

Opioid-Sparing Fascia Iliaca Block in Advanced Duchenne Muscular Dystrophy: Navigating Distorted Anatomy in a High-Risk Patient

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Background:

- Duchenne Muscular Dystrophy (DMD): X-linked dystrophinopathy
- Disease progression leads to severe muscle weakness, restrictive lung disease, and OSA
- High risk for perioperative complications

Case History:

- 20-year-old male, 59.8 kg
- Presenting for conversion left total hip arthroplasty
- PMH: DMD, OSA (on nocturnal BiPAP), TBI, adrenal insufficiency, insulin resistance, and autism
- LVEF 55%, on lisinopril
- Persistently declining FVC (43%) and FEV1 (43%) consistent with severe restrictive defect

Anesthetic Considerations:

- Succinylcholine and volatile anesthetics can induce rhabdomyolysis and hyperkalemia
- Difficult airway
- Declining respiratory status in addition to OSA is associated with higher risk for perioperative respiratory complications
- DMD includes progressive fatty replacement of muscle which can distort normal anatomy

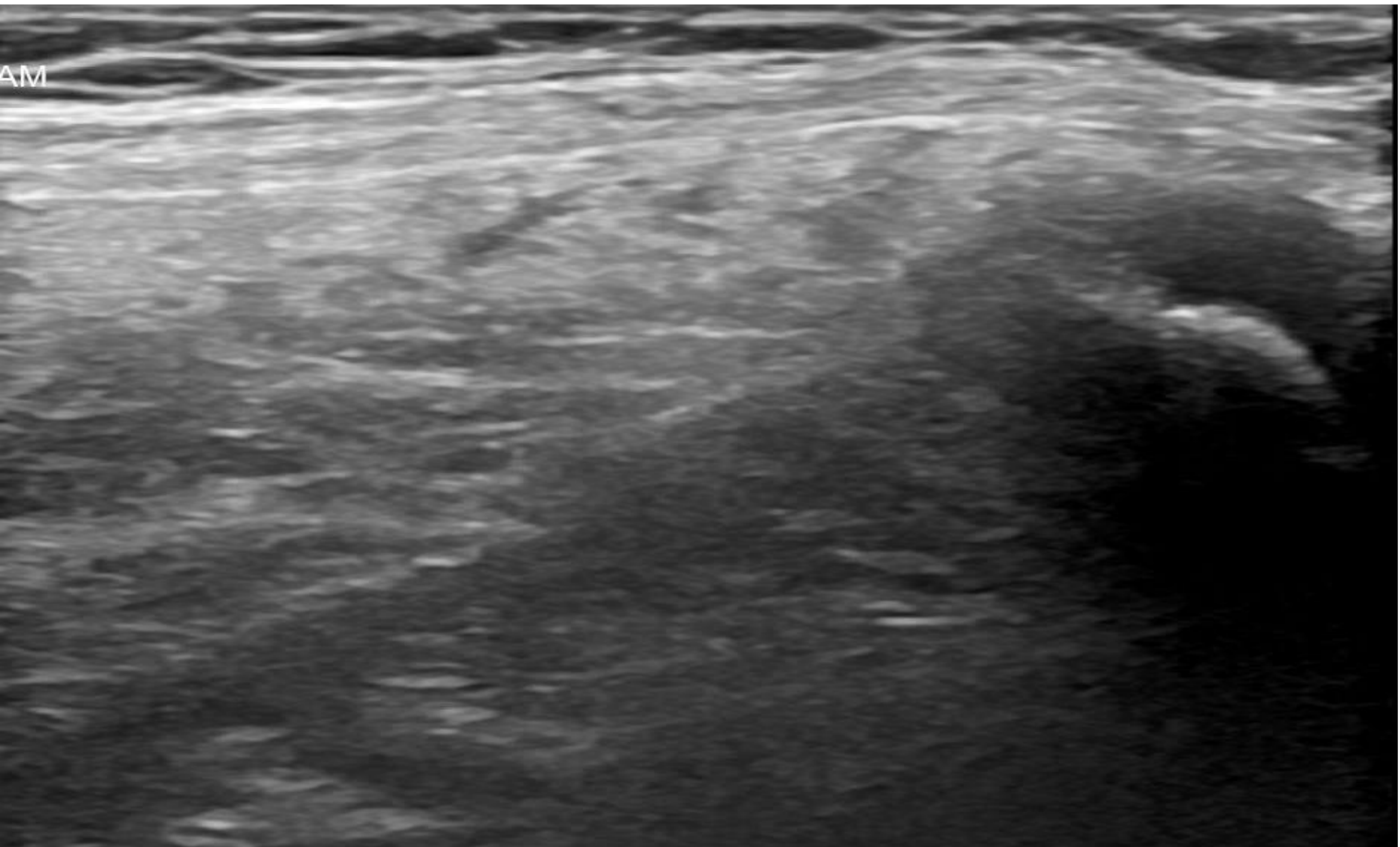


Figure 1: Intraoperative fascia iliaca block

Intraoperative Management:

- General anesthesia with ETT, malignant hyperthermia precautions in place
- Maintenance with TIVA
- Intraoperative fascia iliaca block
 - 0.2% ropivacaine 30 mL (60 mg)
 - Additives: dexmedetomidine 60 mcg
 - US identification of fascial plane noted to be difficult due to fatty muscle infiltration
- Multimodal pain regimen:
 - Preoperative Lyrica (75 mg)
 - Ketamine bolus (70 mg) and infusion (10 mcg/kg/hr)
 - Acetaminophen (15 mg/kg)
 - Low dose of methadone (2.5 mg)
 - Dexmedetomidine infusion (0.5 mcg/kg/hr)
- No additional opioids required intraoperatively

References:

Bang SU et al. Peripheral nerve blocks as the sole anesthetic technique in severe Duchenne muscular dystrophy. J Anesth. 2016;30(2):320-323.
Flanigan KM. Duchenne and Becker muscular dystrophies. Neurol Clin. 2014;32(3):671-688.
Hoang T, Dowdy RAE. A review of muscular dystrophies. Anesth Prog. 2024;71(1):44-52.
Kim HK et al. Fatty infiltration and inflammation in DMD on MRI. Pediatr Radiol. 2013;43(10):1327-1335.
Shiklyar I et al. Quantitative muscle ultrasound in Duchenne muscular dystrophy. Muscle Nerve. 2015;51(2):207-213.

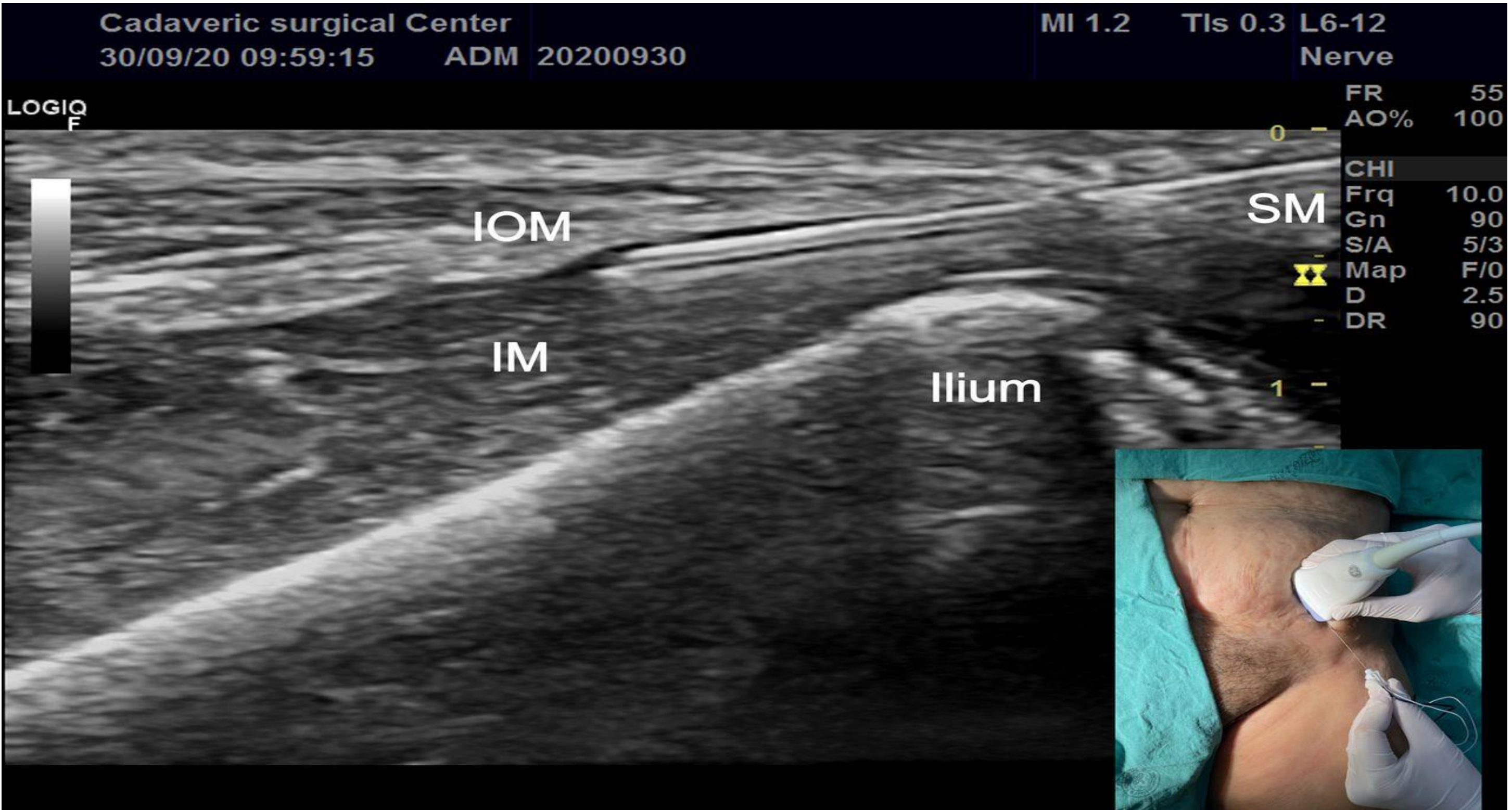


Figure 2: Normal anatomy of fascia iliaca block

Post Procedure Course:

- Patient extubated to BiPAP (per pulmonary recommendations), quickly weaned to RA
- Did not require any escalation in respiratory support
- Postoperative pain regimen:
 - Scheduled: Acetaminophen, Valium, Toradol, Robaxin, Lyrica x 2 doses
 - Scheduled dose of methadone (5 mg)
 - PRN: dilaudid (required 1 dose of 0.5 mg), transitioned to oxycodone on POD1
- No regional anesthesia complications were noted
- Discharged on POD1

Discussion/Conclusions:

- Regional anesthesia is effective and opioid-sparing in patients with DMD, especially in the presence of severe cardiopulmonary comorbidity
- However, regional anesthesia can be difficult due to fatty muscle replacement leading to distortion of normal anatomy
- Emphasizes the importance of anesthesiologist familiarity with altered anatomy associated with DMD