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Genicular Nerve Blocks for the Management of Chronic Knee Pain Related to Osteoarthritis – A Case Series

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Chronic knee pain from osteoarthritis (OA) is a leading cause of disability, with limited treatment options for patients who fail conservative management and intra-articular (IA) injections. Genicular nerve blocks (GNBs) have emerged as a promising treatment for chronic knee pain, especially in patients who are not candidates for total knee replacement (TKR). This case series discusses six patients with chronic knee pain from OA who failed conventional treatments, including IA injections, and found significant relief with GNBs.

INTRODUCTION

Osteoarthritis (OA) of the knee is one of the most common causes of chronic knee pain, affecting millions worldwide.¹ This degenerative condition leads to cartilage breakdown, joint inflammation, and chronic pain, often resulting in reduced mobility and quality of life. First-line treatments typically include conservative measures such as physical therapy (PT), home exercise programs (HEP), and medications including non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen.^{2,3} For patients with moderate to severe OA, IA injections of corticosteroids or hyaluronic acid are frequently used to provide temporary relief.^{3,4}

However, many patients either fail to achieve adequate pain control with these treatments or are not suitable candidates for surgical interventions like TKR due to medical or personal reasons. In such cases, genicular nerve blocks (GNBs) have gained popularity as a non-surgical option for targeted pain relief. GNBs, which involve injecting local anesthetic with/without steroids around the genicular nerves that supply the knee, can provide significant pain relief by interrupting pain signals from the knee joint.⁵⁻⁷ Radiofrequency ablation (RFA) can also be used for more prolonged relief.^{8,9} This case series discusses the outcomes of six patients who received GNBs for chronic knee pain after failing other treatment options.

CASE SERIES

Patient 1: A 65-year-old female with a BMI of 52 presented with bilateral knee pain due to OA. She had previously failed PT/HEP, NSAIDs, acetaminophen, and duloxetine. Due to her elevated BMI, she was not considered a candidate for TKR. After receiving bilateral GNBs, she reported 100% pain relief, which lasted for 11 weeks.

Patient 2: A 61-year-old female with a BMI of 47 complained of right knee pain from OA. She had not responded to PT/HEP, NSAIDs, acetaminophen, gabapentin, and tramadol. Like the first patient, she was not a candidate for TKR because of her BMI. Following a right-sided GNB, she experienced 80% pain relief, which persisted for 12 weeks.

Patient 3: A 69-year-old female with a BMI of 35 presented with left knee pain from OA. She declined TKR surgery despite failing PT/HEP, NSAIDs, and acetaminophen with codeine. After receiving a left-sided GNB, she reported 100% pain relief, which lasted for 12 weeks.

Patient 4: A 77-year-old female with a BMI of 27 reported left knee pain secondary to OA. She had previously failed PT/HEP, NSAIDs, acetaminophen, and topical diclofenac. She declined surgical intervention due to her advanced age. Following a left-sided GNB, she experienced 100% pain relief, lasting for 15 weeks.

Patient 5: A 70-year-old male with a BMI of 54 presented with bilateral knee pain due to OA. He had failed PT/HEP, NSAIDs, gabapentin, cyclobenzaprine, tramadol, and topical diclofenac. Given his BMI, he was not a candidate for TKR. After bilateral GNBs, he experienced 75% relief, lasting for 11 weeks.

Patient 6: A 68-year-old male with a BMI of 41 presented with right knee pain from OA. Despite trying PT/HEP, NSAIDs, acetaminophen, tramadol, and hydrocodone, he did not achieve adequate relief. He was not interested in surgical intervention. After receiving a right-sided GNB, he experienced 80% pain relief for 12 weeks.

All genicular nerve blocks were performed with corticosteroids. For each knee, 30 mg of triamcinolone was used, with 10 mg of triamcinolone along with 1 mL of local anesthetic injected along each of the superior medial, superior lateral, and inferior medial genicular nerves. For patients who received bilateral genicular nerve blocks, a to-

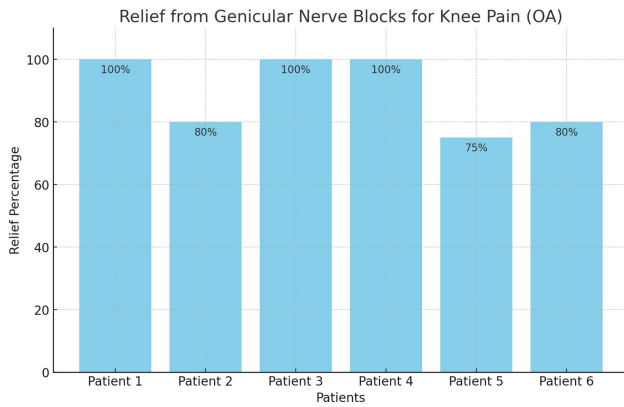


Figure 1. Demonstrates the percentage of relief experienced by each patient after genicular nerve blocks.

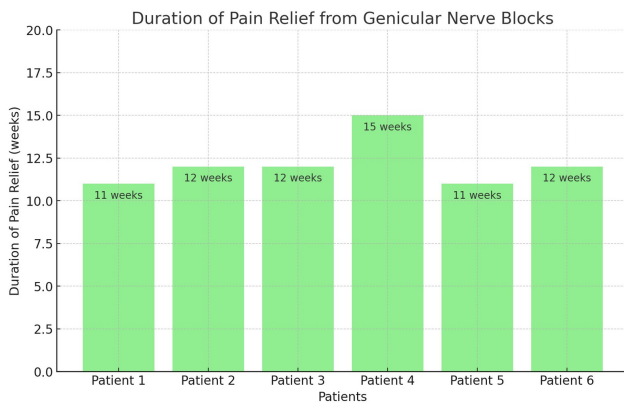


Figure 2. Demonstrates the duration of relief experienced by each patient after genicular nerve blocks.

tal of 60 mg of triamcinolone was administered, with 30 mg being used per knee.

The patient outcomes after receiving genicular nerve blocks are visually represented in the graphs below.

DISCUSSION

Chronic knee pain from osteoarthritis (OA) is a complex and multifactorial condition that can be particularly challenging to manage, especially in patients who do not respond to conventional treatments. OA-related pain arises from a combination of factors, including joint inflammation, cartilage degeneration, and altered biomechanics, which can contribute to both localized and referred pain. Initial management typically includes conservative interventions, with physical therapy (PT) and home exercise programs (HEP) being first-line strategies.² These interventions aim to enhance joint strength, improve mobility, and restore function, while also addressing mechanical imbalances that exacerbate pain. However, while PT and HEP can be effective for some, many patients do not experience sufficient relief from these approaches alone.^{2,3}

Medications such as non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen are often employed for symptomatic relief. These drugs can reduce inflammation and alleviate pain, making them common choices in OA management.³ However, long-term use of NSAIDs, in particular, is associated with significant side effects, including gastrointestinal complications such as ulcers and bleeding, as well as renal impairment. This limits their use in some patient populations, especially the elderly or those with comorbidities. Acetaminophen, while often considered safer, is generally less effective for severe pain, and excessive use carries risks of liver toxicity.

For patients with moderate to severe OA who have not found adequate relief from conservative measures, intra-articular (IA) injections of corticosteroids or hyaluronic acid are frequently used as the next step in treatment.^{3,4} Corticosteroids work by reducing inflammation within the joint, while hyaluronic acid acts as a lubricant to improve joint function and potentially slow degeneration. However, the effects of these injections are often temporary, and many patients require additional or alternative treatments to manage their chronic pain over the long term. The duration of relief from IA injections can vary widely, and some patients experience little to no benefit.

In cases where conservative treatments and IA injections fail, genicular nerve blocks (GNBs) offer a minimally invasive, non-surgical option for pain management. The genicular nerves supply sensory innervation to the knee joint.⁵⁻⁷ By targeting these nerves with a combination of local anesthetics and corticosteroids, pain signals can be disrupted, providing significant relief. In this case series, patients reported between 75% and 100% pain relief after GNBs, with relief durations ranging from 11 to 15 weeks. This treatment can be particularly valuable for patients who are not candidates for total knee replacement (TKR) due to factors such as high body mass index (BMI), comorbidities, or personal preference.

For patients seeking longer-lasting relief, radiofrequency ablation (RFA) of the genicular nerves can be considered following successful diagnostic GNBs.^{8,9} RFA disrupts the ability of these sensory nerves to transmit pain signals for an extended period. This approach is particularly beneficial for patients who are unable or unwilling to undergo surgical interventions, such as TKR. By offering a less invasive alternative, GNBs followed by RFA present a valuable option in the continuum of care for managing chronic knee pain associated with OA.

CONCLUSION

Genicular nerve blocks with steroids are an effective treatment option for patients with chronic knee pain related to OA, particularly those who have failed conservative management and IA injections. The patients in this case series reported substantial pain relief, lasting from 11 to 15 weeks. GNBs can be used as a bridge therapy or an alternative for patients who are not candidates for TKR. For longer-lasting relief, RFA may be considered following successful GNBs. These findings highlight the importance of

individualized treatment approaches for managing chronic knee pain. Further research is needed to explore the long-term efficacy and safety of GNBs in this patient population.

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REFERENCES

1. Cross M, Smith E, Hoy D, et al. The global burden of hip and knee osteoarthritis: estimates from the global burden of disease 2010 study. *Ann Rheum Dis*. 2014;73(7):1323-1330. doi:[10.1136/annrheumdis-2013-204763](https://doi.org/10.1136/annrheumdis-2013-204763)
2. Luan L, El-Ansary D, Adams R, Wu S, Han J. Knee osteoarthritis pain and stretching exercises: a systematic review and meta-analysis. *Physiotherapy*. 2022;114:16-29. doi:[10.1016/j.physio.2021.10.001](https://doi.org/10.1016/j.physio.2021.10.001)
3. Gress K, Charipova K, An D, et al. Treatment recommendations for chronic knee osteoarthritis. *Best Pract Res Clin Anaesthesiol*. 2020;34(3):369-382. doi:[10.1016/j.bpa.2020.06.006](https://doi.org/10.1016/j.bpa.2020.06.006)
4. Webner D, Huang Y, Hummer CD 3rd. Intraarticular Hyaluronic Acid Preparations for Knee Osteoarthritis: Are Some Better Than Others? *Cartilage*. 2021;13(1_suppl):1619S-1636S. doi:[10.1177/19476035211017320](https://doi.org/10.1177/19476035211017320)
5. Shanahan EM, Robinson L, Lyne S, et al. Genicular Nerve Block for Pain Management in Patients With Knee Osteoarthritis: A Randomized Placebo-Controlled Trial. *Arthritis Rheumatol*. 2023;75(2):201-209. doi:[10.1002/art.42384](https://doi.org/10.1002/art.42384)
6. Tan YL, Neo EJR, Wee TC. Ultrasound-guided Genicular Nerve Blockade With Pharmacological Agents for Chronic Knee Osteoarthritis: A Systematic Review. *Pain Physician*. 2022;25(4):E489-E502.
7. Güler T, Yurdakul FG, Önder ME, et al. Ultrasound-guided genicular nerve block versus physical therapy for chronic knee osteoarthritis: a prospective randomised study. *Rheumatol Int*. 2022;42(4):591-600. doi:[10.1007/s00296-022-05101-8](https://doi.org/10.1007/s00296-022-05101-8)
8. Fitzpatrick B, Cowling M, Poliak-Tunis M, Miller K. Effect of Genicular Nerve Radiofrequency Ablation for Knee Osteoarthritis: A Retrospective Chart Review. *WMJ*. 2021;120(2):156-159.
9. Soetjahjo B, Adriansyah D, Yudistira MB, Rahman AN, Herman H, Diwan S. The Analgesic Effectiveness of Genicular Nerve-targeted Cooled and Pulsed Radiofrequency Ablation for Osteoarthritis Knee Pain: A Systematic Review and Meta-analysis. *Pain Physician*. 2024;27(7):357-373.