JCS Journal of Chest Surgery
https://doi.org/10.5090/jcs.24.034
pISSN: 2765-1606 eISSN: 2765-1614
J Chest Surg. 2024;57(3):300-301

Commentary

Commentary: Exploring the Potential of Serratus Anterior Plane Block for Severe Pain Management after the Nuss Operation: Is It the Optimal Solution?

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ARTICLE INFO
Received April 2, 2024
Accepted April 2, 2024

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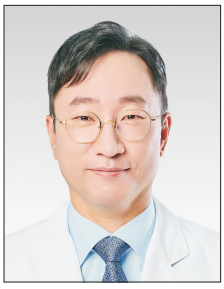

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The Nuss operation, a cornerstone of thoracic surgery, is renowned for its efficacy in correcting chest wall deformities, but it is also notorious for the significant postoperative pain it frequently causes. This pain is the result of a complex interplay of factors related to the surgical intervention itself and the subsequent mechanical changes in the chest wall. Patients experience a range of discomforts, from the trauma inflicted during the operation to the pressure applied by the Nuss bars on the chest wall and the irritation of intercostal nerves. Additionally, factors such as inflammation and psychological responses can exacerbate postoperative pain, underscoring the importance of a holistic approach to pain management.

Addressing the complex nature of pain following the Nuss procedure, researchers have increasingly focused on regional anesthetic techniques such as the serratus anterior plane block (SAPB) as a promising method for pain relief. Significant contributions to the literature on SAPB began to appear in the mid-2010s, with Blanco et al. [1] at the forefront, pioneering its use and demonstrating its effectiveness in managing pain. Their research, which highlighted the ability of SAPB to provide extended pain relief, set the stage for its further investigation in a variety of surgical settings. One of the earliest applications in thoracic surgery was introduced by Madabushi et al. [2], who used the technique on a young patient undergoing an esophagectomy via thoracotomy, resulting in notable pain reduction. This case spurred numerous subsequent studies.

SAPB functions by blocking the lateral cutaneous branches of the intercostal nerves, thereby attenuating the sensory input from the chest wall [3]. This technique offers 2 main approaches: superficial SAPB, which targets the sensory nerves above the serratus anterior muscle, and deep SAPB, performed below the muscle. While some studies favor the deep SAPB approach for its efficacy in controlling post-surgical chest pain [4], conflicting results have prompted a closer examination of its benefits compared to superficial SAPB. Notably, recent research by Qiu et al. [5] suggests that superficial SAPB may provide longer-lasting pain relief, making it a more viable option for patients undergoing thoracoscopic operation. Given the potential for complications like pneumothorax with deep SAPB, the superficial approach emerges as a safer and more reasonable choice. Ka et al. [6] suggests that superficial SAPB could provide substantial pain relief after Nuss operation.

However, SAPB is not without its limitations. The suc-

cess of the procedure is heavily dependent on the practitioner's proficiency, which can be challenging for novice clinicians. Identifying the precise plane between the serratus anterior muscle and the latissimus dorsi muscle can be particularly daunting, especially without the use of advanced imaging techniques such as sonography. Additionally, the insertion of the catheter into this narrow plane requires skill and precision, highlighting the importance of adequate training and experience. Furthermore, while SAPB is effective in blocking the cutaneous branches of the intercostal nerves, it does not directly alleviate pain caused by the impact of Nuss bars on the intercostal nerves within the thorax.

Furthermore, it is worth noting that while SAPB primarily targets the cutaneous branches of the intercostal nerves, it may not directly alleviate pain caused by the impact of Nuss bars on the intercostal nerves within the thorax. Cryoablation offers a potential alternative for managing this type of pain. However, the author suggests that SAPB might have advantages over cryoanalgesia due to logistical factors, such as the need for a double-lumen endotracheal tube, videoscope-assisted intrathoracic procedures, and specialized cryoinstruments. While this argument has some validity, it is important to consider differing evidence in the literature. For example, the study by Song et al. [7] on cryoablation for patients undergoing the Nuss procedure indicated that only single-lumen intubation was required, which was made possible by carbon dioxide insufflation. Additionally, the use of a videoscope in thoracic surgery provides convenience and precision, potentially making direct nerve ablation under visual guidance more straightforward than ultrasound-guided techniques.

In conclusion, the quest for effective pain management strategies during recovery after the Nuss procedure is an evolving field, informed by an expanding knowledge of pain mechanisms and advances in regional anesthesia techniques. SAPB shows potential in mitigating postoperative pain; however, its limitations warrant the investigation and comparison of other methods, such as cryoablation. Comparative studies of these techniques are crucial for improving pain management strategies and patient outcomes in the complex context of post-Nuss procedure recovery.

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Author contributions

All the work was done by all authors.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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