Agri 2024;36(1):80–82
doi: 10.14744/agri.2023.59375

LETTER TO THE EDITOR

Serratus anterior plane block analgesia for surgical restoration of brachial plexus birth palsy: A different approach for acute pain management

Doğumsal brakial pleksus palsinin cerrahi restorasyonunda serratus anterior plan bloğu analjezisi: Akut ağrı yönetimine farklı bir yaklaşım

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To the Editor,

Serratus anterior plane block (SAPB) is a well-described technique for thoracic wall analgesia in which a single local anesthetic (LA) injection covers a large dermatomal area reaching from T2 to T9. This also represents an advantage compared to intercostal nerve blocks which require multiple injections into a vessel-near area. Children with brachial plexus birth palsy (BPBP) might need surgery in case of shoulder abduction and external rotation disabilities. For such cases, the conjoint tendon (m. Latissimus dorsi and m. Teres major) is transferred to the posterolateral part of the tuberculum majus of humerus through a broad incision on the postaxillary line causing strong postoperative acute pain. One should note, a custom-made thermoplastic shoulder orthosis is applied to the patients to protect the shoulder abducted and externally rotated after the surgery, which may cause further strain pain. Therefore, proficient acute pain management is needed for such surgeries, especially when the population is pediatric.

We would like to share our 4-patient experience with SAPB for BPBP surgeries. After general anesthesia induction, a single-shot 1mg/kg 0.25% Bupivacaine was injected between the serratus anterior and latissimus dorsi muscles (Fig. 1). Our aim was to cover T2-T5 intercostal and thoracodorsal nerves in order to provide analgesia for the postoperative period. The Face, Legs, Activity, Cry, Consolability (FLACC) pain assessment tool was used to evaluate the intensity of pain at the 0th (extubation), 1st, 2nd, 6th, 12th, 18th, and 24th hours (0: no pain, 10: the worst pain). Demographic, surgical, and anesthesiological data including postoperative pain follow-up are summarized in Table 1.

In our daily clinical practice, we observe these children experiencing severe pain because of the surgery itself and thermoplastic shoulder orthoses use. Due to the abducted and externally rotated shoulder, the patient may experience pain not only by the surgical incision but the position itself. They typically require large doses of analgesics. Serratus anterior plane block provides a large dermatomal area (T2-T9) blockade by a single injection.[1] The SAPB clinical experience in pediatric patients has been very limited. Despite mostly being case reports, these publications represent promising alternative indications for SAPB. Kurtz et al.[2] performed it successfully for a large chest wall vascular malformation. Corso et al.[3] used it for a video-assisted thoracoscopic surgery in a spontaneously breathing patient. In a prospective randomized study, Kaushal et al.[4] reported decreased late mean pain scores until the 12th hour and rescue fentanyl requirement in the SAPB group after cardiac surgery.

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Submitted *(Başvuru)* **01.02.2022** **Accepted** *(Kabul)* **16.02.2023** **Available online** *(Online yayımlanma)* **27.12.2023**

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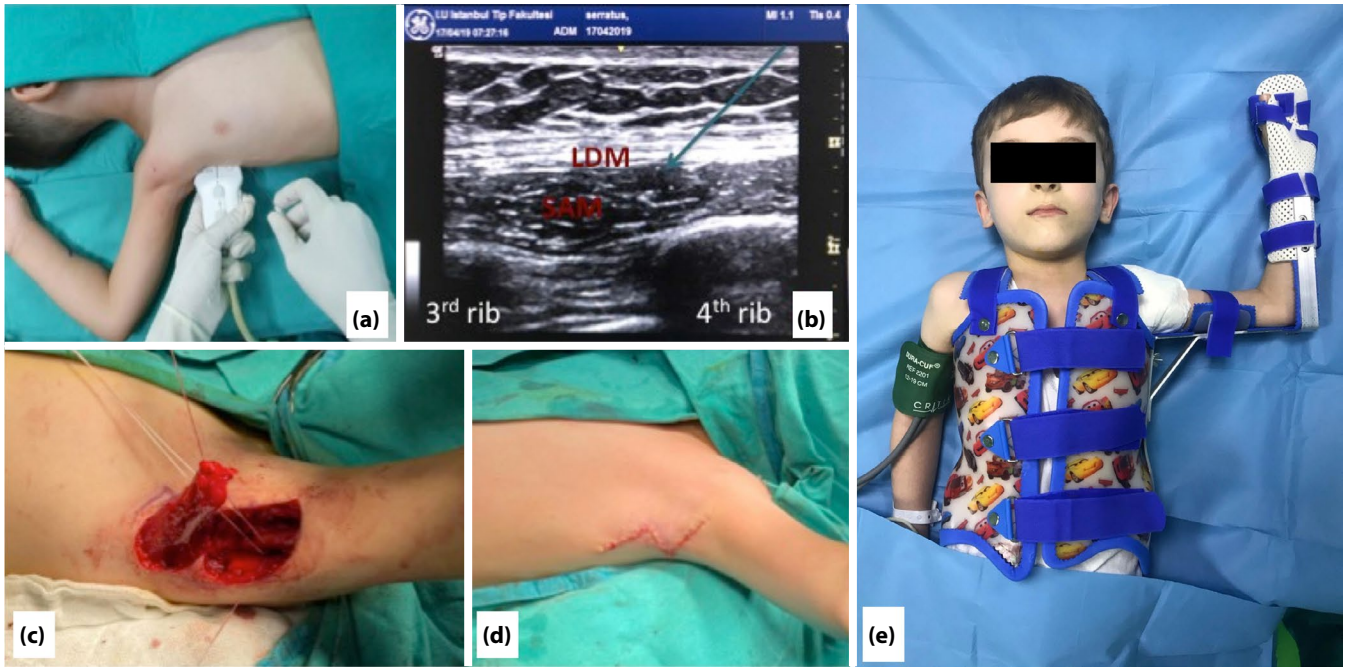

Figure 1. (a) Ultrasound position before performing local anesthetic injection. **(b)** Ultrasonographic image of the block area. LDM: Latissimus dorsi muscle, SAM: Serratus anterior muscle. **(c)** Surgical process. **(d)** Surgical area after skin closure. **(e)** Postoperative image demonstrating the position of the patient after orthosis insertion.

Table 1. Demographics, anesthesia-, surgery-, pain intensity-, serratus anterior plane block (SAPB) analgesia-, and satisfaction-related data of the pediatric patients with brachial plexus birth palsy (BPBP)

	Case 1	Case 2	Case 3	Case 4
Age	4	4	6	9
Gender (F/M)	F	F	M	M
Weight (kg)	20	16	30	35
Surgery duration (min)	60	45	120	90
General anesthesia duration (min)	70	53	134	95
SAPB bupivacaine 0.25% volume (mL)	8	6	12	14
FLACC* pain score 0th min	3	2	2	0
FLACC* pain score 1st h	0	1	3	3
FLACC* pain score 2nd h	5	0	5	0
FLACC* pain score 6th h	1	4	0	0
FLACC* pain score 12th h	0	0	0	0
FLACC* pain score 18th h	1	0	0	1
FLACC* pain score 24th h	2	1	1	2
Time-to-first pain (min)	120	360	110	105
Paracetamol requirement within postoperative first 24 hours (mg)	600 (2x300)	240 (1x240)	900 (2x450)	1575 (3x525)
Meperidine requirement within postoperative first 24 hours (mg)	7 (1x1)	5 (1x1)	10 (1x1)	0
Duration of sleep (h)	8	8	7	7
Surgeon satisfaction$^{\delta}$ (0–3)	3	3	3	3
Parent/patient satisfaction$^{\delta}$ (0–3)	3	3	2	2

*: FLACC (face, legs, activity, cry, consolability) pain assessment tool: Each of the 5 categories is scored between 0 and 2 (0: no pain, 10: the worst pain). δ: Satisfaction score: 0: very unsatisfied, 3: very satisfied.

Serratus anterior plane block has been beneficial for our patients as well. The highest FLACC scores in the first 3 patients were 4 and 5 with decreased consumption of paracetamol and meperidine. In one patient, pain scores were always ≤3 that no meperidine was used. The block prolonged the pain-free period and

lowered the analgesic requirement not only by its opioid-sparing effect but also by opioid-elimination in 1 patient. We implemented SAPB application to our routine practice for this particular BPBP patient population and believe that it could be considered a strong part of the effective and sufficient multimodal analgesia management. With this specific plane block, more benefit may be provided in terms of acute pain management and orthosis-related discomfort. Further prospective and randomized-controlled studies are required.

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