

# CASE REPORT: ULTRASOUND GUIDED PERIPHERAL NERVE BLOCKADE REDUCES HALOTHANE AND IMPROVES POST OPERATIVE ANALGESIA FOR PAEDIATRIC TRAUMA. A FIRST AT MARSABIT GENERAL HOSPITAL, KENYA.

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The Kenya Orthopaedic Project (KOP) is funded by our non-profit making charity (EGHO\*), which works collaboratively, mainly with Government-run institutions in Kenya. We aim to build local capacity to advance Orthopaedic services through sharing of knowledge and skills. Teaching and training, rehabilitation, follow up and audit of practice are all vital elements of KOP progression.

**We report our experience providing ultrasound guided peripheral nerve blockade to provide anaesthesia and post-operative analgesia for Paediatric Trauma Surgery at Marsabit General Hospital (MGH), Kenya.**

Marsabit District Hospital is an 86 bed hospital and typically, one third of its daily intake of patients present with trauma. Many patients will have come from rural communities with poor road links and since there is no government funded emergency service it may have taken them anything from hours to days to reach medical help.



## CASE:

A 12 year old girl, who was hit by a vehicle suffering a femoral fracture.

With our visiting trauma team working with the local theatre team, we were able to avoid the 550km journey to Nairobi and instead provide ORIF locally – a **Marsabit General Hospital first**.

- Consent was obtained using our local interpreter.
- Anaesthesia was induced with Propofol and Fentanyl
- Maintained with Halothane with the girl spontaneously breathing on an LMA.
- Using Ultrasound (Mindray provided by MGH) with an in-plane approach we provided Femoral, Anterior Obturator and Lateral Cutaneous Nerve blockade using 15 ml of 0.5% Levo-Bupivacaine + 1:400,000 Adrenaline, with 3.3mg intravenous Dexamethasone to maximise block duration.
- Post-operative analgesia: Paracetamol, Ibuprofen and Codeine

## RESULTS:

We delivered a quality anaesthetic using the local Mindray WATO EX -55 with a minimal dialed inspired concentration of Halothane between 0.5% and 0.7%. We use dialed concentration as there was no gas analysis available – we used 2-3x Minute Volume as our fresh gas flow to ensure minimal CO<sub>2</sub> rebreathing and therefore assumed our inspired concentration of volatile similar to the dialed.

She was comfortable immediately post op and at 24h post op. She was able to mobilise with physiotherapy support at 48 hours post op and made an excellent recovery.

## DISCUSSION:

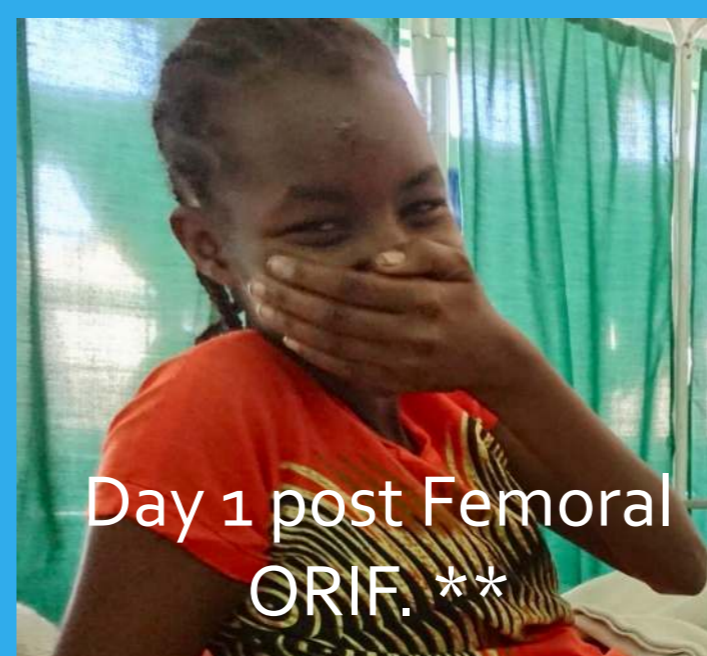
Although a range of induction agents are available the common anaesthetic agent used for maintenance of anaesthesia at MGH for minor trauma would be Halothane in 100% Oxygen using either intermittent facemask ventilation or a reusable LMA.

With no gas analysis available dialed concentrations of Halothane used are typically between 1-2%. Spontaneous ventilation is preferred and so use of opiates such as fentanyl is usually limited. Paracetamol and Ibuprofen provide the mainstay of post-operative analgesia although Morphine is available.



Complications from Halothane are well documented. Relatively high inspired concentrations of Halothane, lack of gas analysis, limited analgesic options and potentially low minute volume with subsequent raised PaCO<sub>2</sub>, increase the risk of cardiac arrhythmia, hepatitis and post operative pain.

Regional anaesthesia is generally accepted as an integral component of postoperative pain relief in paediatric patients, (1) and are regarded as safe (2)



With effective regional anaesthesia we were able to significantly reduce delivered concentrations of Halothane and provide excellent post operative analgesia.

## CONCLUSION:

Use of ultrasound guided regional anaesthesia can be used safely and effectively in paediatric surgery in resource poor sites such as at Marsabit General Hospital. Benefits suggested by this case include improved surgical conditions, reduced Inspired volatile concentration, improved post operative analgesia, and early mobilization.



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**With Thanks...** Whilst in Marsabit, the KOP team were privileged to work with local Anaesthetist, Dr Tumanka Kamaro. We are grateful to him for sharing his specialist knowledge with us and for being so enthusiastic and keen to learn new Regional techniques. The team look forward to re-visiting the hospital in the near future and working with him again to develop the regional anaesthetic provision at Marsabit General Hospital.



## References:

1. Johr M. Practical pediatric regional anesthesia, *Curr Opin Anaesth*, 2013, vol. 26 (pg. 327-32)
2. Giaufre E, Dalens B, Gombert A. Epidemiology and morbidity of regional anesthesia in children: a one-year prospective survey of the French-Language Society of Pediatric Anesthesiologists, *Anesth Analg*, 1996, vol. 83 (pg. 904-12)