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Blocking the Pain Away: Addition of peripheral nerve blockade to sedation with monitored anesthesia care in medical thoracoscopy

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The clinical question

How does adding peripheral nerve block (via interfascial plane block) to sedation with monitored anesthesia care (MAC) affect the procedural times, pain medication use, and safety for medical thoracoscopy procedures?

Take Home Message

The addition of peripheral nerve block via interfascial plane block to sedation with MAC was safe and may reduce pain medication requirements & procedural times for medical thoracoscopy. However, the optimal protocol for peripheral nerve blockade remains uncertain, warranting future prospective trials.

Background

Medical thoracoscopy (MT) is a minimally invasive procedure for the evaluation and management of pleural disorders. As compared with video-assisted thoracoscopic surgery (VATS), MT does not require general anesthesia or single-lung ventilation, making it especially useful for patients with a higher burden of comorbidities.

However, pain is common during & after MT. Usual intra- and post-procedural pain management is achieved via local anesthesia & intravenous opioids with light to moderate sedation. Since MT is often done under MAC sedation and is generally performed in a sicker patient population, minimizing the use of intravenous sedation (and particularly opioids) is preferable.

There have been numerous studies on peripheral nerve blocks (PNB) for MT, which have largely been small feasibility studies without comparator groups. For those with comparator groups, addition of interfascial plane blocks [erector spinae plane block (ESPB)] & serratus anterior plane block (SAPB)] have not been compared with MAC sedation alone.

Study design

Study design: Retrospective cohort study of adults undergoing medical thoracoscopy (N = 90) at a single urban academic center from January 2021 to September 2023.

Primary outcomes: Procedure times, intra-procedural opioid analgesia use, complications of PNB

Secondary Outcomes: In-room and anesthesia times, post-procedural opioid analgesia use, intra-procedural sedation use

Exposure: Addition of an interfascial plane block (either erector spinae plane block or serratus anterior plane block) to monitored anesthesia care. Anesthetic technique was at the discretion of the attending anesthesiologist, which included:

- Whether an interfascial plane block was performed.
- Which interfascial plane block to perform.
- The agent & dose of anesthetic for the block.
- The doses of intravenous sedation & analgesia used intra-procedurally.

Population

Inclusion criteria: Adults undergoing medical thoracoscopy at a single academic urban center from January 2021 to September 2023.
Exclusion criteria: Receipt of general anesthesia.

Procedure Details:

- 23 patients received PNB in addition to MAC. 67 patients received MAC sedation alone.
- Of those who received PNB, 14 received an erector spinae plane block, and 9 received a serratus anterior plane block.
- Majority of the procedures were performed in an endoscopy suite with an interventional pulmonary fellow present.
- Of the procedures including PNB, none were performed in the OR, and the rigid pleuroscope was used for the majority of the MTs (22/23 or 95.7%). Of the procedures without PNB, 13 were performed in the OR, and 43 total involved use of a flexible pleuroscope.

Patient Details:

- The patients included in the study were elderly (median age 67 [IQR 55.0-75.0] in PNB group and 70 [IQR 64.0-76.5] in no PNB group) and were not obese (median BMI 25.3 [IQR 21.4, 29.0] in PNB group and 22.7 [IQR 20.7, 26.0] in no PNB group).
- Majority of participants had pre-procedure ASA grades 3 or 4 (21/23 in the PNB group and 61/67 in the no PNB group), indicative of severe systemic disease.

Outcomes

Primary outcome

- Procedure time was lower in those who received PNB (34.0 min, IQR 27.5-38.0) compared to those who did not receive PNB (40.0 min, IQR 34.0-48.5); p = 0.007.
- Intra-procedural opioid use was lower in those who received PNB (3.0 morphine milliequivalents or MME, IQR 0.0-4.5) compared to those who did not receive PNB (6.0 MME, IQR 3.0-6.0); p <0.001.

Secondary outcomes:

- In-room time for the patient was lower for those who received PNB (53.0 min, IQR 44.0-57.5) compared to those who did not receive PNB (68.0 min, IQR 58.0-76.5); p <0.001.
- Anesthesia time was similar for those who received PNB (72.0 min, IQR 57.0-79.5) compared to those who did not receive PNB (74.0, IQR 65.0-81.0).
- Dexmedetomidine was not used in the procedures that involved the addition of PNB. Propofol use was not abstracted.
- No difference in post-procedural opioid use in the PACU.

Adverse events

- No complications related to PNB were reported.

Commentary

Strengths:

- Largest cohort study evaluating regional anesthesia & peripheral nerve blocks in medical thoracoscopy.
- First reported study to evaluate serratus anterior plane block in medical thoracoscopy.
- Generally incorporated a “sick” population by ASA status, where reducing procedural time and opioid use is paramount.
- Rich data collection from the electronic health record allowed for a “real world” evaluation of the effectiveness of peripheral nerve block.

Limitations:

- There was significant heterogeneity of the intervention arm, as the attending anesthesiologist determined whether and how a block was performed. This may lead to selection bias in which patients were and were not given a peripheral nerve block.
- It remains unclear to what degree confounding contributed to the difference in these outcomes. Difference in procedure time was adjusted for whether IPC insertion was performed, the type of pleuroscope used, and the presence of an interventional pulmonology fellow. However, it remains possible that other patient or provider characteristics explain the difference in procedure times or opioid analgesic use.
- Majority of the population was not obese by BMI. This may limit the external validity of using PNB with patients who have higher BMIs.

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Article Citation

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Suggested Reading

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