Noriaki Kanaya MD
Hiromitsu Kuroda MD
Masayasu Nakayama MD
Yasuyuki Homma MD
Akiyoshi Namiki MD
Sapporo, Japan

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A continuous perineural infusion of local anesthetic provides effective postoperative pain management after lower limb amputation

To the Editor:

One of the major challenges in the management of patients undergoing major lower limb amputation is to provide adequate pain management in the immediate postoperative period. Epidural anesthesia and patient controlled analgesia represent advances from the traditional regimen of postoperative parenteral narcotics but there are some contraindications and potential systemic side effects. At our institution, we have tried to improve postoperative pain control by using a continuous perineural infusion of local anesthesia using a catheter sited intraoperatively under direct vision into the transected nerve sheath. This is using a technique similar to that described by Fischer.[1] During the amputation, the major nerve (sciatic or tibial) is dissected, infiltrated with 10 mL of 0.25% bupivacaine 10 mL and then transected. A multi-port epidural catheter is brought into the wound away from the main incision and advanced approximately 10 cm into the nerve sheath. An infusion of bupivacaine 0.2% at a rate of 3–6 $mL \cdot hr^{-1}$ is commenced immediately postoperatively. The catheters are removed within five days with the first dressing change. We reviewed the postoperative pain scores and opioid requirements of 12 patients who underwent lower limb amputation using this technique.

TABLE Mean visual analogue scale scores and opioid requirements on postoperative days one and three

	n = 12
VAS scores on POD 1	1.9
VAS scores on POD 3	2.0
Morphine equivalent (mg) on POD 1	11.1
Morphine equivalent (mg) on POD 3	8.9

VAS = visual analogue scale; POD = postoperative day.

There were seven males and five females with a mean age of 72.8 yr. Ten of the 12 patients had a spinal anesthetic. Mean pain scores using a visual analogue scale (VAS) during the first three postoperative days were less than 3 as assessed on days one and three. Therefore, 83% of patients had adequate analgesia as defined by a VAS of 3 or less. None of the patients required parenteral analgesics by day three. Mean morphine equivalent consumption was calculated to be 11.1 mg and 8.9 mg on days one and three. There were no respiratory or wound complications and postoperative confusion occurred in only one patient.

This effective analgesia technique can be used for above and below knee amputations. Enneking *et al.* reported that continuous local anesthetic perfusion of amputated nerves via a catheter placed under direct vision in the neural sheath provided excellent postoperative analgesia in six patients undergoing upper limb amputation.[2] A perineural infusion provides safe, reliable and effective analgesia that can be easily managed on the ward. It is facile for the surgeon to place the catheter under direct vision into the nerve sheath, ensuring the local anesthetic delivery to the precise area in order to maximize postoperative pain management. There may be a potential for it to decrease the incidence and severity of postamputation phantom limb pain.

We would recommend readers to try this simple but effective technique. A randomized prospective trial needs to be done.

Pamela H. Lennox MRCPI FFARCSI
Gerrit B. Winkelaar MD
Hamed Umedaly MD FRCPC
York N. Hsiang MD FRCPC
Vancouver, British Columbia

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A longer pretreatment interval does not improve cisatracurium precurarization

To the Editor:

One report in the literature assessed the value of cisatracurium as a precurarizing agent and, in this report, 0.01 mg·kg^{-1} cisatracurium given three minutes prior to succinylcholine 1.5 mg·kg^{-1} was almost ineffective in preventing succinylcholine-induced fasciculations.[1] We hypothesized that the time interval between cisatracurium and succinylcholine was too short and a longer pretreatment interval, i.e., six minutes rather than three minutes should improve the effectiveness of cisatracurium as a precurarizing agent. Therefore, we assessed the efficacy and the side effects of the same dose of cisatracurium, i.e., 0.01 mg·kg^{-1} given six minutes prior to succinylcholine and compared them with a control group receiving placebo, i.e., NaCl 0.9% six minutes prior to succinylcholine (n = 15 for each group). In all patients anesthesia was induced with fentanyl (1–2 µg·kg^{-1}) and thiopentone (4–7 mg·kg^{-1}) and maintained with remifentanil 0.25 µg·kg^{-1}·min^{-1} and desflurane 2–3% end-tidal in oxygen/air. Exactly five minutes after the injection of the precurarizing dose of cisatracurium or placebo all patients were asked for signs of muscle weakness, i.e., diplopia, heavy eyelids, dysarthria, difficulty in swallowing and dyspnea. The severity of muscle weakness was defined as the number of symptoms (zero to five) mentioned by patients during this interview. Fasciculations after the injection of succinylcholine were recorded according to a four-point rating scale.[2] Moreover, the incidence and the severity of myalgia were assessed 24 hr after surgery with a standardized questionnaire.[3] Compared to pretreatment with placebo, precurarization with 0.01 mg·kg^{-1} cisatracurium six minutes prior to succinylcholine led to a significant reduction of fasciculations (87% *vs* 40%, respectively; $P < 0.05$) but no reduction of myalgia (33% *vs* 20%, respectively; NS). Moreover, this technique was associated with signs of muscle weakness in almost all patients (Table). Thus, cisatracurium 0.01 mg·kg^{-1} given six minutes prior to succinylcholine was not only ineffective in preventing myalgia in a clinical context-the expected reduction of myalgias is the most important reason for pretreating patients exposed to succinylcholine - it was also "highly effective" in producing side effects, i.e., signs of muscle weakness. These side effects may be harmful to patients, leading to pulmonary aspiration of gastric contents prior to intubation or producing significant alterations of pulmonary function.[4,5] In light of our results, we see no convincing evidence supporting the use of cisatracurium as a precurarizing agent.

TABLE Muscle weakness after a precurarizing dose of 0.01 mg·kg^{-1} cisatracurium

	Cisatracurium 0.01 mg·kg^{-1} n = 15	*Placebo (NaCl 0.9%) n = 15*
Incidence	13	3*
Symptoms		
-heavy eyelids	12	3
-diplopia	4	1
-dysarthria	3	0
-dyspnea	2	0
-swallowing difficulty	3	0
Severity		
-one symptom	9	2
-two symptoms	3	1
-three or more symptoms	3	0

Incidence of side effects = number of patients; severity of side effects = number of paralytic symptoms. *$P < 0.05$.

Thomas Mencke MD
Christine Becker MD
Jan Uwe Schreiber MD
Thomas Fuchs-Buder MD
Saarland, Germany

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