Motor-sparing continuous median nerve block for hand surgery: A pediatric case

Takeshi Murouchi*

Department of Anesthesia, Kitami Red Cross Hospital, Kitami, 090-0026, Japan

Abstract

Here is described a successful perioperative pain control with continuous median nerve block after flexor tendon repair surgery on 2nd finger of a child. A 9-year-old patient was admitted for reconstruction surgery. The combination of median nerve block and lateral/medial antebrachial cutaneous nerve blocks were performed before the surgery to cover all the surgical incision including the 2nd finger, palm, the graft site proximal to the wrist, and Kleinert traction at the nail bed. At the end of the surgery, the infusion catheter was inserted at the distal one-third to spare the muscle strength of flexor digitorum muscles. Continuous bupivacaine infusion provided complete analgesia until the postoperative day 4 without interfering the postoperative physiotherapy. The continuous median nerve block at the distal one-third of the forearm spared flexion, and supported effective postoperative early mobilization after zone 2 flexor tendon repair surgery.

1. Introduction

Postoperative analgesia after flexor tendon repair of the finger is essential for a successful outcome to support effective early physiotherapy. Here is described a successful perioperative management of a flexor tendon repair surgery for a pediatric patient with continuous median nerve block.

1.1. Case report

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

An otherwise healthy 9-year-old male (130 cm/27 kg) presented to our hospital with a blunt injury in his right 2nd finger. The flexor tendon was severed at the zone 2 and was sutured in the emergency surgery. However, one month later he was diagnosed with the tendon tear. The reconstruction was planned four months after the initial injury.

Anesthesia was induced and maintained with sevoflurane. The airway was secured with a laryngeal mask, then median nerve block was performed at the distal one-third in the forearm, and lateral and medial antebrachial cutaneous nerve blocks were performed at the proximal arm. One mL of 0.5% ropivacaine was administered for each.

Surgery was performed without any hemodynamic changes. The nail was pierced with string for Kleinert traction at the end of the operation.

The catheter placement of continuous median nerve block was performed after the surgery (video 1). The skin was disinfected and sterilely draped, and a 5–10 MHz ultrasound probe was placed on the distal one-third of the forearm. An 18-gauge Tuohy needle was inserted in out-of-plane, with the bevel up. The infusion catheter was advanced 2 cm through the needle after hydrodissection with saline around the median nerve. The catheter tip was confirmed after injecting saline mixed with air. Cyanoacrylate glue was applied at the point of catheter insertion, and the catheter and surrounding skin were covered with a transparent film. Continuous infusion of 2 mL/h of 0.25% bupivacaine was initiated after emergence until the morning of postoperative day 4. There was no additional analgesia.

Supplementary video related to this article can be found at https://doi.org/10.1016/j.aja.2017.08.002.

The pain intensity was assessed with the numerical rating scale (NRS). The pain kept NRS 0 at rest and on movement. The catheter was removed without trouble. Thereafter, the patient continued physiotherapy with NRS 2 at most and was discharged with no complication.
2. Discussion

The success of the flexor tendon repair surgery at zone 2 consists of successful surgery and following early mobilization in adults.\(^1\) However, the appropriate time for initiating the mobilization program for children is controversial.\(^2\) The continuous block was performed because the early mobilization was chosen by our surgeons.

The continuous median nerve block was sufficient for complete postoperative analgesia and spared the muscle strength in flexor digitorum muscles so that the patient experienced no trouble for mobilization. Although there are several reports on continuous median nerve block for adult hand surgery,\(^3,4\) this is the first report of a successful postoperative pain management with continuous median nerve block for pediatric flexor tendon repair surgery at zone 2. Brachial plexus block (BPB) could be chosen for analgesia of hand surgery. However, BPB interferes active movement. Moreover, the failure rate of continuous BPB is not low.\(^5\) The selective median nerve block is superior to BPB in both viewpoints.

The results could vary significantly depending on where the median nerve is blocked. The motor branch supplying the flexor digitorum superficialis muscle separates from the median nerve at the elbow joint. The anterior interosseous nerve, the motor branch supplying the flexor digitorum profundus muscle, separates from the median nerve at a few centimeters distal to the elbow joint. Therefore, the median nerve catheter at the distal third of the forearm can theoretically spare finger flexion, and the attempt was successful.

Conflict of interest

None.

Funding source

None.

References