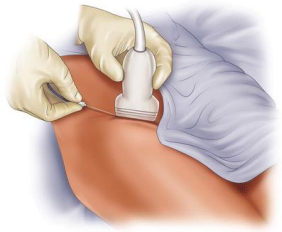
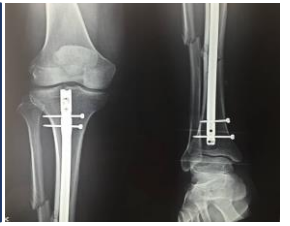


Peripheral Nerve Blocks in Intramedullary Nailing of Closed Tibial Shaft Fractures: Friend or Foe? A Systematic Review

Mr Sreekar Devarakonda, Mr Rohan Sadera, Mr Dhawal Patel

Mid Cheshire Hospitals NHS Foundation Trust, Crewe, United Kingdom



Background

- Compartment syndrome is a potentially limb-threatening complication in closed tibial shaft fractures managed with intramedullary nailing
- Peripheral nerve blocks are increasingly used for pain control, but there are concerns that they may mask or delay the compartment syndrome diagnosis
- The safety and efficacy of these blocks in this high-risk setting remain unclear

Aims and Methods

- A systematic review undertaken in accordance with PRISMA guidelines to evaluate the safety and analgesic efficacy of peripheral nerve blocks in closed tibial shaft fracture intramedullary nailing
- PubMed, Cochrane Library, and Google Scholar were searched up to 31-08-2025
- Eligible studies included closed tibial shaft fractures in adults managed with intramedullary nailing, reporting outcomes for peripheral nerve blocks, neuraxial anaesthesia (spinal/epidural), or general anaesthesia (GA)
- The **primary outcome** was incidence of compartment syndrome **Secondary outcomes** included pain scores and opioid requirements

Results

Three studies (n = 116 patients) met the inclusion criteria: one randomized controlled trial (RCT), one cohort study, and one case report.

• **RCT** - 48 patients (24 spinal, 24 GA), with **three cases of compartment syndrome in the GA group** and none in the spinal group

• **Cohort study** - 67 patients (33 peripheral nerve block alone, 34 GA), with **no cases of compartment syndrome** in either group

• **Case report** described **one compartment syndrome** following GA combined with a peripheral nerve block

The cohort study demonstrated **significantly reduced** intraoperative and postoperative **day 1 opioid use** in the nerve block group, while pain scores were similar across the RCT and cohort studies.

Conclusions

In patients with closed tibial shaft fractures undergoing intramedullary nailing, **peripheral nerve blocks appear to provide an opioid-sparing effect without clear evidence of increased risk of compartment syndrome.**

Current evidence remains limited and heterogeneous, highlighting the need for larger, prospective studies to confirm safety and guide clinical practice.