

Mini Review

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Regional Blocks in Orthopedic Intramedullary Nails Implant Removal: A Targeted Mini Review



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Abbreviations: GA: General Anesthesia; PFNA: Proximal Femoral Nail Anti-Rotation

Introduction

Cephalomedullary nail fixation is the gold standard for unstable intertrochanteric and subtrochanteric fractures, as well as Tibial Shaft Fractures. Implant removal, although not as common as insertion and fixation, as it is considered an elective procedure, but remains necessary and could be urgent in cases of pain, infection, or implant failure [1]. General anesthesia (GA) has been the go-to choice for intramedullary (IM) nail removals. With regional anesthesia techniques, such as spinal, epidural, or peripheral nerve blocks, offering potential superior benefits, including but not limited to avoidance of airway manipulation [2]. Nevertheless, Orthopedic surgeons are reluctant to adopt these methods during implant removal operations, mostly given the possible patient's intraoperative experiences, particularly the disturbing acoustic and tactile sensations associated with hammering, reaming, or the implant extraction itself.

The Use of Regional Blocks In CMN Removals

Multiple reports described the successful utilization of regional blocks in IM nail removals. One reported case illustrated a removal of a tibial nail under spinal anesthesia supplemented with a combined femoral-sciatic nerve block, achieving excellent perioperative analgesia with more than 30 hours of pain control [3]. Similarly, another report of a complex peri-implant femoral shaft fracture where removal of a stuck short proximal femur nail was performed under a combined approach of spinal and epidural anesthesia, followed by distal femur plating and bone grafting.

Highlighting safe implant removals in like scenarios [4]. Another technical note described removing proximal femoral nail anti-rotation (PFNA) when conventional unlocking failed. It involved drilling a cortical hole at the blade tip, all while utilizing spinal anesthesia, which underscored that neuraxial techniques alone can provide sufficient anesthesia for such surgeries without the need to convert to general anesthesia [5]. One Case reported the Use Of a combination of suprainguinal fascia iliaca compartment and sciatic nerve blocks both allowed for conducting an awake hip hemiarthroplasty following an intertrochanteric fracture [6].

Peripheral nerve blocks, including femoral, lateral femoral cutaneous, and sciatic blocks, have been utilized and exhibited sufficient anesthesia for high-risk patients undergoing intertrochanteric or tibial fixation/removal procedures. Such approaches are particularly valuable when neuraxial anesthesia is contraindicated (e.g., anticoagulation, spine disease, frailty) [7]. Advantages of Regional Anesthesia Techniques: Regional blocks have consistently shown an extended postoperative analgesia duration compared to GA or spinal with opioid use [3], as well as a reduced complication rate as the use of such blocks decrease the incidence of major adverse events such as hypotension, pulmonary complications, and postoperative course delirium [7]. These benefits are particularly significant for elderly individuals and patients with multiple comorbidities. Growing evidence exists that show that the use of Regional anesthetic techniques can help in early recovery, earlier return to mobilization, and a

decrease weaning of opioids [8]. Not to underestimate that such blocks can be performed even in those with contraindications to GA or neuraxial techniques, for various reasons without delaying surgery in cases of Urgent matter.

Surgeons' Opinion and Concern of Use

Despite the strong evidence, many orthopedic surgeons are still cautious about the use of regional anesthetic methods for implant removal. The major point of disagreement arises from the uncomfortable feeling to the patient due to intraoperative noise and hammering sensations. Completely different from fracture fixation procedures, where pain is dominant, removal procedures often involve loud sounds and vibrations that patients perceive as disturbing, even when that pain is completely controlled. Due to such circumstances, it eventually leads many surgeons to request GA for the comfort of the patient and procedural ease [9-11]. Furthermore, challenging scenarios like bent or broken nail removals may require extensive manipulation, reinforcing the preference for GA use.

Practical and Clinical Implications

Regional anesthesia is a safe, effective, and often superior option for Cephalomedullary nail implant removal. However, underutilization is mainly due to the surgeon's perception of patient psychological trauma, irritation, and emotions rather than anesthetic limitations. Some means to overcome this include, but are not exclusive to the importance of counseling strategies preoperatively, especially the expected noises in the operating room. The Other thing is utilizing the use of conscious sedation methods to induce amnesia and reduce awareness. [2,8].

Conclusion

Even though regional blocks provide an excellent anesthesia and analgesia for orthopedic IM nail removals, their wide adoption remains limited. The primary concern is not related to either efficacy nor safety, but the intraoperative disturbance in sensation, particularly the noise and hammering that patients find distressing. Orthopedic surgeons, therefore, frequently prefer and choose GA over other methods of anesthesia. Future work should foster the collaboration of surgeons and anesthesiologists

and surgeons to expand the use of regional anesthetics in cases of cephalomedullary nail implant removal.

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