

# Quadratus Lumborum Block in Total Hip Replacement: Comment

To the Editor:

We read with great interest the article by Brixel *et al.*<sup>1</sup> entitled “Posterior Quadratus Lumborum Block in Total Hip Arthroplasty” published in May 2021 in *ANESTHESIOLOGY*. We appreciate the authors’ great work; however, after reading the article carefully, we also found some worthwhile issues that we would like to raise to the investigators.

First, the authors mentioned that this study was a double-blind trial. Contrary to the authors’ claim, the patients were not blinded. Since the authors graphically mapped cutaneous sensory loss in figure 4 in the article, patients in the ropivacaine group were aware that they had been injected with a local anesthetic.

Second, the authors indicated that the anesthesiologist recorded the final solution spread on an anatomical diagram. However, the article did not mention when it was recorded. In our opinion, the diffusion of the local anesthetic varied over time, and when the anesthesiologist documented that it was quadratus lumbar block 2, after a while, it may have spread to quadratus lumbar block 1 + 2 + 3.

Third, the authors have assessed the extent of sensory blockade in the nine hip areas with a cold glass vial. However, the authors did not measure whether there was sensory loss over a wider range, including the areas of femoral and obturator innervation. Next, the authors suggested that obturator and femoral nerves were not blocked after posterior quadratus lumborum block, which may contribute to the lack of analgesia. However, the innervation of the hip joint is primarily provided by the articular branches of obturator and femoral nerves,<sup>2</sup> which could not be measured by cutaneous sensation.

## Research Support

This letter was supported by the National Natural Science Foundation of China (grant No. NSFC 81772130) and the National Key R&D Program of China (grant No. 2018YFC2001800).

## Competing Interests

The authors declare no competing interests.

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(Accepted for publication July 20, 2021. Published online first on September 8, 2021.)

# Quadratus Lumborum Block in Total Hip Replacement: Reply

In Reply:

We thank Hu *et al.*<sup>1</sup> for their comments on our work<sup>2</sup> and for giving us the opportunity to further clarify our findings.

First, we note that this study was a double-blind trial because the anesthesiologist, investigator, and patient were blinded to the exact solution administered (saline or ropivacaine). Additionally, data collection investigators were different across the recovery room and surgical ward. With respect to patient blinding, patients were not educated on whether to attribute muscular weakness or loss of cold sensation to the surgery or to the analgesic block. Indeed, as noted in the Results section, 12 patients (24%) in the ropivacaine group did not report a loss of cold sensation in the hip area. Additionally, at 2 h after extubation, significant motor weakness was observed in one patient in both groups.

Second, the final solution spread on ultrasound was recorded on an anatomical diagram at the end of the injection. We have found that this ultrasound image of the final injectate deposition was dynamic and not visibly maintained after block completion, due to rapid resorption of the injectate. In all the fascia plane blocks, the positive pressure ensures the macroscopic spread of the solution toward a zone of lower resistance. In our study, we observed that the macroscopic dispersion of injectate into a virtual space tended to depend on tissue compliance rather than needle tip position. The macroscopic dispersion reported in our anatomical diagram, called

bulk flow or mass flow, is rapidly followed by a microscopic dispersion,<sup>3</sup> invisible to ultrasound. Local anesthetic can cross fascial layers even in the absence of macroscopic perforations.<sup>3</sup> Finally, there is resorption of the injectate by both lymphatic and vascular systems.<sup>3</sup> Consequently, as pointed out by Chin *et al.*,<sup>3</sup> the potential mechanisms of analgesic action of fascial plane blocks can be divided into (1) a local effect on nerves in the vicinity of injection and (2) a systemic effect secondary to vascular dispersion. Separate from the mechanism of action, our study focused on contributing to the literature with respect to this question, “Is a quadratus lumborum block effective for pain relief after hip surgery?” Our study,<sup>2</sup> and similarly, a recent trial by Haskins *et al.*,<sup>4</sup> reported that respectively a posterior or an anterior quadratus lumborum block, when combined with multimodal analgesia, does not decrease morphine consumption or pain scores after hip surgery.

Third, as noted in our figure, there was no loss of cold sensation superior to the 12th rib margin or inferior to the upper third of the thigh with a posterior quadratus lumborum block. The subdivision of loss of cold sensation in nine areas allowed us to quantify the frequency of variously distributed sensory loss. We acknowledge the comment from Hu *et al.*<sup>1</sup> that the innervation of the anterior capsule is primarily provided by the articular branches of the obturator and femoral nerves. In our study, we note that there was no femoral nerve blockade (both sensory and motor), and we postulate that this may explain the lack of analgesic effect reported in our study. Our findings contrast with other quadratus lumborum blocks described. Diffusion to the lumbar plexus after an anterior quadratus lumborum block has been reported in two cadaveric studies,<sup>5,6</sup> and a case report described a femoral blockade after a lateral quadratus lumborum block.<sup>7</sup>

### Competing Interests

Dr. Choquet receives funding from Milestone Scientific (Livingstone, New Jersey) and General Electrics (Boston, Massachusetts) for research unrelated to this work. The remaining authors declare no competing interests.

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DOI: 10.1097/ALN.0000000000003945

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(Accepted for publication July 20, 2021. Published online first on September 8, 2021.)

## Risk of Postoperative Pulmonary Complications: Comment

### To the Editor:

We read with the interest the report by Li *et al.*<sup>1</sup> of their single-center retrospective registry analysis on reversal of neuromuscular blockade and postoperative pulmonary complications. No difference in the odds of postoperative pulmonary complications was observed between patients receiving sugammadex (4.2%) or neostigmine (5.9%) (adjusted odds ratio, 0.89; 95% CI, 0.65 to 1.22). This result is consistent with the largest prospective cohort study<sup>2</sup> and the two small randomized controlled trials<sup>3,4</sup> to date, but contrasts with a much larger