Surgical anesthesia for revision total hip arthroplasty with quadratus lumborum and fascia iliaca block

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ABSTRACT

We present a case in which surgical anesthesia was provided for revision of earlier total hip arthroplasty with quadratus lumborum and fascia iliaca blocks. We believe that this case is the first to be reported using this technique for this procedure. Our patient was a high-risk candidate for general and neuraxial anesthesia because of significant cardiac dysfunction and therapeutic anticoagulation.

KEYWORDS Fascia iliaca; quadratus lumborum; regional anesthesia; revision total hip arthroplasty; surgical block; total hip arthroplasty

Patient frailty imposes a need for creativity among anesthesiologists caring for patients with complex medical comorbidities. It is important to have alternative methods of providing anesthesia than general anesthesia and neuraxial anesthesia, because a greater number of patients will have contraindications to both. Surgical anesthesia utilizing regional anesthesia is an ideal method if the necessary dermatomes and osteotomes are covered. Recent articles have demonstrated successful anesthesia for hip surgery using fascia iliaca block; deep sedation and analgesia with narcotics or infiltration of local anesthetic have also been required.^{1,2}

CASE REPORT

An 84-year-old woman with a body mass index of 26 kg/m² presented for a revision left total hip arthroplasty for recurrent dislocations. She previously had had coronary artery bypass grafting, hypertension, hyperlipidemia, and atrial fibrillation. She underwent bedside closed reductions of the hip implant, but the artificial joint repetitively dislocated following these attempts.

She had monthly anginal episodes requiring nitroglycerin, the last of which occurred the week prior to admission. On echocardiogram, the left ventricular ejection fraction was 35% with global left ventricular hypokinesis, restrictive left ventricular diastolic filling, reduced global right ventricular systolic function, mild aortic regurgitation, moderate tricuspid regurgitation, and right ventricular systolic pressure of 27 mm Hg with trace pulmonic regurgitation. Cardiology

deemed her high risk in terms of cardiac complications following general anesthesia, noting that only her left internal mammary artery provided myocardial perfusion. The patient was on chronic warfarin therapy for atrial fibrillation. She was a poor candidate for neuraxial anesthesia due to a supra-therapeutic international normalized ratio of 1.44 as well as for general anesthesia due to her significant cardiac risk factors. The decision was made to perform the surgery under a surgical regional anesthetic technique, utilizing a quadratus lumborum (QL) type 1 block and a fascia iliaca (FI) block.

The blocks were performed under ultrasound guidance with the patient in the supine position in the preoperative holding area. A high-frequency linear ultrasound transducer and a 21-gauge blunt-tipped echogenic needle were used for both blocks. The FI block was performed as described by Hebbard et al.³ Using the ultrasound transducer in a parasagittal plane, the anterior superior iliac spine was identified. The ultrasound probe was translated medially until the “bowtie” of the FI appeared over the iliacus muscle, bound cranially by the internal oblique muscle and caudally by the sartorius muscle. Following skin sterilization, the needle was advanced in plane in a caudal-to-cranial direction until normal saline was seen to spread underneath the FI over the iliacus muscle, and 20 mL of 0.5% bupivacaine hydrochloride was deposited in this location. We then performed the QL type 1 block as described by Blanco and McDonnell.⁴ The ultrasound probe was placed between the iliac crest and the lower costal margin in a transverse orientation, and the external oblique, internal oblique, and transverse abdominis were

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Figure 1. Surgical incision for revision left total hip arthroplasty. ASIS indicates anterior superior iliac spine.

identified. The probe was translated posteriorly and laterally until the transverse abdominis muscle terminated superficial to the QL muscle. The skin was sterilized. The needle was advanced in plane from anterior to posterior until the tip was positioned between the QL and internal oblique, medial to the termination of the transverse abdominis, and 20 mL of 0.5% bupivacaine hydrochloride was injected.

On arrival to the operating room, adequate sensory loss over the anterior thigh, lateral thigh, and left flank was tested and confirmed using an 18-gauge blunt tip needle. The patient was connected to monitors, and infusions of dexmedetomidine at 0.4 µg/kg/h and propofol at 10 µg/kg/min were initiated for intraoperative comfort. She did not require any narcotics or other analgesics during the procedure. The surgeons performed a revision left total hip arthroplasty with replacement of constrained joint liner, left hip trochanteric osteotomy, and extensive synovectomy with removal of impinging tissue and bone (Figure 1). The patient was then transferred to the postanesthesia care unit, where she remained pain free.

She required no pain medication for 16 hours after the blocks were placed. The first oral acetaminophen-hydrocodone 325 mg–5 mg tablet was given on postoperative day 1, and she received one additional tablet each hospital day. No other analgesic medication was required. She remained in the hospital for warfarin titration and was discharged 4 days after surgery once her international normalized ratio was in the therapeutic range for atrial fibrillation. She had no postoperative surgical or anesthetic complications.

DISCUSSION

Surgical blocks have been described as the primary anesthetic for fragility hip fracture.¹ FI blocks have been used in the past to provide analgesia after hip fracture surgeries and hip arthroplasties.^{5,6} Ruzbarsky et al performed FI block for cephalomedullary nails, but the surgeon needed to infiltrate with extra local anesthesia for the insertion point.¹ Due to the need for extra local anesthesia in this anesthetic

technique, we decided to perform our FI block in the suprainguinal region to more reliably cover the lateral femoral cutaneous nerve in addition to the femoral nerve.⁷ Johnston et al reported performing femoral nerve plus lateral femoral cutaneous nerve blocks in addition to sedation with propofol and alfentanil for either dynamic hip screws or hip hemiarthroplasties.² They had a failure rate of 7.2% with this technique, requiring conversion to general anesthesia.⁸

QL blocks have been used for analgesia after total hip replacement; thus, we added the QL block to allow us to perform the case without additional local anesthetic infiltration or narcotics.^{8–10} Additionally, a revision of a total hip replacement is more invasive than a cephalomedullary nail, dynamic hip screw, or hemiarthroplasty, justifying the addition of the QL block to the FI block.²

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