



A Century old neuraxial technique for a Centenarian presenting with a hip fracture

Juan C. Acosta, MD; Linda Le-Wendling, MD; Federico Jimenez-Ruiz, MD.

Department of Anesthesiology, University of Florida College of Medicine, Gainesville



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Introduction

Epidural anesthesia is a century-old neuraxial technique used for surgical anesthesia and analgesia across various surgical cases. This technique proves particularly beneficial in frail patients with severe co-morbidities, where both general and spinal anesthesia may not be the best options. We present the case of a 101-year-old female with severe pulmonary hypertension and mild aortic stenosis who underwent hip fracture repair with epidural anesthesia as her primary anesthetic.

Case

- 101-year-old female with a right intertrochanteric femur fracture presenting for ORIF and IM nail.
- Medical history:**
 - Severe pulmonary hypertension (RVSP 68mmHg)
 - Mild aortic stenosis, hypertension, CKD, T2DM, hyperlipidemia, anemia, GERD.
- Preoperative evaluation:**
 - BMI 22.9 kg/m2
 - AOx3, no acute distress. Supine, RLE adducted and externally rotated.
 - EKG: NSR
 - TTE: EF 60-65%
 - Hb: 7.8 g/dl, Plt: 228k/uL
 - HbA1c: 7.7%
 - Creatinine: 1.81 mg/dl
 - Vital signs within normal limits.

Management

Pre-op	Intra-op	Post-op
- Infra inguinal fascia iliaca block due to pain/positioning for epidural. - L2-3 epidural. - Dose: 75 mcg fentanyl + 8ml 0.75% ropivacaine in divided doses. - Sedation, apnea and hypotension. - IV naloxone, bag mask ventilation, vasopressin bolus. - 1u pRBCs.	- 1u pRBCs, 1.7L crystalloid. - 6mcg dexmedetomidine. - 25mcg epidural fentanyl. - insulin infusion. - 1u vasopressin. EBL: 150ml Urine: 400ml	- Epidural infusion of 0.2% ropivacaine at 2ml/hr. - Epidural removed on POD 1. - Mild AKI, UTI. - 5 day antibiotic course. - Discharged to rehabilitation facility on POD 9.

Table 1. Perioperative management.

Technique	Advantages	Disadvantages
General Anesthesia	- optimal surgical conditions with muscle relaxants. - stablished airway if intraoperative complications occur. - allows for better monitoring with capnography.	- affects cardiac function. - can affect cognitive function. - systemic vasodilatory effect. - positive pressure ventilation may increase bleeding.
Epidural	- gradual onset, titratable. - provides post-operative analgesia.	- urinary retention. - potential for neuraxial hematoma.
Single injection spinal	- provides a dense block. - allows for spontaneous ventilation.	- potential for significant hemodynamic shifts including bradycardia/asystole from high spinal. - dry taps can occur. - potential difficult placement. - difficult to determine dose.
Continuous spinal	- titratable, can prolong block. - can fail if catheter tip results in maldistribution of local anesthetic.	- higher risk of post dural puncture headache. - dry tap. - potential for dense block with significant hemodynamic shifts. - potential for neuraxial hematoma.

Table 2. Comparison of anesthetic techniques for hip fracture surgery.

Discussion

- Technique first described by Fidel Pagés Miravé in 1921.
- Increasing frequency of orthopedic procedures in elderly patients who are frail and may have multiple severe co-morbidities.
- Elderly patients are challenging due to poor physiologic reserve, cognitive decline and altered drug metabolism.
- Epidural technique may be suitable for surgical anesthesia and postoperative analgesia.
- Caution required in dosing due to potential hemodynamic instability, sedation, and respiratory depression.
- Divided dosing of local anesthetic allows for slower onset and adequate time to manage hemodynamic changes.
- Requires a cooperative patient.
- Opioids can help reduce local anesthetic requirement but may have important systemic effects.
- 6-8ml of 0.75% ropivacaine can usually provide adequate relaxation and surgical anesthesia.
- Careful consideration of anesthetic technique advantages/disadvantages is important for elderly, frail patients undergoing hip fracture repair.

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