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outcome measures. The remaining 11 reported successful outcomes and an average pain reduction of 4 on the visual analog scale. The majority of patients reported a decrease in analgesic use after peripheral nerve field stimulation. Pain relief was significantly and highly correlated with reduced analgesic intake and patient satisfaction. No adverse events or complications were reported.

Conclusion: This study demonstrates PNFS is a potential treatment option that is safe, reversible and effective for patients with chronic low back pain that have exhausted other treatment options.

Injectable Adult Stem Cells as a Novel Therapeutic Platform for Anterior and Posterior Spinal Fusion

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Introduction: Spinal fusion has become a popular surgical technique used to provide segmental fixation of the spine. We have previously shown that stem cell-based therapy using safe, nonvirally genetically engineered adult stem cells (ASCs), that express bone morphogenetic protein (BMP) genes, could induce bone formation *in vivo*. Therefore, we hypothesized that primary adult stem cells, nucleofected with human BMP-6 gene, directly injected into the intervertebral disc or its vicinity could induce posterior or anterior spinal fusion.

Methods: Porcine ASCs were isolated from freshly harvested adipose tissue. Over expression of hBMP-6 was achieved using nucleofection, an electroporation-based technique. Engineered ASCs were labelled with *luciferase* or green fluorescent protein marker genes prior to injection. Twenty-four hours post nucleofection, the cells were injected into the caudal intervertebral disc of immunodeficient rats or into the lumbar paraspinal muscle of immunodeficient mice. Spinal fusion was monitored using real time, noninvasive micro-computed axial tomography, *in vivo*. Cell survival was monitored on tissue level using a noninvasive, quantitative, bioluminescence imaging system, and on cellular level using a novel *in vivo* fibered confocal microscope.

Results: ASCs survived at least 2 weeks *in vivo* as demonstrated by quantitative bioluminescence and fluorescence imaging. Quantitative uCT analyses demonstrated

extensive bone formation in the paraspinal sites and in the disc region, leading to interbody fusion.

Conclusions: We report a novel, safe, injectable, and well-monitored system for the induction of posterior and anterior spinal fusion using engineered primary ASCs. These results may provide a novel biological therapeutic platform for spinal fusion.

Sphenopalatine Ganglion Block Compared with Stellate Ganglion Block in Patients with Traumatic Trigeminal Neuralgia

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Objectives: Neuropathic trigeminal pain has responded to sympathetic blockade. Long term response to stellate ganglion block is inconsistent. Sphenopalatine ganglion block may offer a better outcome in neuropathic trigeminal pain because of the parasympathetic fibers and sensory fibers that can be targeted.

Methods: Patients diagnosed with traumatic trigeminal neuralgia were treated with stellate ganglion block. If they responded, a second block was performed. Response was determined as positive if the reduction in pain on visual analog scale was greater than 60%. If they did not have long-term relief greater than 4 months, they were given a sphenopalatine ganglion block. The sphenopalatine ganglion block was repeated if response was greater than 60% pain reduction.

Results: Twenty-six patients fulfilled the criteria for traumatic trigeminal neuralgia. There were 17 females (65.3%) and nine males (34.6%). Pain was localized to V1 in 42.3%, V2 in 42.3%, and V3 in 42.3%. Seventeen patients had stellate ganglion blocks. Twelve out of these 17 patients (70.5%) responded to the first block and 12/17 (70.5%) responded to the second block. The longest duration of relief was 4 months. Average duration of relief was 36 hours. Sphenopalatine ganglion blocks were performed on the 12 that responded to stellate ganglion blocks and 14 additional patients. All 12 patients who responded to stellate blocks also responded to two sphenopalatine blocks, and eight of the additional 14 responded as well, with a total of 20 out of 26 responding (76.9%) to sphenopalatine blocks.

Conclusion: Sphenopalatine block provides equivalent relief for traumatic trigeminal neuralgia as compared to stellate ganglion block. The advantage of sphenopalatine block may be to offer a permanent treatment option with gamma knife radiation targeting the sphenopalatine ganglion, which could not be performed with the stellate ganglion.