Dorsal Root Ganglion Stimulation Technique

Attempts to place conventional leads to the area of the foramen have failed because of the size of the lead and improper shape. In prospective multicenter studies, innovative design of a lead to fit around the structure delivered via a novel sheath has proven successful at treating patients with focal complex syndromes that have previously failed both spinal cord and peripheral stimulation ¹⁾.

Cross talk between DRG structures allows for appropriate selection of the target based on best anatomy of the spine. An MRI or CT of the target area should be considered prior to placement with the realization that the target can be modified to improve safety with maintained efficacy²⁾. Trialing of the DRG can be performed via a simple percutaneous method, which was the initial method of approach in the development of the therapy³⁾. Proper training and mentoring allows for efficiency and efficacy in the technique. To date, the therapy has been applied by the percutaneous method in all implants, but current work is ongoing in developing a surgical lead.

Vancamp et al. described several techniques that can be applied to implant cylindrical leads over the Dorsal Root Ganglion (DRG), highlighting some tips and tricks according to our experiences. Focus is mainly shifted toward implantations in the lumbar area. We furthermore give some insights in the results we experienced in Spain as well as some worldwide numbers.

A 14-gauge needle is placed using a "2-Level Technique (2-LT)" or exceptionally a "1-Level Technique (1-LT)" or a "Primary- or Secondary Technique" at the level of L5. The delivery sheath, loaded with the lead, is advanced toward the targeted neural foramen. The lead is placed over the dorsal aspect of the DRG. A strain relief loop is created in the epidural space. Sheath and needle are retracted and the lead is secured using an anchor or anchorless technique. In Spain, 87.2% (N = 78) of the selected patients have been successfully implanted. Seven (8.9%) had a negative trial and three (4.2%) were explanted. Average VAS score decreased from 8.8 to 3.3 and on average 94.5% of the pain area was covered. In our center's subjects (N = 47 patients, 60.3% of all implanted patients in Spain), VAS scores decreased from an average of 8.8-1.7 and pain coverage averaged 96.4%. We used an average of 1.8 electrodes. Worldwide more than 4000 permanent cases have been successfully performed. They presented implantation techniques whereby a percutaneous lead is placed over the DRG through the use of a special designed delivery sheath. Further investigation of the safety, efficacy, and sustainability of clinical outcomes using these devices is warranted ⁴⁾.

Videos

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/FDs4DJeRikM" frameborder="0" allow="accelerometer; autoplay; encrypted-media; gyroscope; picture-in-picture" allowfullscreen></iframe> </html>

Smith et al. presented three patients, each with a different reason in which Dorsal root ganglion stimulation (DRGS) would not be accessible via the traditional anterograde approach, who all had successful DRGS transgrade placement.

The case series includes three patients with either CRPS or post-surgical neuropathic pain who had an anatomical or post-surgical condition that historically would have rendered DRGS contraindicated.

Two patients had previously failed dorsal column stimulation. All three patients had successful placement with the transgrade approach-entry into the contralateral epidural space at the level of the targeted foramen from a cephalad angle. Following treatment with a transgrade approach, all three patients had significant pain relief and improvement in function without complication.

Barriers to anterograde foraminal access including previous implantation, previous instrumentation, and epidural adhesions may prevent DRGS placement in certain indicated patients. This can be especially challenging in patients who have failed other neuromodulation options like dorsal column stimulation ⁵⁾.

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https://www.asra.com/page/227/dorsal-root-ganglion-stimulation

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4)

Smith GL, Petersen EA, Paul C, Goree JH. Transgrade Dorsal Root Ganglion Stimulation as a Salvage Technique for Three Different Anatomical Barriers: A Case Series [published online ahead of print, 2020 Sep 9]. Neuromodulation. 2020;10.1111/ner.13276. doi:10.1111/ner.13276

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