

THROUGH-KNEE AMPUTATION UNDER PERIPHERAL REGIONAL ANESTHESIA WITHOUT SEDATION

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Introduction

- Patients presenting for urgent amputation for vascular disease often carry comorbidities complicating the use of general or neuraxial anesthesia.
- Regional anesthesia may reduce risk of pulmonary complications, arrhythmias,¹⁻² and transfusions.³ Peripheral nerve blocks allow for intraoperative hemodynamic stability by avoiding sympathetic blockade, and they provide postoperative pain control.⁴⁻⁵
- We report on the use of sciatic, femoral, lateral femoral cutaneous, and obturator nerve blocks for a through-knee amputation without intravenous sedation in a frail patient.

Case Description

- 56 yo F with PMHx of homelessness, T2DM, HTN, COPD, obesity, and bilateral iliac stents
- Four weeks of right foot pain, numbness, and weakness up to her mid-calf necessitating through-knee amputation for acute limb ischemia
- **Emphysema** on PFTs, **severe pulmonary HTN** on TTE.
- ICU admission for BIPAP due to **hypercapnic respiratory acidosis** and **obtundation**.
- Diuresed and weaned to HFNC by morning of amputation, though still **drowsy on exam**. Recheck of **INR was 1.5**.
- Ultrasound-guided peripheral nerve blocks with minimal to no sedation planned as primary anesthetic.

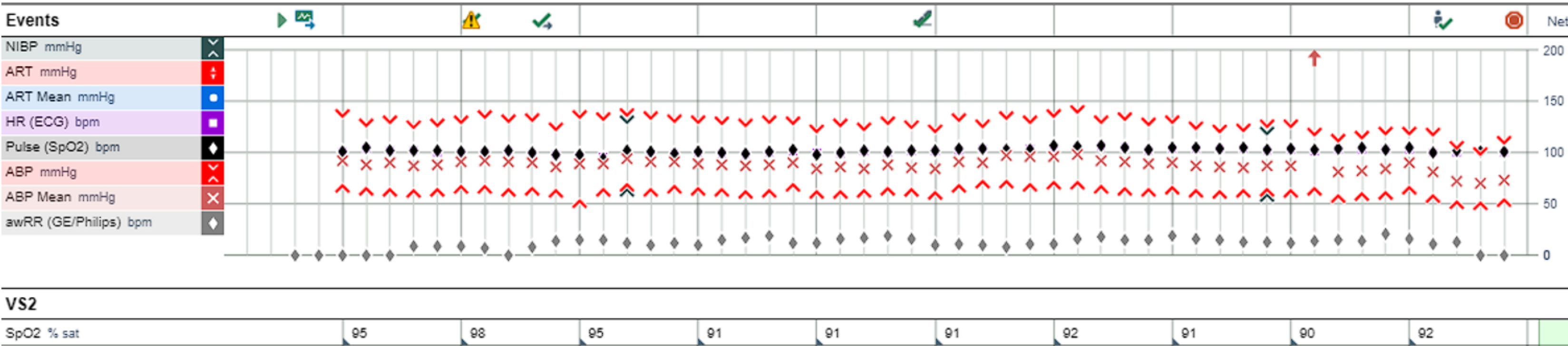


Figure 1. Intra-operative anesthetic record during through-knee amputation.

Anesthetic

Pre-op nerve blocks in ICU prior to OR transfer:

- Bupivacaine 0.375% + epinephrine 2.5 mcg/mL (50 mL total)
- Nerve blocks:
 - **Subgluteal sciatic** (20 mL) + PNC
 - **Femoral** (15 mL)
 - We did not place a PNC due to bilateral groin fold fungal infections
 - **Lateral femoral cutaneous** (5 mL)
 - **Obturator** (5 mL each for the anterior and posterior branches)

Intra-operatively:

The patient was placed on CPAP, and the surgeons tested the block by pinching the skin around her knee using tissue forceps. The patient received **no IV medications** from the in-room anesthetist, but the surgeons infiltrated **bupivacaine 0.25% 10 mL subcutaneously** (half after incision and exposure of subcutaneous tissue, and the other half after joint exposure) as she complained of **pain in the lateral aspect of the knee and posteriorly**. The surgeons **did not use a tourniquet**. Hemodynamics and respiration were stable throughout the case (Fig.1). When evaluated after returning to the ICU, she reported zero pain.



Figure 2. Image of patient's knee during dressing change in the days following her through-knee amputation.

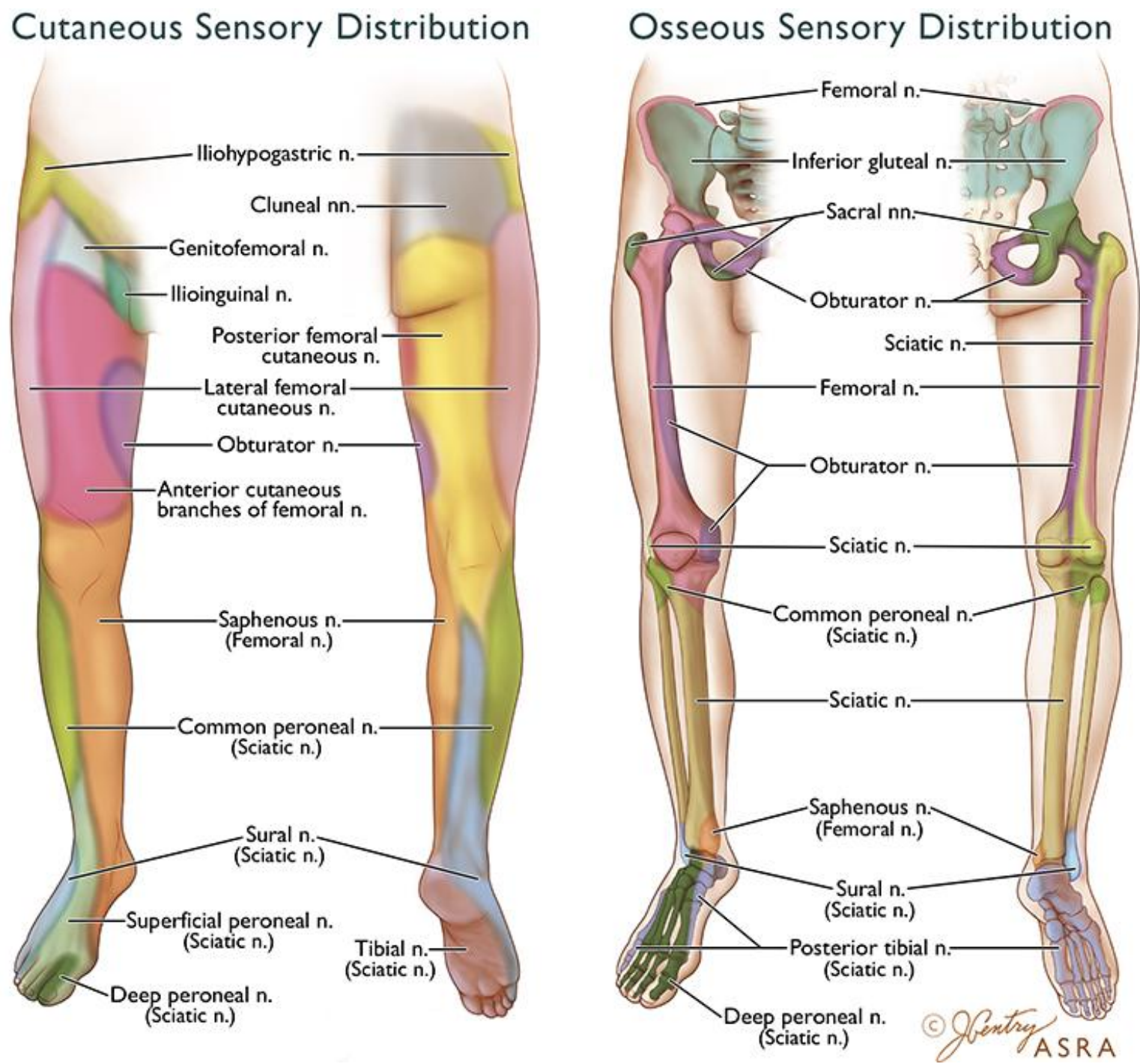


Figure 3. Cutaneous and osseous sensory distribution of the leg.⁶

Discussion

Choice of Local Anesthetic:

We used bupivacaine 0.375% (rather than 0.25% or 0.5%) to increase the volume available to ensure adequate spread while keeping the block dense. Her IBW of 57 kg allowed 45.6 mL (171 mg) with maximum dose being 3 mg/kg. As her ABW was 95 kg, we were comfortable increasing the total volume to 50 mL. Additional LA was needed intraoperatively for better coverage at the posterior and lateral aspect of her knee, which may have been due to **inadequate blockade of her posterior femoral cutaneous nerve**. As this was given SQ, and the total dosage of bupivacaine (192.5 mg) was still well below what her ABW would allow (285 mg), we felt her risk of toxicity was low.

Sedation:

Our patient was already drowsy, likely due to hypercapnic respiratory acidosis and metabolic encephalopathy, so she did not require IV sedation to remain still and calm for the blocks or intraoperatively, but **patients who are more alert may benefit from sedation for comfort**.

The use of sciatic, femoral, lateral femoral cutaneous, and obturator nerve blocks served as surgical anesthesia for a through-knee amputation in this ASA IV patient with respiratory failure. Peripheral nerve blocks allowed the anesthesia team to **avoid mechanical ventilation** and **provided hemodynamic stability**. Her sciatic PNC also provided analgesia after surgery to lessen her use of opioids which could cause respiratory depression (Fig. 2). This case supports the use of peripheral nerve blocks as the sole anesthetic for lower limb amputation in sick patients.

References

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