



Intradiscal Biacuplasty and Cooled Radiofrequency for Discogenic and Radicular Low Back Pain: A Literature Review

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Introduction

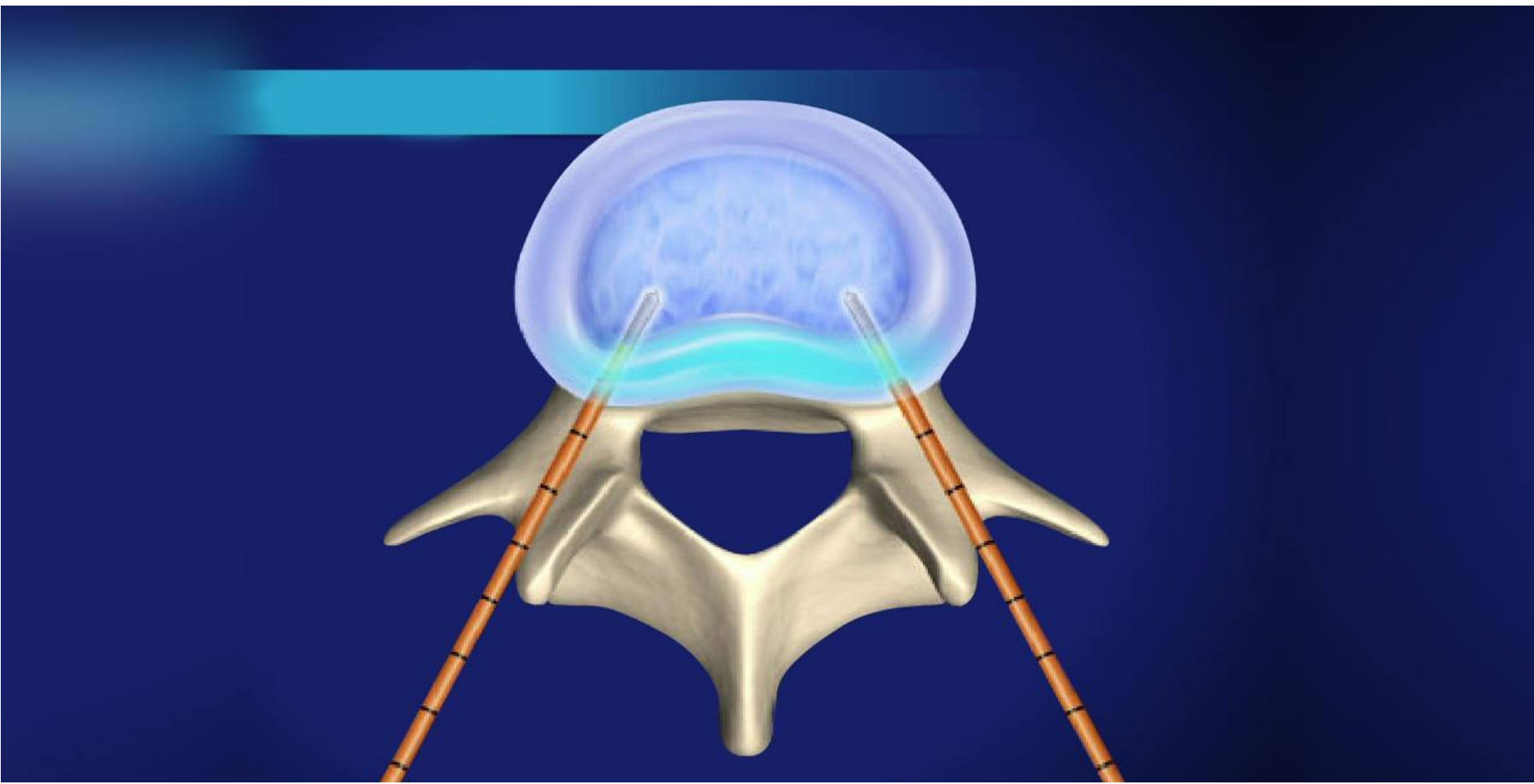
Chronic low back pain is a leading global cause of disability, with discogenic and radicular pain frequently linked to degenerative disc disease. Conventional treatments, including physical therapy, medications, and surgery, offer variable outcomes and often carry opioid-related or procedural risks. Intradiscal biacuplasty (IDB) and cooled radiofrequency treatment (CRT) have emerged as minimally invasive, opioid-sparing alternatives. This review examines current clinical evidence supporting IDB and CRT in the treatment of discogenic and radicular low back pain.

Material and Methods

A targeted review of clinical studies published between 2008 and 2024 was performed, focusing on intradiscal biacuplasty and cooled radiofrequency treatment for chronic low back pain of discogenic or radicular origin. Included studies encompassed pilot trials, randomized controlled trials and prospective cohort designs. Literature was sourced primarily through peer-reviewed pain medicine journals. Primary outcome measures across studies included pain intensity, functional disability, opioid consumption, and patient-reported satisfaction. Priority was given to studies that utilized objective imaging and discography-confirmed inclusion criteria.

Results

- Initial feasibility of intradiscal biacuplasty was demonstrated in a small cohort of patients with discogenic chronic low back pain, where participants experienced a 57% reduction in pain scores and meaningful improvements in disability at 6-month follow-up. These findings were subsequently validated in a larger placebo-controlled randomized trial, which showed significant improvements on the Visual Analog Scale, Oswestry Disability Index and overall quality-of-life measures, with no procedural complications. At 12-month follow-up, benefits were sustained, and patients who crossed over from the placebo group achieved outcomes comparable to those initially treated.
- Independent randomized trials have consistently confirmed IDB’s efficacy, demonstrating statistically significant reductions in pain and disability, as well as improvements in physical function compared to placebo procedures. More recent evidence from a multicenter study further reinforced these findings, showing that patients randomized to IDB reported significantly lower pain and disability scores at all time points when compared to those receiving continued conservative care. Notably, no complications were reported.
- CRT has also shown promise in the management of radicular pain. In patients with MRI-confirmed lumbar disc herniations and chronic radiculopathy unresponsive to physical therapy, CRT resulted in nearly 80% pain reduction and substantial functional improvement, with no serious adverse events.



Conclusions

Current literature supports intradiscal biacuplasty and cooled radiofrequency treatment as safe, minimally invasive options for managing discogenic and radicular low back pain. Trials demonstrate IDB’s superiority over placebo with sustained benefits, while CRT shows promise for radicular syndromes. Given the limitations of opioids and surgery, both modalities warrant earlier consideration in appropriate patients. Future studies should refine patient selection, optimize technique, and assess long-term durability.

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