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Reduced tibial nerve movement in people with postoperative residual leg symptoms following decompression for spinal stenosis

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Introduction: Surgical intervention for lateral recess syndrome, a variant of spinal stenosis and results in global decompression is cost effective and largely successful. However, a number of studies reported postoperative residual leg pain in 17-41% people with lateral recess syndrome following decompression. This results in continued pain and functional despite after a successful surgery.

Methods: Sixteen participants with postoperative residual leg symptoms following decompression for spinal stenosis were recruited. An innovative ultrasound imaging technique has been developed to quantify the tibial nerve movement at the knee level during forward bending movement. The range of motion of the lumbar spine and hip were also measured simultaneously by accelerometers, which were placed on the L1, S2 and bilateral thighs.

Results: Paired t-test showed that in people with residual leg pain (N=16), there was a statistically significant reduction in tibial nerve movement on the painful side (mean: 2.2 ± 2.1 mm) compared with the non-painful side (mean: 4.4 ± 2.4 mm) ($p < 0.05$) during the limited lumbar flexion during forward bending ($32.1^\circ \pm 13.5^\circ$). The results suggested that decreased tibial nerve movement may contribute to the continued postoperative residual radiating pain even when the spinal disorders have been treated successfully by surgical intervention.

Conclusion: The observed limited tibial nerve movement could be a consequence of prolonged immobilization prior to spinal surgery, leading to the shortening, adhesion and thus decreased movement of the sciatic and tibial nerve. Intervention should be developed to mobilize and stretch the sciatic and tibial nerve in patients with residual postoperative leg pain following spinal surgery.

Biography

Gary Shum gained his PhD in Biomechanics from University of Sydney, Australia. He is an Associate Professor at University of St Mark & St John, United Kingdom and Honorary Associate Professor at the Exeter Spinal Unit, Princess Elizabeth Orthopedic Centre, Royal Devon and Exeter NHS Foundation Trust, United Kingdom. He is a Chartered Physiotherapist and his main research interests are in musculoskeletal and sports biomechanics including inverse dynamics, gait analysis, ultrasound imaging and rehabilitation research. He has been serving as an Editorial Board Member of *Journal of Spine* since 2014.

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