Images in Anesthesiology

Quadratus lumborum block intramuscular approach for pediatric surgery

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1. Introduction

Quadratus lumborum block is an abdominal truncal block for analgesia after abdominal surgery. There are some reports and controlled studies1,2 on ultrasound-guided quadratus lumborum block. We describe our own technique, in particular for pediatric cases.

2. Case Report

Oral informed consent was obtained from the parents of the patient for publication of this case report and accompanying image.

An otherwise healthy 7-year-old girl, weighing 21 kg, was diagnosed with acute appendicitis. Laparoscopic appendicectomy under general anesthesia with bilateral quadratus lumborum block was planned. Epidural block was not performed due to the abnormal value of prothrombin time.

After entering the operating room, the standard monitors were attached to the patient. General anesthesia was induced with thiamylal and the patient was intubated after muscle relaxation was gained with rocuronium. Anesthesia was maintained with sevoflurane.

The patient was placed in the supine position for quadratus lumborum block. The high-frequency linear probe was placed on the lateral abdomen, slightly cephalad to the iliac crest. Once the quadratus lumborum muscle was observed, the probe was tilted slightly to the caudal direction, to show the largest slice of the quadratus lumborum muscle. A 22-G block needle (Stimuplex D, B-Braun, Hongo, Bunkyo-ku, Tokyo) was inserted in-plane, ~1 cm ventral to the probe. The needle tip advanced until it penetrated the fascia of the quadratus lumborum muscle. A small amount of saline was injected to confirm the correct position of the tip, then 12 mL of 0.2 % ropivacaine was injected. The block was bilaterally performed, and 48 mg of ropivacaine (2.3 mg/kg) was injected (Appendix 1).

Supplementary video related to this article can be found at http://dx.doi.org/10.1016/j.aat.2016.10.003.

The surgery was performed with a 10-mm umbilical port and two 5-mm lateral ports on the left. The surgery finished without trouble. Fentanyl (50 µg) and acetaminophen (300 mg) were intraoperatively administered for visceral pain.

The patient had no pain after the procedure. Additional acetaminophen was administered 5 hours after surgery upon request of the patient. She slept well, and another dose of acetaminophen was administered 8 hours after the previous administration. The patient and her mother were satisfied with the perioperative analgesia.

There was no apparent complication concerning anesthesia.

3. Discussion

Quadratus lumborum block is effective for postoperative pain after abdominal surgery in adults1-3 and children.4 A relatively large amount of local anesthetic is required to perform truncal blocks—in this case 24 mL of 0.2 % ropivacaine (48 mg; 2.3 mg/kg) was injected. Although a large amount of local anesthetic can cause local anesthetic systemic toxicity, the pharmacokinetics of ropivacaine after quadratus lumborum block is safer than other truncal blocks1 and no complications or symptoms suspecting local anesthetic systemic toxicity were observed in this case.

There are several approaches5 regarding ultrasound-guided quadratus lumborum block: type 1, type 2, transmuscular, and intramuscular. However, injection into the interfascial plane might...
be difficult to reproduce.\textsuperscript{6} The intramuscular approach is easy to perform because the point of injection is inside the fascia of the quadratus lumborum muscle, similar to the fascia iliaca plane block. The local anesthetic should spread between the fascia and the muscle for a successful block. The positive endpoint can be easily observed sonographically.

The mechanism of action regarding intramuscular quadratus lumborum block remains unclear. In our preliminary cadaveric study with color dye injection, there were some cases with a small amount of leakage into the space between the middle layer of the thoracolumbar fascia and the fascia of the quadratus lumborum muscle. If this happens in clinical cases, the local anesthetic can reach the transversalis fascia toward the paravertebral space. Further study is warranted to elucidate the mechanism responsible for the analgesic effect of the intramuscular approach. The intramuscular approach seems a promising approach and should be compared with other approaches of quadratus lumborum block in the future regarding safety, feasibility, efficacy, and adverse effects.

**Conflicts of interest**

None.

**References**