Endoscopic Dorsal Rhizotomy, a New Anatomically Guided MIS Procedure, Is More Effective than Traditional Pulsed Radiofrequency Lesioning for Non-discogenic Axial Back Pain

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Introduction: Radiofrequency lesioning of the medial branch of the lumbar dorsal ramus is the standard interventionalist's method to treat facet joint mediated axial back pain. Its effectiveness is less predictable because of the inability to confirm complete surgical lesioning of the medial branch with dependence on fluoroscopic guidance of electrode placement in locating the targeted nerve. A more effective endoscopically visualized guided technique is introduced.

Method: A prospective non-randomized pilot feasibility study of 50 patients was initiated in 2006-2007 to assess the effect of endoscopic radiofrequency lesioning of the medial branch. A 90% Excellent/Good result was obtained, VAS 6.2-2.5, and ODI 48-28 with a one year follow-up. The endoscopic procedure also provided the capability to expose and target the intermediate and lateral branch of the lumbar dorsal ramus. Patients with lumbar spondylosis and facet arthrosis on MRI presented with predominant axial back pain and had at least 50% pain relief by medial branch blocks met the inclusion criteria. The study was extended to this updated report, while modifications of the surgical technique evolved, based on continued study of cadaver dissections identifying variable anatomy of the branches of the dorsal ramus. The study sample now total 205 patients.

Results: All patients experiencing relief of back pain with medial branch blocks had equal or greater pain relief with dorsal endoscopic rhizotomy. Patients selected for repeat endoscopic lesioning who had minimal relief with radiofrequency lesioning were also satisfactory. Pre- and post-op VAS decreased an average of 4 points and Oswestry scores decreased 30%. No patient was worse. No permanent complications, although a few patients experienced mild temporary dysesthesia. At 1-3 year follow-up, 6 patients experiencing partial return of their axial back pain requested repeat rhizotomy. They experienced similar, but lesser improvement from the index procedure. Rhizotomy of the upper lumbar facets were not as consistent nor better than relief received from medial branch blocks at the lower lumbar spine from L3-S1.

Discussion: Modification of the original surgical technique since 2006 was instituted after cadaver dissection of 5 specimens, offering 10 additional levels for study, demonstrated considerable variability in different cadaver specimens. In the upper lumbar spine, especially from L1 and L2, the standard anatomic relationships did not hold up. We were not able to find the medial branch to the facet as consistently as explained in the spine literature. The nerve to the facet joint, because it is more cephalad to the transverse process, did not traverse the transverse process as it would in the lower lumbar spine. Nerve Ablation at these two levels may require lesioning of the dorsal ramus or targeting the medial branch on the facet capsule. The side firing laser provides ready access to the lateral facet capsule. A newly designed bi-tip bipolar probe for facilitated soft tissue ablation.

Conclusion: Endoscopically guided rhizotomy provides more consistent ablation of the medial and lateral branches of the lumbar dorsal ramus. A more consistent and surgically effective technique provides more surgical options and better, longer lasting results. The variations in the location of facet innervation as demonstrated in cadaver dissections dictates a need for visually guided endoscopic MIS surgery.