

The Clinical Considerations of Interscalene Brachial Plexus Block in the Treatment of Post-Hepatectomy Shoulder Pain [Response to Letter]

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Dear Editor

In the commentary on our previously published article,¹ the authors have raised numerous constructive suggestions and significant concerns. We consider these concerns to be beneficial for the clinical application of interscalene brachial plexus block in managing postoperative shoulder pain. Consequently, we address these concerns in our response.

In our previous study, we identified epidural anesthesia as a risk factor for postoperative shoulder pain after hepatectomy.² In our published paper, we noted that the use of epidural postoperative analgesia could more effectively manage incisional pain postoperatively. In clinical practice, the majority of anesthesiologists do not prefer postoperative intravenous analgesia for the prevention of shoulder pain. We posit that selecting intravenous analgesia postoperatively, concurrent with an epidural block, could further increase the risk of incisional pain in patients. In the design of our study, epidural postoperative analgesia was utilized by both patient groups. Although epidural analgesia may increase the overall risk of postoperative shoulder pain, it does not introduce confounding bias in intergroup comparisons. Postoperative intravenous analgesia was not employed in our study, as utilizing two types of postoperative analgesia in a single study could increase confounding bias. Consequently, further research is warranted to elucidate the effect of interscalene brachial plexus block on shoulder pain in the context of intravenous analgesia.

The development of phrenic nerve-sparing block techniques is progressing rapidly. In our study, the interscalene brachial plexus block was selected primarily for its dual mechanism: its ability to infiltrate the phrenic nerve to address referred pain and to provide peripheral blockade, thereby alleviating shoulder pain induced by surgical positioning. Prior research has demonstrated that intraoperative noxious stimuli, which irritate the diaphragm and are transmitted via the phrenic nerve to the C3-5 dermatomes, constitute the predominant mechanism for referred pain following hepatic surgery. Consequently, our trial design did not include forgoing intervention on the phrenic nerve. Regarding the comparison of interscalene brachial plexus block with other nerve blocks, this was not addressed in our study. The aim of our study was to initially establish the efficacy of interscalene brachial plexus block and subsequently, via additional non-inferiority trials, assess its comparative effectiveness against other nerve blocks for managing postoperative shoulder pain.

We concur that the quality of patient recovery is also an important postoperative outcome measure. In our study, we conducted a preliminary comparison of patient satisfaction. Recovery scales commonly used, such as the Quality of Recovery-15, include various factors such as respiration, nutrition, pain, sleep quality, postoperative nausea and vomiting (PONV), and psychological state. Typically, patients' respiratory function has returned to a safe status by the time they are discharged from the post-anesthesia care unit. To date, no studies have demonstrated the impact of brachial plexus block on nutritional status and PONV; pain remains our primary follow-up indicator. Postoperative sleep quality and psychological state, including depression and anxiety, are closely associated with pain. Indeed, in our study, a significant

factor was the patient's assessment of motor and sensory disturbances in the upper limb following brachial plexus block. Notably, some patients reported discomfort due to arm numbness post-block, which resulted in decreased satisfaction. This represents an inevitable consequence of our intervention and a significant limitation. Consequently, in the discussion section of our article, we highlighted the potential benefits of using a lower concentration of ropivacaine in future attempts to mitigate this side effect.

The commentary highlighted the absence of long-term follow-up for complications in our study. Long-term complications encompass shoulder pain and those related to the intervention. Shoulder pain following hepatectomy is predominantly attributed to surgery-related traumatic stimuli and postoperative inflammatory factors that irritate the diaphragm, with alleviation typically observed after three days. The majority of patients express dissatisfaction with shoulder pain within the first two postoperative days; therefore, our study focused less on the chronicity of acute shoulder pain. We did not record complications associated with the interscalene brachial plexus block in our study. During the trial design, we acknowledged that the small sample size limited the significance of long-term complication follow-up. Furthermore, given the maturity of the interscalene brachial plexus block technique, we did not prioritize assessing its adverse reactions in this study. Nonetheless, we find the reader's opinion to be valuable. A prior study with a more extensive sample size noted that approximately 5% of patients experienced persistent sensory disturbances and hypoesthesia as adverse reactions three months post-interscalene brachial plexus block.³ Consequently, we concur that the potential impact of long-term complications should be taken into account when administering interscalene brachial plexus block to patients with shoulder pain. We would like to extend our sincere gratitude to the readers and editors for their attentive consideration of this paper. While our findings indicate that interscalene brachial plexus block significantly alleviates shoulder pain, further research is necessary to ensure its safe and effective widespread application in clinical practice. It is our hope that these responses will aid readers in discerning the benefits and limitations of this intervention, thereby fostering the refinement of the intervention and enhancing the management of postoperative shoulder pain.

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Disclosure

The authors report no conflicts of interest in this communication.

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