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“Peripheral Nerve Stimulation for Chronic Refractory Knee Pain: A Retrospective Case Series”

Introduction: Chronic refractory knee pain secondary to advanced osteoarthritis (OA) or persistent pain following total knee arthroplasty (TKA) can be difficult to manage. Peripheral nerve stimulation (PNS) is a minimally invasive, nonopioid treatment option, but evidence regarding its effectiveness and durability remains limited.

Objectives: This study evaluated pain reduction, progression to permanent implantation, and treatment durability following PNS targeting the three deep geniculate nerves in patients with advanced knee OA or persistent pain following TKA.

Methods: This retrospective case series included 52 adults with chronic refractory knee pain who underwent PNS targeting the three deep geniculate nerves between February 2023 and September 2025. Temporary leads were placed under fluoroscopic guidance for a two-week trial, after which patients with clinically meaningful pain relief were eligible for permanent implantation. Pain was assessed using visual analog scale (VAS) scores before and after trial stimulation. Procedural progression and follow-up outcomes were also evaluated. Pre- and post-trial VAS scores were compared using the Wilcoxon signed-rank test.

Results: Of 52 patients undergoing PNS trial, 42 (80.8%) proceeded to permanent implantation. Median VAS decreased from 8 (IQR, 8–10) before trial stimulation to 2 (IQR, 1–4) afterward ($p < 0.0001$), a 75% reduction. Among permanently implanted patients, 33/42 (78.6%) had follow-up pain assessments. Fourteen of 33 (42.4%) with no alternative treatment or repeat PNS had a median VAS of 2 at a median follow-up of 94.5 days. Five underwent repeat permanent PNS at a median of 220 days. Fourteen of 33 (42.4%) returned to baseline pain at a median of 57.5 days, and 10 subsequently underwent alternative treatment.

Conclusion: PNS targeting the deep geniculate nerves was associated with substantial initial pain reduction and a high rate of permanent implantation in patients with chronic refractory knee pain. Further prospective studies are needed to characterize long-term durability and identify factors associated with sustained treatment success.