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*"A Randomized Controlled Trial Comparing the Efficacy of a Three-Point Versus a Six-Point Genicular Nerve Radiofrequency Ablation for Chronic Knee Osteoarthritis"*

Knee osteoarthritis (KOA) is a leading cause of chronic knee pain and disability, with a lifetime prevalence of 45%. While treatment for symptomatic KOA includes physical therapy, oral anti-inflammatory medications and intra-articular steroid injections, the definitive treatment is total knee arthroplasty. However, approximately 600 000 fewer surgeries were performed in the first three months of the COVID pandemic which has created an overwhelming backlog of patients awaiting elective surgical management. The significant delays caused by the backlog in surgery are leading to worsened pain requiring increased opioid use, functional impairment, and psychological well-being of patients. Therefore, the use of fluoroscopy-guided genicular nerves radiofrequency ablation (GNRFA) has become a valuable treatment option for patients either awaiting arthroplasty or are ineligible for arthroplasty due to comorbidities or for personal preference.

GNRFA uses thermal energy to percutaneously create lesions in neural tissues of the genicular nerves that innervate the anterior knee capsule and disrupt the conduction of pain signals. Classically, the three branches of the genicular nerve that are targeted in this procedure include the superolateral genicular nerve (SLGN), superomedial genicular nerve (SMGN) and the inferomedial genicular nerve (IMGN)

Subsequently, the safety of GNRFA in the management of KOA and its greater efficacy compared to other options including intraarticular steroid injections, viscosupplementation and oral analgesics has been replicated in several large clinical studies, leading to its wide adoption.

The anterior knee capsule is innervated by 10 nerves; unfortunately, not all of them can be targeted percutaneously. Recent anatomic validation studies, though, have revealed three additional nerves that are suitable targets under fluoroscopy with bony landmarks. These include the two branches from the nerve of vastus intermedius (VIN), and the recurrent fibular nerve (RFN). Consequently, we described the six- nerves target that includes the RFN, and the two branches of the VIN in addition to the conventional three targets. **Our retrospective clinical experience already published has shown that six nerves-target, when compared to three nerves-target, significantly improved pain and functional outcomes at one-month, three-month, and six-month intervals.** No randomized controlled trials have included the addition of the RFN and the lateral and medial branches of the VIN. This has led to the suboptimal treatment of the anterior knee, especially the sub patellar plexus and the anterior lateral knee capsule.

Our preliminary research has demonstrated the safety and efficacy of our six nerves-target technique. Additionally, we have shown that adding more nerves to the conventional GNRFA produces better long-term results in pain and function. Our current research is based on bringing level 1 evidence for using our six-nerves-target technique, and we will prospectively evaluate this technique with the current standard of care three-nerves-target GNRFA. We believe that the clinical benefits of our six-nerve target technique will consolidate genicular nerve radiofrequency in managing severe knee pain by KOA. Additionally, it will change clinical practice, reinforcing the need to add three more nerves to GNRFA protocols and management guidelines for this procedure.