Retained stimulating perineural catheter placed with hydrodissection but without nerve stimulation

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To the Editor,

We are concerned about the number of recently published reports in your journal regarding difficult-to-remove ambulatory peripheral nerve catheters, all involving the Arrow Stimucath stimulating nerve catheter.^{1–4} We want to share our own recent experience with a retained Stimucath interscalene catheter that was placed without nerve stimulation in an ambulatory patient.

Our incident occurred in a 29-yr-old, 64-kg woman who presented for shoulder arthroscopy. She consented to a continuous interscalene nerve block for postoperative analgesia. A posterior approach⁵ was used, with a 9-cm, 17-gauge Tuohy needle inserted at the anterior edge of the trapezius muscle. The needle was advanced through the middle scalene muscle under ultrasonographic guidance until the tip of the needle was positioned between the roots of the plexus at approximately the level of C6. Hydrodissection with 5 mL of 5% dextrose solution was then performed to ensure optimal placement. A 19-gauge Arrow Stimucath Catheter (Teleflex Medical, Reading, PA, USA) was inserted without resistance to 1 cm past the tip of the needle. After a negative aspiration, a 5-mL test dose of local anesthetic was injected through the catheter with good spread under ultrasonographic visualization. Finally, the catheter was secured (7 cm depth at the skin) with Dermabond liquid adhesive (Ethicon, Somerville, NJ, USA) and dressed with Tegaderm dressings (3 M Company, St. Paul, MN, USA).

After surgery, the patient was called daily for follow-up. On the third postoperative day, a family member was talked

through the process of removing the catheter. Unfortunately, traction on the catheter resulted in severe “electrical shock” sensations radiating to the patient’s thumb. The patient was instructed to come to our hospital for evaluation. On arrival, the catheter insertion site was found to be somewhat reddened and tender to direct palpation. Under ultrasonographic guidance, sterile saline was injected. It appeared that the catheter tip was approximately 1 cm lateral to the brachial plexus. A computed tomography scan was obtained, which failed to show any evidence of kinks or knotting and confirmed the catheter to be in an appropriate position adjacent to the expected course of the brachial plexus (Figure). With slow, steady traction and continuous massage of the tissues, the catheter was successfully pulled back 2 cm, but localized tenderness at the catheter insertion site prevented further withdrawal. A surgical consult was next obtained. The patient was taken to an operating room, where general anesthesia was induced with propofol and muscle relaxation obtained with succinylcholine. After muscle relaxation, the catheter was removed, tip intact, with aggressive traction by the surgeon. In the postanesthesia care unit, the patient denied paresthesias or pain in her arm. The patient was kept in the hospital overnight for observation. On follow-up the next day, she reported some residual numbness in her right index finger and thumb, but motor function was normal.

The incident was reported to the Food and Drug Administration and the catheter manufacturer; the company could not determine a manufacturing- or design-related cause for the reported event. Two months later, the patient denies any lingering paresthesias and has given written consent to report and publish this case.

Abrahams *et al.*,⁶ Clendenen *et al.*,¹ Duclas *et al.*,² Moran *et al.*,⁷ Brenier *et al.*,³ and Tran *et al.*⁴ have recently published case series or case reports of retained nonkinked or nonknotted Arrow Stimucath stimulating continuous

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Figure Axial and coronal planes from a computed tomography scan show the tip of the continuous nerve block catheter (black arrows) between the anterior and middle scalene muscles. The nerve block catheter shows no evidence of knotting or kinking. Some fluid and air are evident, which are consistent with prior injection through the catheter in this region

nerve block catheters. Our case, being the first to describe a retained catheter placed with hydrodissection under ultrasonographic guidance and without electrical stimulation, helps show that there is probably no method of placement that can reliably avoid the complication of a retained catheter. Our case also challenges the hypothesis of Abrahams *et al.* that it is the combination of ultrasonography and nerve stimulation that creates conditions that lead to catheter incarceration and that hydrodissection is therefore preferable.⁶ Although we believe that the Arrow

Stimucath is, in general, a safe, useful, overall excellent product (and we will continue to use it in various clinical settings), we have concerns about its continued use in our ambulatory patient population. Based on our experience and our review of the literature, we are transitioning to use of nonstimulating nerve catheters for ambulatory patients but will likely continue to utilize our hydrodissection technique.

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Competing interests None declared.

References

1. Clendenen SR, Robards CB, Greengrass RA, Brull SJ. Complications of peripheral nerve catheter removal at home: case series of five ambulatory interscalene blocks. *Can J Anesth* 2011; 58: 62-7.
2. Duclas R Jr, Robards CB, Ladie BL, Clendenen SR. Tip adhesions complicate infraclavicular catheter removal. *Can J Anesth* 2011; 58: 482-3.
3. Brenier G, Salces A, Magues JP, Fuzier R. Peripheral nerve catheter entrapment is not always related to knotting. *Can J Anesth* 2010; 57: 183-4.
4. Tran QD, Gordon A, Asenjo JF, de la Cuadra-Fontaine JC. Retained and cut stimulating infraclavicular catheter. *Can J Anesth* 2005; 52: 998-9.
5. Mariano ER, Loland VJ, Ilfeld BM. Interscalene perineural catheter placement using an ultrasound-guided posterior approach. *Reg Anesth Pain Med* 2009; 34: 60-3.
6. Abrahams MS, Noles LM, Cross R, Horn JL. Retained stimulating perineural catheters: a report of four cases. *Reg Anesth Pain Med* 2011; 36: 476-80.
7. Moran KR, Arbona FL, Khabiri B, *et al.* The need for patient teaching, follow up, and physician availability for the prevention of outpatient perineural catheter complications. *Internet Journal of Pain, Symptom Control and Palliative Care* 2011; 8 (2).