Tip adhesions complicate infraclavicular catheter removal

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Received: 11 November 2010 / Accepted: 11 February 2011 / Published online: 26 February 2011
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To the Editor,

Continuous peripheral nerve blocks (CPNBs) are a versatile tool for ambulatory anesthesia because they can offer both surgical anesthesia as well as prolonged postoperative analgesia. For orthopedic procedures in particular, they reduce the need for general anesthesia and opioids with a decreased incidence of nausea and vomiting.¹ However, there are complications with CPNBs that give rise to concern including migration, kinking, knotting,² dislodgement, site infection, and nerve injury. In a previous report, we described additional complications due to shearing in five patients who received continuous nerve blocks with stimulating catheters.³ Those reported complications suggested a dilemma in placing continuous stimulating perineural catheters on an ambulatory basis, i.e., in each case, a return trip to the hospital was required for removal. In this regard, we report tissue adhesions complicating removal of a stimulating catheter. The authors consulted the institutional Ethics Review Board and obtained approval for publication in the *Journal*.

A 46-yr-old male (American Society of Anesthesiologists physical status II, body mass index $29 \text{ kg}\cdot\text{m}^{-2}$) was scheduled for right wrist tumour re-excision and split-thickness skin graft. His medical history was negative except for prior removal of an eccrine tumour on his right wrist. After obtaining the patient's written consent, an ultrasound-guided infraclavicular CPNB with a 19G StimCathTM (Arrow International, Reading, PA, USA) was performed for postoperative analgesia. Ropivacaine 0.2% was infused at $5 \text{ mL}\cdot\text{hr}^{-1}$ with a patient-controlled

analgesia dose of 5 mL every hour. The patient was discharged from hospital the following day. It is routine practice at our institution to discontinue the catheter within 72 hr of placement, which is usually the duration of the volume in the local anesthesia reservoir. In this case, the patient called on postoperative day (POD) 4 with a complaint concerning difficulty removing his catheter. He lived two hours distance from our medical centre and did not want the added drive during the weekend to have the catheter removed. Consequently, the attempted removal at home occurred on POD 4 when the infusion device was empty. During the procedure, the white-coloured polyurethane sheath separated from the coiled omni-port stainless steel tip. Ultimately, successful removal the catheter was achieved on POD 6 by applying steady traction on the catheter and using a reverse Seldinger technique. The patient did not complain of paresthesia during the procedure although the catheter tip was enveloped with tissue (*Figure*); the pathological diagnosis was benign fibrinous tissue.

Since the patient was observed overnight prior to discharge and, possibly more important, because he declined to return to the hospital on POD 4 when he encountered difficulty with removal, the catheter remained in place without local anesthetic infusing for approximately 48 hr. This scenario mimics the findings of Buckenmaier *et al.*⁴ where catheters were left *in vivo* in rats without local anesthetic infusions. While there was a large amount of fibrous tip adhesion found upon catheter removal, it is not known whether it occurred over the course of the almost 48 hr that the local anesthetic was not infusing or whether a portion of it occurred as early as during the continuous infusion. The tip adhesion data from Buckenmaier *et al.* were collected following seven days of catheter maintenance. Our case suggests that fibrous adhesions may occur

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Figure Photo showing adhesion of benign fibrous tissue to the end of the stimulating catheter following its removal. Length from catheter tip to the end of the tissue is 3.34 cm (1.3 in)

more rapidly in humans with this type of catheter in the absence of local anesthetic infusion.

In conclusion, we describe a case of fibrous tissue adhesions complicating infraclavicular stimulating catheter removal. This case corroborates previous laboratory data suggesting that these foreign bodies are a nidus for fibrous

tissue growth.⁴ We suspect that continuous local anesthetic infusion may prevent this tissue reaction entirely or simply may impede its progress. This case suggests that a stimulating peripheral nerve catheter should be removed as soon as possible following the completion of local anesthetic infusion.

Competing interests None declared.

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