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Ambulatory Continuous Perineural Infusion: Are We Ready?

To the Editor:—Klein *et al.*¹ recently presented two cases of continuous perineural infusion of local anesthetics for the treatment of prolonged postoperative pain in an ambulatory setting. These cases deserve the following comments.

1. Patients undergoing outpatient procedures deserve the same level of care as if they had remained in the hospital. In our practice, in which continuous perineural infusions are frequently used for total joint replacements (shoulder, ankle, hip, and knee), catheters are evaluated at least once a day to verify that they provide the expected sensory block and that the site is clear and there is no leaking, inflammation, or infection. We typically prefer approaches that allow a direct visual inspection of the site. For this reason, we favor the use of a lateral approach² rather than the posterior approach chosen by Klein *et al.*¹ for continuous infusions at the popliteal fossa. We also insist on removing these catheters ourselves.

Transferring the responsibility for the care of these catheters to the patient seems to be inappropriate. After discharge, many patients undergoing same-day surgery are home alone for extended periods of time. Because confusion is one of the early symptoms of local anesthetic toxicity, one can question whether the patient or a significant other could qualify as a proper substitute to a trained healthcare professional. Several telephone calls from a trained healthcare professional and follow-up visits represent the minimum postoperative involvement.

2. Local anesthetics are intrinsically toxic; therefore, they should always be used at the minimum effective dose. The use of a device that allows an infusion at a rate of only 10 ml/h obviously does not allow any adjustment. In contrast, there are ambulatory pumps that offer variable basal rate combined with a patient-control analgesia (Sorenson Medical, West Jordan, UT). These patient-controlled analgesia pumps allow us to use smaller rates of infusion at which local anesthetics are administered and to adapt to any additional patient needs.

3. The technique described does not allow confirmation that the catheter was properly positioned in the first patient. By injecting 30 ml ropivacaine, 0.5%, before introduction of the catheter, the authors induced motor and sensory blocks that lasted long after the patient's discharge. The second patient was more lucky; although the pump was connected 7 h after the initial bolus injection, she remained in the hospital long enough for verification that the infusion of 0.2% ropivacaine at a rate of 10 ml/h may have produced the desired sensory block. Given the potential local anesthetic toxicity and the possible complications of the perineural infusion techniques, it is important to confirm the intensity of the sensory block before discharge. The authors may want to consider using the technique described by Ayers and Enneking,³ which is based on an initial injection of 3 to 4 ml local anesthetic solutions using the introducing needle, followed by catheter placement and injection of the remaining volume of local anesthetic through the catheter. With this technique, it is possible to verify that the catheter is well-positioned before the patient's discharge.

4. Like the authors, we also perform popliteal blocks for patients undergoing similar surgery. Although in the past we preferred the use of the single-injection techniques, we are evaluating continuous infusions for outpatient surgery. However, independent of the technique, our protocol includes calling the patient the day of and week after surgery to verify the absence of complications and the quality of postoperative pain control.

5. It is of special interest to recognize that the sensory saphenous nerve blocks (without continuous infusion) were effective for 2 and 23 h, respectively. Because 0.5% ropivacaine produced a block of similar duration in the sciatic and femoral territories, is it possible that the benefits were mostly a result of the initial bolus injection?

Last, after confirmation from B. Braun Medical, Inc. (Bethlehem, PA), we would like to mention that this company did not manufacture 100-mm insulated needles, but rather 89-mm insulated needles.

In our opinion, the appropriate approach for ambulatory perineural infusion should include the use of an electronic pump with patient-controlled analgesia and, most importantly, close monitoring of the patient by a trained professional.

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In Reply:—We thank Chelly *et al.* for their interest in our case report that described major ambulatory surgery with continuous regional anesthesia and a disposable infusion pump. Although we appreciate their comments, we believe the use of continuous local anesthetic infusions at home is an investigational area of pain control. As a result, despite their institutional bias, many of the issues they highlight, such as the ideal location of catheter placement, dosing method and regimen, and appropriate patient follow-up, remain to be defined with evidence-based medicine. The case report represents a novel application of available technology to highlight the potential benefit this method could have for outpatient pain management, not a definitive treatment algorithm.

As we attempt to define an appropriate standard of care for ambulatory perineural infusion, vigilance concerning the risk of local anesthetic toxicity occurring outside of the hospital is essential. In our group, we go to great lengths to avoid such complications. The description by Chelly *et al.* of patients being sent home with brief instructions and a phone number is inaccurate. As we mentioned in the case report, careful patient selection is essential. In addition, at our institution, the standard of care for each patient is to receive 24-h, 7-day, and 3-week follow-up telephone calls, which are tracked in an automated database. Individual patients are also followed-up at home by physician house calls and home healthcare nurses. Deciding the level of care is based on individual clinician judgment on a case-by-case basis.

We agree with Chelly *et al.* that ambulatory care should provide the same level of care as in-patient care. However, we believe that ambulatory care can provide the same quality of health care as in-patient care, without the same level of nursing and medical intervention suggested by Chelly *et al.* Removing a continuous local anesthetic catheter at home is one example. Patients routinely remove surgical drains that lie within joint spaces and wounds without the supervision of a physician. Extending this to perineural catheters seems feasible. Furthermore, choosing the appropriate anatomic site for catheter insertion should be based on the site of surgery, patient habitus, and desired postoperative analgesia, not to simply facilitate a clinician's ease of view of the catheter site.

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The rapid growth of ambulatory anesthesia and the evolution of outpatient surgical techniques will demand that we move forward from traditional pain management strategies. This will necessitate incorporation of the numerous successful variations in community practice. Given the 50 h of postoperative analgesia provided with this technique in an ambulatory setting, the success we have seen in placing more than 1,000 continuous local anesthetic catheters for inpatient treatment in our ambulatory care unit, and the success discussed in the literature, we believe further investigation of outpatient continuous local anesthetic catheters is warranted. It is our goal to define the safety and effectiveness of this treatment method by prospective randomized trials performed by a core of professionals interested in developing this field, and not simply by individual or institutional tradition.

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Nonopioid Analgesia Improves Outcomes

To the Editor:—The recent article by Greif *et al.*,¹ highlighted in *The New York Times* Science section on November 9, 1999, published a reduction in postoperative nausea and vomiting (PONV) rate from 30% to 17% using supplemental postoperative oxygen. Although this would appear to be an impressive improvement, both of these rates fall well within the 15–40% PONV rate usually cited for this problem. The anesthetic regimen included the routine use of opi-

oids in the form of 1–3 $\mu\text{g}/\text{kg}$ fentanyl during induction, and more for maintenance.

Macario *et al.*² confirmed the primacy in patients' perspectives of the avoidance of PONV. Tang *et al.*³ recently published an article regarding the superiority of nonopioid analgesia using local anesthesia instead of opioids for reducing PONV and for greater patient satisfaction. Ponnudurai *et al.*⁴ recently published an article regarding the