



Pain Control and Opioid Use After Abdominal Surgery: How Thoracic Epidural Variables Shape Outcomes

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Introduction

- Thoracic epidural analgesia (TEA) is a common regional anesthesia technique widely used for abdominal surgery, providing superior analgesia and reducing opioid requirements compared to systemic opioids [1,2,3].
- While there is substantial data on the efficacy of TEA for postoperative pain control, few studies have stratified outcomes based on various epidural procedural factors.
- This study evaluates how factors like epidural analgesic agent and placement level affect postoperative pain and opioid use.

Methods

- Retrospective chart review was performed of adult patients who underwent abdominal surgery with thoracic epidural placement.
- Data collected included demographics, epidural characteristics, pain scores, and adjunct opioid use (converted to MME).
- Data was analyzed using t-tests, one-way ANOVA, and simple linear regression.

Results

Epidural Placement Characteristics	
Characteristic	Value
Number of placement attempts	Median 2 (IQR 1)
Length of placement procedure, minutes	Median 15 (IQR 10)
Most Common Placement Levels	
T12-L1	N = 68 (38.6%)
T8-T9	N = 31 (17.6%)
T9-T10	N = 25 (14.2%)
T10-T11	N = 25 (14.2%)
Medication Administered	
Hydromorphone + Bupivacaine	N = 96 (54.5%)
Fentanyl + Bupivacaine	N = 64 (36.4%)
Bupivacaine	N = 9 (5.1%)
Hydromorphone + Ropivacaine	N = 7 (3.9%)
Required Initiation of PCA Postop	
No	N = 136 (77.2%)
Yes	N = 40 (22.7%)

Optimizing thoracic epidural outcomes requires attention to placement strategy and medication combinations, which can enhance pain control and reduce opioid requirements.



Results, cont.

- 176 patients (median age 62, 54% male), with 73% classified as ASA III.
- Patients with a successful epidural (did not require PCA) had lower pain scores while the epidural was in place (p=0.009) and required fewer adjunct opioids (p<0.001).
- Bupivacaine alone administered through the epidural was associated with higher pain scores at three time points compared to hydromorphone + bupivacaine (p<0.05).
- Patients who received fentanyl + bupivacaine required ~5 more units of adjunct opioid per day compared with hydromorphone + bupivacaine (p=0.03).
- Epidural placement at T9-T10 was associated with lower pain scores at 3 time points (p>0.05) and ~7 fewer units of adjunct opioid per day (p=0.046) when compared with placement at T12-L1.

Discussion

- Fluoroscopic or ultrasound guidance may facilitate higher thoracic epidural placement.
- Addition of a long-acting opioid component to the epidural provides superior analgesia.
- Findings could be used to inform standardized protocols favoring early epidural failure detection, thoracic placement, and opioid + local anesthetic agents.

References

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