

Perioperative prolonged analgesia with four “single shot” peripheral nerve blocks for bilateral tibial reconstructive surgery: a feasible option?

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Introduction

The Nuffield Orthopaedic Centre is a tertiary referral centre for deformity corrections. Ilizarov frames - external circular fixators - are frequently used to lengthen or reshape the bones, with several such cases performed in our institution every week. Unilateral distal lower limb procedures are usually performed under combined peripheral nerve blocks and general anaesthesia, while for bilateral cases central neuraxial anaesthesia is considered our technique of choice.

Case

A 27 year old ASA 1 man weighing 67.5kg presented for bilateral Ilizarov frame application for limb deformity secondary to rickets (Fig 1-2). He was keen to avoid opiates due to PONV and refused central neuraxial blockade due to childhood meningitis. The operating surgeon (Fig. 3) was (and is) a great believer in the benefits of regional anaesthesia for Ilizarov and other reconstructive surgery.

Management and Outcome

Informed consent was obtained for bilateral ultrasound-guided “single-shot” femoral and sciatic (popliteal) nerve blocks following general anaesthesia, with routine monitoring.

75 mg of Ropivacaine, diluted to 20 ml volume with normal saline was used for each block. Therefore, the total dose of ropivacaine used in this patient was 300mg (4.4 mg/kg).

The operation, recovery and post-operative course were uneventful. He required no rescue morphine and no antiemetics. The patient reported excellent post-operative analgesia with the blocks lasting approximately 24 hours. He reiterated his positive experience 7 months later when the frames were removed.

Discussion

The maximum recommended dose of ropivacaine varies, with most countries suggesting a highest dose of 3-4mg/kg. In clinical practice, however, higher doses are frequently used. It has been suggested that local anaesthetic doses should be block-site specific and individualised according to age and disease-related influences on their pharmacodynamics and kinetics.

Schoenmakers et al demonstrated that in patients who received combined femoral/sciatic blocks with 60 ml of 0.75% ropivacaine, free serum concentrations of ropivacaine - both with and without epinephrine - remained well below the assumed threshold of 0.56 mcg/ml for systemic toxicity.

Conclusion

While central neuraxial blockade remains our technique of choice for bilateral lower limb surgery, the above case demonstrates that bilateral femoral and sciatic blocks can be a feasible option in appropriate cases.

References

1. Rosenberg PH, Veering BT, Urmey WF. Maximum recommended doses of local anesthetics: A Multifactorial Concept. *Regional Anaesthesia & Pain Medicine* 2004; 29:564-575
2. Schoenmakers KP, Vree TB, Jack NT, van den Bemt, van Limbeek J, Stienstra R. Pharmacokinetics of 450 mg ropivacaine with and without epinephrine for combined femoral and sciatic nerve block in lower extremity surgery. A pilot study. *British Journal of Pharmacology* 2013; 75: 1321-7



Fig. 1-2: X-rays demonstrating bilateral tibial verum deformity before and after correction with the Ilizarov frames.

Fig. 3: Operating surgeon Mr M McNally, also known as “Mr McNazarov”

