Technical Efficacy of a Direction Specific Radiofrequency Device in the Performance of Lumbar Medial Branch Neuromoty – An MRI and EMG Confirmation Study (Interim Analysis)

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Background/Objectives: Lesion position and geometry are cardinal in maximizing safety and efficacy when performing lumbar medial branch radiofrequency ablation (LMBRA). Technical efficacy of a multi-tined expandable electrode (MEE), with perpendicularly spaced tines, was demonstrated using a novel LMBRA validation protocol and correlated with paraspinous EMG (PEMG) findings in this IRB approved study.

Methods: Patients (n=6 MRI, n=5 EMG) chosen for LMBRA underwent pre and post LMRI and PEMG[1]. Post-ablation LMRI using a previously described[2] protocol was obtained 7 days following RFA and used to quantify lesion size and provide lesion topography and anatomic relationship information. Post-LMBRA EMG was obtained at 3-6 weeks. Monitoring of possible complications was carried out.

Results: Lesions were achieved, incorporating the target MB/SAP wall, in all cases[3]. Mean lesion volume was 601.7 mm³ (n=10, 95% CI: 522.6, 680.8). No bone edema or complications were noted. EMG evidence of target medial branch ablation was achieved in 88% (n=34, 95% CI: 77-99) of targets which compares favorably with EMG % ablation of Dreyfuss, et al [3] of 90.5%. *One subject underwent repeat procedure, adding one additional MRI/EMG positive ablation site – included in these results. There were no complications.

Comments: Post-LMBRA LMRI, supported by PEMG, was used to demonstrate technical efficacy and safety of a multi-tined expandable RF electrode, using a new technique (perpendicular approach) that simplifies this ablative procedure for this common target. This validation method is an extension of all ex-vivo RF work done to date, and may be used for future research, as well as being a useful tool for educational purposes.


Comparison of Lumbar Facet Radiofrequency Neurotomy Using a Conventional Monopolar versus Multitined Electrode

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Background: strategies to expand radiofrequency (RF) lesion size to accommodate medial branch nerve location variability include multiple lesions using a conventional monopolar electrode and the use of a multitined (Nimbus) electrode. Objective: to compare the effect of electrode type (conventional monopolar versus multitined) on relief of pain and disability, procedure time and fluoroscopy exposure.

Methods: 25 consecutive patients underwent lumbar facet RF using a single multitined thermal lesion per medial branch nerve. Each had previously undergone successful lumbar facet RF using 2 conventional monopolar lesions over the same medial branch nerves. Prospectively gathered Pain Disability Questionnaire (PDQ) scores were recorded prior to and at 2 months post RF for both groups and at 6 months post RF for the multitined electrode group. RF procedure duration and fluoroscopy times were also recorded. Data were analyzed using Analysis of Variance. Results: PDQ scores dropped significantly and comparably at 2 months post RF in both the monopolar and multitined electrode groups [pre:post mean(sd) scores - monopolar 28.8(5.5):11.6(6.1); multitined 28.6(5.6):11.0(6.7)]. The 6 month post RF PDQ score remained significantly improved in the multitined group [14.9(7.5)]. Pain scores also dropped significantly and comparably in both groups [pre:post mean(sd) scores - monopolar 6.4(1.8):2.6(1.4); multitined 6.3(1.6):2.3(1.4)]. The 6