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Best Pain Management After Video-assisted Thoracoscopic Surgery: A Best Evidence Topic Report

Introduction
A best evidence topic was structured following ICVTS protocol guidelines. Postoperative pain management remains crucial for patient recovery and quality of life after thoracic surgery.

Three-Part Question
What is the gold standard technique for postoperative pain management in patients undergoing video-assisted thoracoscopic surgery (VATS)?

Clinical Scenario
A 62-year-old male scheduled for VATS lobectomy, previously experienced severe thoracotomy pain. Pain control options include TEA (traditional gold standard), TPVB, ESPB, SAPB, intercostal nerve blocks, opioids, and NSAIDs. A literature review was initiated to determine the optimal pain management strategy for VATS.

Search Strategy
Databases: PubMed and Medline (2014–2024).
MeSH terms: *Thoracic Surgery, Video-Assisted, VATS, pain management, postoperative pain, gold standard.*
Inclusion:Studies focusing solely on VATS,

Why This Question Is Important
Postoperative pain can impair recovery, daily functioning, mental health, and overall quality of life. Chronic pain increases healthcare costs and can diminish patient satisfaction after life-saving surgeries. Effective pain management is critical, particularly in the era of minimally invasive surgery. This review seeks to identify the most effective and evidence-based strategy for pain control following VATS.

Clinical Bottom Line
Tailored regional anesthesia techniques significantly improve postoperative pain management and recovery after VATS. **TPVB** stands out as the most effective method. **ESPB** and **SAPB** are also viable alternatives. Combining techniques with adjuncts such as intravenous dexamethasone and lidocaine may further optimize pain management strategies.

Table-1. Best Evidence Papers

Author, Date, Journal, Country (Study Type & Level of Evidence)	Patient Group	Outcomes	Key Results & Conclusion
<i>Li et al. (2023)</i> <i>BMC Anesthesiology, China (Meta-analysis, Level 1)</i>	12 RCTs (837 pt.s) undergoing VATS	Postoperative pain scores, opioid consumption, hospital stay, PONV, dizziness	SAPB effectively reduces pain, opioid use, and PONV. No significant impact on hospital stay. SAPB is beneficial for postoperative pain and PONV management.
<i>Spaans et al. (2023)</i> <i>ICVTS, Netherlands (Meta-analysis, Level 3)</i>	51 studies (5573 pt.s) undergoing VATS	Pain scores, hospital stay, PONV, opioid use, rescue analgesia	Regional analgesia is becoming more popular than TEA for VATS. Despite study limitations, TEA's use cannot be definitively encouraged or discouraged.
<i>Sandeep et al. (2022)</i> <i>Int J Surg, China (Network meta-analysis, Level 2)</i>	38 RCTs (2224 pt.s)	Opioid consumption, pain intensity, PONV	TPVB reduces morphine demand and is more effective than ICNB and ESPB. TPVB is the preferred method for analgesia, with ESPB as a viable alternative.
<i>Jiang et al. (2023)</i> <i>Wideochir Inne Tech Małoinwazyjne, China (Network meta-analysis, Level 3)</i>	61 RCTs (4468 pt.s)	Morphine consumption, pain scores, hospital stay, PONV	TPVB and ESPB are more effective than SAPB and ICNB. TPVB ranks best for pain management; ESPB is also effective.
<i>Holm et al. (2024)</i> <i>Eur J Anaesthesiol, Denmark (RCT, Level 2)</i>	810 Pt.s undergoing VATS	Postoperative pain, morphine consumption, hospital stay, side effects	Epidural analgesia significantly reduces pain and morphine use compared to oral morphine. No significant difference in hospital stay or side effects between groups.
<i>Sung Sung et al. (2024)</i> <i>J Clin Anesth, Taiwan (RCT, Level 3)</i>	100 Pt.s undergoing VATS	Postoperative pain, opioid consumption, side effects	Study compared various regional blocks and found that certain blocks were superior in specific outcomes, though the overall benefit of TEA remains in question.
<i>Løbel et al. (2024)</i> <i>Dan Med J, Denmark (RCT, Level 2)</i>	37 Pt.s undergoing VATS	Opioid consumption, Time to full mobilization	IV dexamethasone in VATS may reduce the need for opioids and facilitate early mobilization.
<i>Zhang et al. (2024)</i> <i>Int Wound J, China (Retrospective observational study, Level 2)</i>	100 pt.s scheduled for elective VATS	Postoperative pain, morphine consumption, recovery time	PNB combined with general anesthesia significantly reduced immediate postoperative pain and analgesic needs.
<i>González-Santos et al. (2024)</i> <i>J Clin Med, Spain (RCT, Level 3)</i>	181 Pt.s undergoing VATS	Postoperative pain, opioid consumption, side effects	ITM can be considered adequate for postoperative pain control in VATS, compatible with early discharge protocols.
<i>Hojski et al. (2024)</i> <i>J Thorac Disease, Switzerland (RCT, Level 3)</i>	79 pt.s undergoing VATS	Postoperative pain, opioid consumption, side effects	IV lidocaine reduced pain scores post-VATS, with limited beneficial effects; useful as part of multimodal analgesia.
<i>Leviel et al. (2024)</i> <i>Eur J Cardiothorac Surg, France (RCT, Level 2)</i>	156 pt.s undergoing VATS	Pain intensity, opioid consumption, recovery time	Combination of PVB and SAPB provided better pain management and quicker recovery compared to either block alone.

RCT: Randomized controlled trial, Pt.: Patient, VATS: Video-assisted thoracoscopic surgery, PONV: Postoperative nausea and vomiting, SAPB: Serratus anterior plane block, TEA: Thoracic epidural analgesia, TPVB: Thoracic paravertebral block, ICNB: Intercostal nerve block, ESPB: Erector spinae plane block, IV: Intravenous, PNB: Paravertebral nerve blockade, ITM: Intrathecal morphine, PVB: Paravertebral block