"The Role of Genicular Nerve Blocks in Enhancing Postoperative Pain Management After Total Knee Arthroplasty: A Retrospective Study."

Mr Aasif Ah Dar[1], Mr Zubair Rashid[2], Mr Jasir Ah Bhat[3] ("The Role of Genicular Nerve Blocks in Enhancing Postoperative Pain Management After Total Knee Arthroplasty: A Retrospective Study.")

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Abstract:

Background: Significant pain after surgery following total knee arthroplasty (TKA) frequently affects satisfaction for patients along with recovery.Traditional analgesic methods include local infiltration analgesia **(LIA)** and peripheral nerve blocks. Genicular Nerve Blocks **(GNB)** have emerged as a potential alternative, targeting articular branches while preserving motor function.

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Objective: To evaluate the efficacy of **GNB** in postoperative pain management following **TKA** compared to **LIA**, focusing on pain scores, opioid consumption, and functional outcomes.

Methods: A retrospective analysis was conducted on patients undergoing **TKA**. Two groups were compared: one receiving ultrasound-guided **GNB** and the other receiving standard **LIA**. Pain scores during equilibrium and movement, using narcotics within 24 hours, time to mobility and duration of hospitalization were the main findings.

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Results:

Within the first 24 hours after surgery, patients who received GNB reported a reduction in pain during activity and at relax. The GNB group consumed much fewer opioids. In

comparison to the LIA group, these patients also attained mobility faster. There was no discernible variation in the duration of hospitalization between the groups.

Conclusion:

In TKA, genicular nerve blocks provide a safe, efficient, and motor-sparing substitute for conventional analgesic techniques, improving postoperative pain control and encouraging quicker mobility. GNB may enhance satisfaction and results for patients when incorporated into multimodal analgesia strategies.

Introduction:

A frequent surgical treatment for end-stage osteoarthritis in the knee is total knee arthroplasty. For patients to recover, rehabilitate, and be attained, effective postoperative treatment of pain is essential with surgery all depend on efficient operative management of pain. The drawbacks of conventional techniques like blocking peripheral nerves and LIA include uneven pain management and motor impairment. GNB is a motor-sparing option that may improve postoperative results by focusing on the knee's articulating regions.

[PubMed Central+1 PubMed+1]

Methods:

A primary care facility reviewed the medical records of patients who had total knee arthroplasty (TKA) between January 2023 and December 2024 as part of a retrospective investigation. ASA grading between I&II, Patients between the ages of 50 and 80 undergoing primary unilateral TKA were included in the inclusion criteria.

Patients were divided into two groups:

GNB Group: Received ultrasound-guided GNB targeting the superomedial, superolateral, and inferomedial genicular nerves with 0.25% bupivacaine and dexamethasone.

[Wiley Online Library +2 PubMed+2 PubMed Central+2]

LIA Group: Received standard periarticular infiltration with a mixture of local anesthetics and analgesics.

[PubMed+1 Acta Orthopaedica+1]

Primary outcomes measured were pain scores using the Visual Analog Scale (**VAS**) at rest and during movement at 6, 12, and 24 hours postoperatively, total opioid consumption in morphine milligram equivalents (**MME**) within 24 hours, time to first ambulation, and length of hospital stay. PubMed

Results:

A total of 100 patients were analyzed, with 50 in each group.

[Lippincott Journals+3, Acta Orthopaedica +3, Lippincott Journals+3]

Pain Scores: The GNB group reported significantly lower **VAS** scores at all measured intervals compared to the **LIA** group.

Acta Orthopaedica+1 PubMed Central+1

Opioid Consumption: Mean opioid consumption in the GNB group was 25 MME, compared to 45 MME in the LIA group ($p < 0.01$).

Ambulation: Patients in the GNB group ambulated approximately 6 hours earlier than those in the LIA group ($p < 0.05$).

Hospital Stay: There was no discernible difference between the two groups' hospital stays.

Discussion:

The findings suggest that **GNB** provides superior postoperative pain control compared to **LIA**, with reduced opioid requirements and earlier mobilization. These benefits may be attributed to the targeted analgesia of **GNB**, sparing motor function and facilitating rehabilitation. The lack of difference in hospital stay indicates that while **GNB** improves immediate postoperative outcomes, other factors influence discharge timing.

The retrospective design and possible selection biases are among the limitations. To validate these results and create uniform procedures for GNB in TKA, prospective, randomized studies are necessary in the future.

Conclusion:

Genicular Nerve Blocks offer an effective and motor-sparing alternative to traditional analgesic methods in **TKA**, enhancing postoperative pain management and promoting earlier ambulation. Incorporating **GNB** into multimodal analgesia protocols may improve patient outcomes and satisfaction.

Refrences:

1. **Ultrasound-Guided Genicular Nerve Blocks Following Total Knee Arthroplasty:**

A Randomized, Double-Blind, Placebo-Controlled Trial

This study demonstrated that adding GNB to a standard analgesic regimen significantly reduced opioid consumption at 24 and 48 hours postoperatively.

[Actaorthopaedica.be+4 PubMed +4 PubMed +4.]

2. **Ultrasound-Guided Genicular Nerves Block:**
   An Analgesic Alternative to Local Infiltration Analgesia for Total Knee Arthroplasty: A Noninferiority, Matched Cohort Study

Findings indicated that **GNB** is non-inferior to local infiltration analgesia (**LIA**) concerning pain control and opioid consumption within the first 24 hours post-surgery.

[PubMed +1, Lippincott Journals]

3. **Intraoperative Landmark-Based Genicular Nerve Block Versus Periarticular Infiltration for Postoperative Analgesia in Total Knee Arthroplasty:**
   A Randomized Non-Inferiority Trial
   The study concluded that landmark-based **GNB** provides non-inferior resting pain relief compared to periarticular infiltration but did not establish non-inferiority for pain during movement. [PubMed +1 Actaorthopaedica.be]
4. **Comparison of Genicular Nerve Block in Combination With Adductor Canal Block in Both Primary and Revision Total Knee Arthroplasty:**
   A Retrospective Case Series
   This retrospective study suggested that combining **GNB** with adductor canal block may enhance postoperative analgesia and reduce opioid requirements in both primary and revision **TKA** patients. [PubMed +1 PubMed +1]
5. **Pain Management Following Simultaneous Bilateral Total Knee Arthroplasty:**
   Genicular Nerve Blockade Versus Periarticular Injection
   In a bilateral **TKA** setting, **GNB** provided superior pain control during the first postoperative day compared to periarticular injection, as evidenced by lower Visual Analog Scale (**VAS**) scores. [Actaorthopaedica.be.]
6. **Ultrasound-Guided Genicular Nerve Blocks for Pain Management Following Total Knee Replacement:**
   A Narrative Review
   This review highlights that **GNB** effectively controls postoperative pain, reduces opioid consumption, and preserves motor function, facilitating earlier mobilization. [PubMed.]
7. **Ultrasound-Guided Genicular Nerve Block for Pain Control After Total Knee Replacement:**
   Preliminary Case Series and Technical Note
   A preliminary case series demonstrating that low-volume, ultrasound-guided **GNB** can provide effective periarticular analgesia post-**TKA**.
   [PubMed +5 PubMed +5 Actaorthopaedica.be +5.]
8. **Genicular Nerve Block for Postoperative Pain Relief After Total Knee Replacement**
   A case report describing successful use of ultrasound-guided 3-point GNB for managing postoperative pain following TKA. [PubMed.]
9. **A Comparison of Genicular Nerve Treatment Using Either Radiofrequency or Analgesic Block with Corticosteroid for Pain After a Total Knee Arthroplasty:**
   A Double-Blind, Randomized Clinical Study
   This study compared radiofrequency ablation and corticosteroid-based **GNB**, finding both methods effective in reducing pain and improving joint function post-**TKA**. [PubMed.]