

Ultrasound Guided Regional Anesthesia for Hip Fractures in the Emergency Department

An interdepartmental consensus statement has been generated and approved by Emergency Medicine, Orthopedic Surgery, Trauma Surgery, and Anesthesia Teams as part of a comprehensive hip fracture pathway to improve care for older patients with hip fractures. High quality care of these patients starts with early, adequate pain control.

Hip and proximal femur fractures are a common diagnosis among trauma and elderly patients¹. There is significant morbidity and mortality related to these injuries, especially among our geriatric population. Pain control options in the elderly population are limited by negative side effects, including delirium². Insufficiently controlled pain has also been associated with increasing rates of delirium amongst hip fracture patients³. Pain management through regional anesthesia has been shown to improve patient comfort^{4,5} and satisfaction, reduce complications associated with intravenous analgesia², and improve mobility and post-operative course⁵, and is recommended for preoperative pain control⁶. Ultrasound guidance improves block safety and efficacy^{7,8}.

Purpose:

- To provide prompt and adequate pain control for patients with hip fractures
- To reduce the use and, therefore, complications associated with parenteral narcotics
- To improve post-operative healing
- To improve patient satisfaction

Inclusion:

- Patients 55 years of age or older who present to the Emergency Department (ED) and are diagnosed with a hip fracture

Exclusion criteria:

- Patient refusal
- Known allergy to local anesthetic
- Infection at the overlying site of planned injection
- Pre-existing mononeuropathy or neuromuscular disease affecting the extremity to be blocked
- Traumatic neurologic deficit in the extremity to be blocked
- Fracture pattern considered at considerable risk for compartment syndrome, as deemed by the treatment team (ex. Concomitant tibia fractures in the same extremity)

Process

- Following identification of a patient who meets criteria for FICB, the ED physician team will consult the Orthopedic Resident. The Orthopedic Resident shall evaluate the patient in a timely manner and verify appropriateness of FICB with the ED team.
- **If the ED physician team can perform the block**, consent shall be obtained, and the block shall be performed expeditiously in accordance with ED accepted guidelines. Ultrasound faculty working in other pods will be available to assist if the TCC attending is unable to supervise the block.
- **If the ED physician team does not have the capacity to perform the block**, Anesthesia shall be consulted by contacting the Trauma Anesthesia Lead/Regional Anesthesia at 314-749-6200. They will work to arrange transport to the PACU for Anesthesia performed block. Unless an inpatient bed is immediately available, the patient will return to the ED. Ideally, this process occurs within 3 hours of consultation.

Procedure

Procedural supplies:

- Equipment found in the ED Regional Anesthesia/Nerve Block (blue) cart located in EM1:
 - Echogenic blunt tip nerve block needle (ULTRAPLEX Echogenic needle; 4" 20G and 2" 22G)
 - 30mL syringe(s)
 - Chloral prep
 - Sterile probe cover
 - Sterile gloves
 - Tegaderm
- Additional supplies:
 - 10mL NS Flushes
 - Local anesthetic to be obtained by RN from Pyxis
- Rescue equipment and medication will be immediately available – including airway supplies and medications, as well as Intralipid in Pyxis (order placed as lipid bolus and infusion in Epic if administration is required)

Procedure performance:

****note:** this brief procedure description is not meant to cover every detail needed to perform a safe and successful block. Training material and tutorials are separate from this policy

- Perform a focused neurologic assessment and documented in chart to include assessment of motor function and sensory of the affected leg.
- Calculate weight-based dose of local anesthetic. Use color coded chart on cart or Safe Local app for assistance. Dilute local anesthetic with normal saline to reach desired volume, typically 30-50 mL.
- Attach the patient to cardio-respiratory monitoring which should be maintained throughout the procedure. Monitoring with RN present shall continue for 30 minutes following the procedure.
- Sterile technique, including mask and sterile gloves, sterile preparation of the patient's inguinal region, and a sterile US probed cover should be used.
- Scan to identify anatomy of interest, including US localization of the femoral vein, femoral artery, and femoral nerve as well as the fascia iliaca, which is identified just above the femoral nerve and iliopsoas muscle. Trace the fascia iliac laterally where it becomes more superficial and distant from structures of concern (vasculature, nerve bundles).
- The needle should be inserted through the skin and tracked using an in-plane technique while advancing medially towards the target plane, just deep to the fascia iliaca.
- Continuous visualization of the needle and the fascia iliaca should be maintained until the needle has pierced the fascia iliaca.
- Aspirate to ensure the needle is not intravascular.
- An assistant should slowly inject 2-5cc of local anesthetic under ultrasound guidance to demonstrate hydro-dissection of the fascial plane.
- Once appropriate positioning is confirmed, 5mL aliquots of local anesthetic are injected under direct US visualization, withdrawing after each aliquot, to ensure injection is not intravascular and has not migrated out of the fascial plane, until entire volume has been administered.
- A bandage is placed over the injection site.
- **The procedure must be documented in the patient's chart, using Procedure Note: Nerve Block and representative images must be stored and documented in QPath.**

References:

1. Riddell, M; Ospina, M; Holroyd-Leduc, J. "Use of Femoral Nerve Blocks to Manage Hip Fracture Pain among Older Adults in the Emergency Department: A Systematic Review". *CJEM* 2016; 18(4): 245-252
2. Clinical Practice Guideline: "The Management of Chronic Pain in Older Persons: American Geriatric Society Panel on Chronic Pain in Older Persons". 1998.
3. Morrison, RS et al. "Relationship between pain and opioid analgesics on the development of delirium following hip fracture." *J Gerontol A Biol Sci Med Sci.* 2003; 58:76–81.
4. Beaudoin, F; Nagdev, A; Merchant, R; Becker, B. "Ultrasound-guided Femoral Nerve Blocks in Elderly Patients with Hip Fractures". *American Journal of Emergency Medicine* 2010;28: 76-81.
5. Saunders, KW et al. Relationship of opioid use and dosage levels to fractures in older chronic pain patients. *J Gen Intern Med.* 2010;25(4):310-315.
6. Roberts, K et al. "AAOS Clinical Practice Guideline Summary: Management of Hip Fractures in the Elderly." *Journal of the American Academy of Orthopedic Surgeons.* 2015; 23(2):131-137
7. Dolan, J et al. "Ultra- sound guided fascia iliaca block: a comparison with the loss of resistance technique." *Regional Anesthesia and Pain Management.* 2008; 33: 526-31.
8. Barrington, MJ; Kluger, R. "Ultrasound guidance reduces the risk of local anesthetic systemic toxicity following peripheral nerve blockade." *Regional Anesthesia and Pain Medicine.* 2013; 38: 289–99.