Mid-Thigh Approach to Ultrasound Guided Sciatic Nerve Block in Pediatric Patients

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Introduction: The sciatic nerve (SN) block has been shown to provide effective analgesia following a variety of lower extremity surgeries in both adults and children (1). A number of approaches for SN block have been described including anterior, parasacral, transgluteal, infragluteal, lateral, posterior subgluteal, infragluteal–parabiceps, proximal thigh, or at the popliteal fossa. These are based on surface landmarks, but the position of the nerve varies, making the procedure of SN block challenging despite the large size of the nerve (2). Ultrasound guided mid-thigh approach has been shown to be a practical method for SN block in adult patients compared to the traditional approaches (3). We present our preliminary experience of ultrasound-guided mid-thigh SN block for lower extremity surgery in children.

Methods: Ten children aged 7 – 17 years weighing 32 – 92 kg received SN block alone or in combination with a femoral nerve block depending on the location of surgery after induction of general anesthesia. Ultrasound guided femoral block was performed as described by Fingerman et al (4). For SN block, the patients were placed in the lateral decubitus position with the leg to be blocked superior and the hip and knee flexed at 90 degrees. Using SonoSite® M-Turbo® (SonoSite, Bothell, WA 98021) with 10-5 MHz ultrasound probe, a transverse view of SN was identified by directly placing the probe sagittally over the posterior mid-thigh along a line representing the course of the sciatic nerve between the gluteal and popliteal regions. In addition, a longitudinal view of the SN was obtained for verification. A 21Gx4” insulated nerve block needle (B.Braun Stimuplex, Melsungen, Germany) was connected to a nerve stimulator and advanced toward SN in the transverse view using an in-plane approach. As the tip of the needle approached the SN, its position was validated by nerve stimulation with motor response elicited with a current intensity of 0.5 mA or less. Local anesthetic was injected around the nerve under real time ultrasound guidance.

Results: The SN was identified with ultrasound and confirmed by nerve stimulation in all 10 pediatric patients, with excellent images seen in both transverse and longitudinal views in 80% of these patients. In one patient a good image was obtained only in the transverse view, while in another patient the nerve was intermittently identifiable on the ultrasound. There was no cardiovascular response to surgical incision in any of the patients. However, two subjects required fentanyl supplementation for tourniquet pain. In the PACU 8 patients required no additional analgesia. Two patients required only 1 dose of morphine 0.04 and 0.06 mg/kg morphine respectively. Four of the ten patients did not require any rescue analgesia till the morning of the day after surgery. Data on analgesic requirements beyond the PACU discharge were not available for 4 patients.

Discussion: Ultrasound guided mid-thigh approach of SN block offers a simple alternative to traditional gluteal and popliteal approaches. SN can be easily visualized in the posterior mid-thigh area, appearing as an oval-to-elliptical hyperechoic structure in the transverse view and a large cable-like structure in the longitudinal view. Ultrasound guided mid-thigh SN block alone, or in combination with femoral nerve block provided good intraoperative conditions and adequate postoperative pain control for leg and foot surgery. Additional studies will determine the superiority of the mid-thigh approach over other techniques in SN block in children.

References