**Gait Analysis in Patients Treated for Lumbar Spondylosis**

**Primary Author:** Cale White  
University Of Arkansas for Medical Sciences

**Co-Authors:** Daniel Judkins, M.D.; Erika Petersen, M.D.; Johnathan Goree, M.D.; Tuhin Virmani, M.D., Ph.D.;

**Background.** Radiofrequency ablation (RFA) of the medial branches has been proven to be an effective treatment for lumbar spondylosis. This is based on findings from subjective data like Visual Analog Scale and Oswestry Disability Index[1]. While many patients with this condition present with pain as their chief complaint, they also often complain of decreased function and difficulty with standing and ambulation. Multiple studies in the neurology literature have used pressure sensor impregnated mats like the Zeno Walkway as an effective and efficient means to gather data on a subject’s gait[2]. In this study we identified patients with lumbar spondylosis and analyzed if there was objective functional benefit to RFA treatment by comparing their gait using the Zeno Walkway before and after treatment.

**Methods.** After IRB approval, Patients were identified who presented with lumbar spondylosis at the University of Arkansas for Medical Sciences Interventional Pain clinic. They were then given the option to participate in the study if they fit inclusion criteria. Each patient received two confirmatory lumbar medial branch blocks followed by RFA of the medial branches in the lumbar spine. All patients completed the Pain Disability Index questionnaire and the Oswestry Disability Index questionnaire before and after treatment. Each patient also underwent gait analysis on the Zeno Walkway before and after treatment. Gait data was analyzed using PKMAS Protokinetic Movement Analysis Software. Gait parameters analyzed include stride velocity, stride width, stride length, stride common variance, stride velocity common variance, stride length common variance. A total of 17 Subjects completed the study.

**Results.** The pre-RFA data was directly compared to the Post-RFA data using Paired two tailed T-test. Based on the Pain Disability Index and the Oswestry Disability Index the study patients showed statistically significant improvement (p = 0.0007 and p= 2.3E-5 respectively). Patients showed no significant changes in the Parameters of common variance of stride length, mean stride width, common variance of stride width. After RFA treatment the patients did show an average increase in stride velocity of 7.366 cm/s with a P value of 0.0384. The stride length showed an increase of 5.952 cm with a P value of 0.0618. If the four individuals who did not show improvement based on the Pain disability index are removed, then the stride length increased by 8.67 cm and the P value was 0.0298.

**Conclusions.** While there is subjective data validating the use of RFA of medial branch nerves in the treatment of lumbar spondylosis, there is a shortage of objective data that demonstrates that this treatment leads to clinical improvement. Based on our preliminary study, we have found that RFA leads to improvement of stride velocity. We believe that this objective data further confirms our subjective information on the validity of this treatment. While stride length was not significantly
different, the data does present a trend that RFA treatment of Lumbar spondylosis can lead to increased stride length, especially since those who reported pain improvement did show a statistically significant stride length increase. Further investigation will need to be performed to understand the extent of the impact RFA treatment has on Stride length and the other variables that were selected for study.
