safety of LRFA for CLBP depend significantly on both device and procedure-related factors. While there are myths surrounding the technique, evidence-based practice and individualized treatment plans are essential for optimizing patient outcomes.