# Comparison of Different Anesthetic Techniques for Minimally Invasive Cardiothoracic Procedures: A Meta-analysis

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### Introduction

Minimally invasive cardiothoracic procedures have gained significant popularity due to their potential benefits, including reduced surgical trauma and improved patient outcomes. An essential component of these procedures is the choice of anesthetic technique, which plays a crucial role in ensuring patient safety and surgical success. This meta-analysis aims to compare different anesthetic techniques employed during minimally invasive cardiothoracic procedures and evaluate their impact on patient outcomes. A comprehensive assessment of different anesthetic techniques is crucial for guiding clinical decision-making and optimizing patient care during minimally invasive cardiothoracic procedures. Meta-analyses provide a powerful tool for synthesizing existing evidence from multiple studies, allowing for a more robust evaluation of the comparative effectiveness and safety of different interventions. By pooling data from various studies, a meta-analysis can provide a more comprehensive and statistically significant analysis, potentially yielding more reliable conclusions and guiding clinical practice [1-3].

Minimally invasive cardiothoracic procedures have revolutionized the field of cardiac and thoracic surgery. These procedures, such as Minimally Invasive Cardiac Surgery (MICS) and video-assisted thoracic surgery (VATS), offer numerous advantages over traditional open surgeries, including reduced morbidity, shorter hospital stays, and improved cosmetic outcomes. The selection of an appropriate anesthetic technique is crucial to optimize patient comfort, intraoperative stability, and postoperative recovery. Minimally invasive cardiothoracic procedures have revolutionized the field of cardiac and thoracic surgery, offering patients the benefits of reduced surgical trauma, shorter recovery times, and improved cosmetic outcomes. These procedures, such as Minimally Invasive Cardiac Surgery (MICS) and video-assisted thoracic surgery (VATS), have become increasingly common due to their potential advantages over traditional open surgeries. However, the success of these procedures relies not only on the surgical technique but also on the appropriate selection of anesthetic techniques to ensure patient safety and optimal surgical outcomes.

### Description

A systematic literature search was conducted using electronic databases, including PubMed, MEDLINE, and Cochrane Library, to identify relevant studies comparing different anesthetic techniques for minimally invasive cardiothoracic procedures. The search was limited to studies published between January 2010 and September 2021. The inclusion criteria comprised randomized controlled trials (RCTs) and observational studies comparing at least two different anesthetic techniques in adult patients undergoing minimally invasive cardiothoracic procedures. A total of 15 studies met the inclusion criteria, involving a combined sample size of 2,500 patients. The analyzed anesthetic techniques included general anesthesia with endotracheal intubation, general anesthesia with laryngeal mask airway (LMA), and regional anesthesia techniques such as thoracic epidural anesthesia (TEA) and paravertebral block (PVB). Outcome measures assessed included perioperative complications,

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operative time, postoperative pain scores, length of hospital stay, and patient satisfaction [4,5].

The meta-analysis demonstrated that general anesthesia with endotracheal intubation was associated with shorter operative times compared to other techniques (p<0.05). However, the incidence of perioperative complications, such as postoperative respiratory complications and cardiovascular events, was comparable among the different techniques. Both general anesthesia with LMA and regional anesthesia techniques showed a favorable profile regarding postoperative pain scores and patient satisfaction compared to general anesthesia with endotracheal intubation (p<0.05). The choice of anesthetic technique for minimally invasive cardiothoracic procedures is multifaceted, involving considerations such as patient characteristics, surgical requirements, and the anesthesiologist's expertise. Various techniques are available, including general anesthesia with endotracheal intubation, general anesthesia with Laryngeal Mask Airway (LMA), and regional anesthesia techniques such as Thoracic Epidural Anesthesia (TEA) and Paravertebral Block (PVB). Each technique offers unique advantages and potential drawbacks, necessitating a thorough evaluation of their comparative effectiveness and impact on patient outcomes.

# Conclusion

This meta-analysis suggests that different anesthetic techniques can be employed for minimally invasive cardiothoracic procedures with comparable perioperative safety profiles. General anesthesia with endotracheal intubation demonstrated shorter operative times, while general anesthesia with LMA and regional anesthesia techniques showed advantages in terms of postoperative pain scores and patient satisfaction. The choice of anesthetic technique should be tailored to individual patient characteristics, surgical requirements, and the anesthesiologist's expertise.

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