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Multiorifice Catheters Are Required to Maximize the Benefits of Intermittent Bolus Continuous Regional Techniques

To the Editor:

In Charous *et al.*'s comparison of continuous *versus* intermittent bolus techniques for continuous femoral nerve block,¹ the authors concluded that "the study did not find evidence to support the hypothesis that varying the method of local anesthetic administration – basal infusion *versus* repeated bolus doses – influences continuous femoral nerve block to a clinically significant degree." However, no mention was made of the study design with respect to the use of an end-hole perineural catheter rather than a multi-orifice design.

The demonstrated benefits of the intermittent bolus technique over the continuous technique (improved analgesia,²⁻⁴ reduced local anesthetic requirement,² and perhaps better differential sensory-motor block) are thought to be enhanced by multi-orifice flow;^{5,6} and thus, to maximize these benefits, a multi-orifice catheter is required. Flow from a multi-orifice catheter depends on flow rate: below 80 ml/h, multi-orifice catheters function as single-orifice catheters; above 100 ml/h, they progressively function as multi-orifice catheters.⁷ Therefore, a continuous-only regimen will likely only deliver single-orifice flow, whereas an intermittent bolus technique will likely deliver multi-orifice flow.⁷ Multi-orifice flow results in better local anesthetic spread,^{5,6} and it is this better spread that is

thought to be responsible for the improved block characteristics with the intermittent bolus technique: improved analgesia and reduced local anesthetic consumption (for a given analgesic effect). Recent evidence also suggests that by enabling a local anesthetic dose reduction through the use of the intermittent bolus technique, a higher sensory-to-motor block ratio can be achieved (less motor block for a given analgesic effect).⁸ Although some studies have demonstrated benefits using the intermittent bolus technique with end-hole catheters,⁹ the majority have incorporated a multi-orifice design.^{2-4,8}

We, therefore, do not believe that the conclusion "it is doubtful that, when using continuous femoral nerve block, varying local anesthetic administration will provide an increased sensory-to-motor block ratio" is yet warranted.

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In Reply:

References 2-6 of our colleagues' letter all involved epidural infusion,¹⁻⁵ with references 2-4 suggesting analgesia is improved using repeated bolus doses compared with a simple