



Multi-Modal Pain Reduction for Post-Operative Thoracic Surgery Patients

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BACKGROUND

After reviewing an article in the Journal of Perianesthesia Nursing entitled “Efficacy of Ice Compress Combined With Serratus Anterior Plane Block in Analgesia After Thoracoscopic Pneumonectomy: A Randomized Controlled Study”, the professional governance team for the Marlton PACU felt like a similar project would benefit the VATS, Thoracotomy, and Robotic Thoracotomy patient population in Marlton.

- The professional governance team spoke with Dr. Puc (Our Thoracic Surgeon) to discuss the study along with findings that use of a nerve block and ice pack improved pain management for this population and he agreed.
- In Marlton, the multi-modal pain regimen was already in place. Patients were scheduled to receive Tylenol and gabapentin in the pre-operative area, and around the clock post-operatively. Toradol, another effective post-operative pain management tool was given to most patients, apart from 1 or 3 in the study who didn't receive Toradol second to kidney function or age. Lidocaine patches were also used in a few patient cases as an additional intervention. Every patient received magnesium, which helps reduce post operative myalgia.
- The article that prompted this project, “Efficacy of Ice Compress Combined With Serratus Anterior Plane Block in Analgesia After Thoracoscopic Pneumonectomy: A Randomized Controlled Study” used a serratus anterior plane block, however the surgeon at Virtua in Marlton prefers using erector spinae and intercostal nerve blocks. The article, “Comparing Erector Spine Plan Block with Serratus Anterior Plane Block for Minimally Invasive Thoracic Surgery: A Randomised Clinical Trial” from the British Journal of Anaesthesia, shows better effectiveness with an erector spinae and intercostal nerve block as opposed to a serratus anterior plane block.

The PACU Professional Governance team received IRB review for this quality improvement project.

OBJECTIVES

Reduction of narcotic use during hospital stay after ice application to chest tube site in the immediate 24 hour post-operative period for VATS, Thoracotomy, and Robotic Thoracotomy patients.

METHOD

We looked retrospectively in patient charts for Dr. Puc's VATS, Robotic Thoracotomy, and Thoracotomy patients who did not have ice pack applications from 1/1/2024-2/29/2024 to collect 24 hour post operative narcotic use.

- Starting 3/1/2024, PACU started placing ice packs on incision sites for the above patients.
- We developed a log (not part of medical record) to travel with the patient to track ice use on the incision site for 24 hours in the Intensive Care Unit.
- Nurses and the ANC for Marlton ICU were educated on use of ice pack for pain reduction, the tracking log, and journal articles.
- Logs were collected from 3/1/24-5/31/24 to track narcotic use of patients who received ice pack intervention (no patient identifiers were used in data collection).
- All narcotics, including Fentanyl, Dilaudid (Hydromorphone), Morphine, Oxycodone, and Tramadol were converted to Morphine milliequivalents (MMEs).
- Pre-trial MME for the 15 patients is 17.9 MME per patient, with a total of 269 MME.

VATS/Thoracotomy Ice Application Hand Off Tool

Patient Sticker

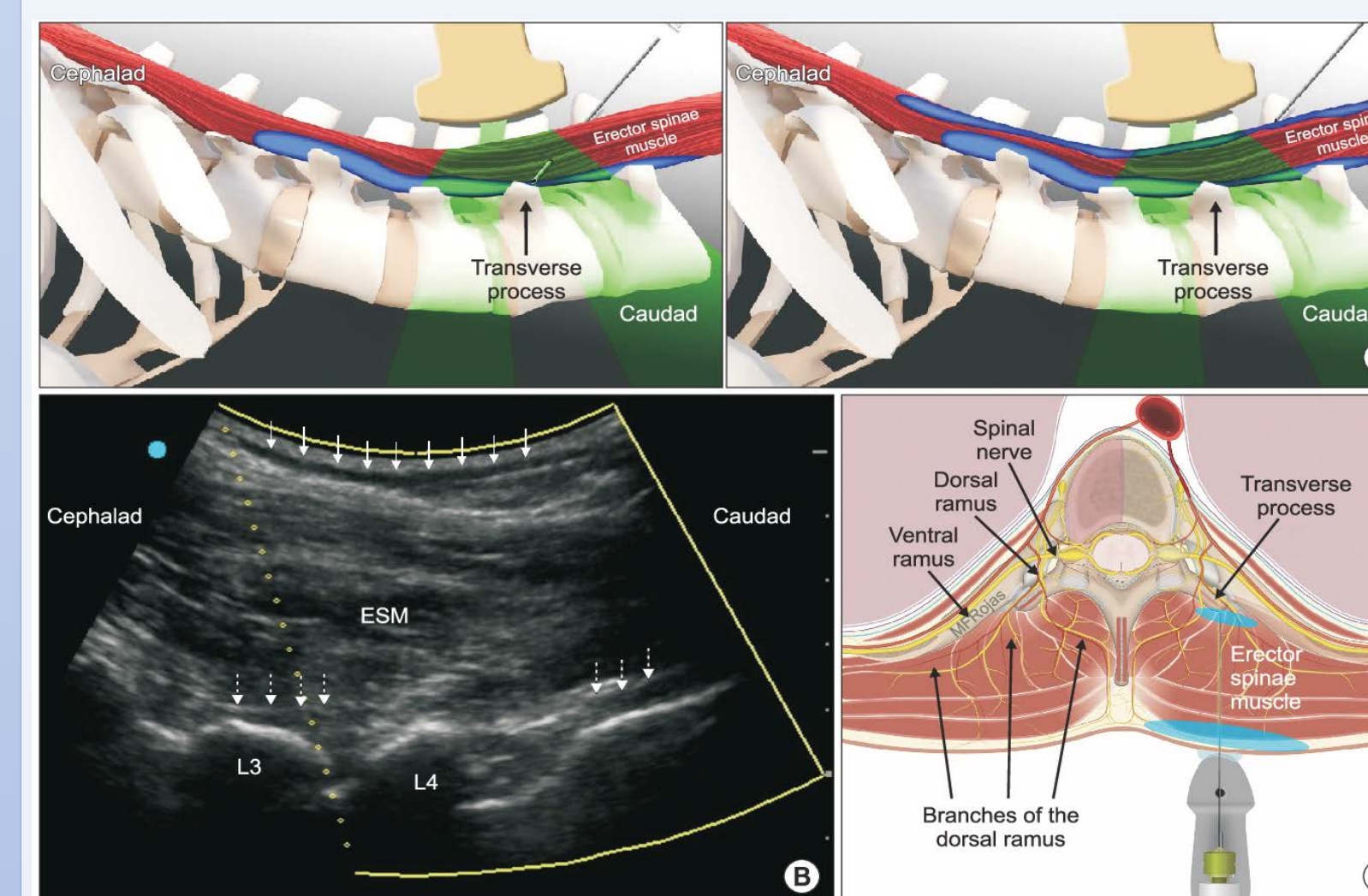
Please record date and time of ice application 40 minutes on 40 minutes off for 24 hours post op.

Time of Initial Ice Pack Application=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=
• On @=	Off @=

RESULTS

While initial findings suggest a potential reduction in narcotic use with the addition of ice packs to the multi-modal pain regimen, the study faced challenges:

- There are 15 patients in the pre-intervention group, and 11 in the post-intervention group.
- Based on the data collected, all but one patient had erector spinae and intercostal nerve blocks.
- Out of the patients monitored in this survey, 4 patients refused application of the ice pack overnight.
- From the dates 3/1/24-5/31/24, there were potentially 26 patients to study the ice pack intervention, the PACU professional governance team received 11 logs from the Intensive Care Unit.
- Post-ice implementation MME per patient is 17.5, however the overall MME for the post group is 192.5, totaling less than the 269 from the pre-implementation group.
 - The PACU team was incredibly surprised to learn that Tramadol PO equaled 10MME while Dilaudid (Hydromorphone) 0.5mg IVP was 2 MME.



IMPLICATIONS FOR PRACTICE

The integration of ice packs in a multi-modal pain management strategy for VATS patients shows promise in reducing narcotic consumption and improve patient outcomes in the post-operative setting.

- There could have been 26 potential patients in the study, however the PACU Professional Governance received 11 logs, missing 15 total. This could be for a few reasons: lack of staff buy in, better education, or more consistent communication between the two units.
- Incomplete patient logs and difficulties in achieving full staff compliance impacted data collection and implementation consistency.
- The PACU team could have done better educational rounding in the ICU or the project could have been modified to focus on the time periods when the patient was awake.

Another important thing to consider in the future is IV narcotic use versus PO narcotic use. Vital factors need to be taken into consideration moving forward including previous narcotic history, IV drug abuse history, and history of prior thoracic surgeries.

Moving forward, Our Thoracic Surgeon will be putting ice application in his post-operative order set. This is a great start to consider other types of patients who would benefit from ice post-operatively.

REFERENCES

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