

Continuous Thoracic Epidural Analgesia As An Adjunct To General Anaesthesia For Modified Radical Mastectomy : A Case Report

Submitted: 05 Sep 2026

Revised: 14 Sep 2026

Accepted: 20 Sep 2026

Published: 30 Sep 2026

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How to cite this article: Dr. Ardra Gopal, Dr. Dhivya M Jacob, Dr. Sunny Alex.

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ABSTRACT

Modified Radical Mastectomy (MRM) is associated with moderate to severe postoperative pain, which may impair respiratory function, delay mobilization and adversely affect recovery. Effective perioperative analgesia is therefore an important component of anaesthetic management. Thoracic epidural analgesia (TEA), when combined with general anaesthesia, provides effective analgesia and may reduce perioperative opioid requirements.

We present the case of a 73-year-old female with carcinoma of the right breast who underwent Modified Radical Mastectomy under general anaesthesia supplemented with thoracic epidural analgesia. A midline thoracic epidural catheter was inserted at the T6–T7 interspinous space. Following a successful test dose, an adequate bilateral thoracic sensory block was established. The relevant sensory distribution for breast and axillary surgery predominantly involves the T2–T6 dermatomes. Continuous epidural infusion of 0.5% ropivacaine at 4 mL/hour was initiated prior to induction of general anaesthesia. Intraoperative analgesia was supplemented with intravenous paracetamol infusion. The intraoperative period was haemodynamically stable, and the patient was extubated uneventfully. Postoperatively, epidural analgesia with 0.2% ropivacaine provided effective pain relief with blood pressure monitoring.

This case highlights the role of thoracic epidural analgesia as an effective component of multimodal analgesia in patients undergoing Modified Radical Mastectomy.

Keywords: Modified Radical Mastectomy, thoracic epidural analgesia, ropivacaine, paracetamol, postoperative analgesia, breast cancer surgery.

INTRODUCTION

Modified Radical Mastectomy is associated with significant postoperative pain due to extensive surgical dissection involving the breast and axillary region. The sensory innervation of the breast is complex, with major thoracic contribution arising from the T2–T6 intercostal nerves, while the axillary region has an important contribution from the T2 intercostobrachial nerve. Inadequate postoperative analgesia may interfere with respiratory function, delay early mobilization and negatively influence recovery.

Optimal pain management is therefore essential for enhancing postoperative comfort and facilitating early recovery. Effective perioperative analgesia is therefore an important component of anaesthetic management.

Multimodal analgesia involves the combination of analgesic techniques and agents acting through different mechanisms, thereby providing additive or synergistic analgesic effects while reducing reliance on systemic opioids.

Thoracic epidural analgesia provides segmental analgesia combined with paracetamol infusion and can reduce the requirement for systemic opioids. It can be incorporated with general anaesthesia as part of a multimodal analgesic strategy.

We present a case of a 73-year-old female undergoing Modified Radical Mastectomy in whom thoracic epidural analgesia was used as an adjunct to general anaesthesia as part of a multimodal analgesic strategy. of a preterm neonate with left upper lobe CLE undergoing lobectomy, highlighting the strategies employed to minimize perioperative risk.

CASE PRESENTATION

A 73-year-old female, classified as ASA physical status II, diagnosed with infiltrating ductal carcinoma of the right breast, was posted for Modified Radical Mastectomy.

There were no other known comorbidities. On examination, the patient was conscious and oriented. Her pulse rate was 82/min, blood pressure was 130/80 mmHg, and oxygen saturation was 98% on room air. Systemic examination was within normal limits.

Airway assessment revealed mouth opening >3 finger breadths, Mallampati class II and full range of neck movements. Preoperative investigations were within normal limits.

Ultrasonography of the right breast revealed an irregular hypoechoic lesion measuring approximately 1.60 × 0.68 cm in the 9 o'clock position, with a few calcifications. Few right axillary lymph nodes with increased cortical thickness were also noted, with the largest measuring 5.4 mm. Histopathological examination was consistent with ductal carcinoma of the breast.

Two-dimensional echocardiography showed an ejection fraction of 66%, mild pulmonary arterial hypertension and mild mitral regurgitation, with concentric left ventricular hypertrophy. There was no regional wall motion abnormality and left ventricular systolic function was normal.

ANAESTHETIC MANAGEMENT

After standard preoperative preparation and monitoring, a midline thoracic epidural was performed at the T6–T7 interspinous space using an 18G Tuohy epidural needle. The targeted space was identified

by loss of resistance to air. The skin to epidural depth was 5 cm, and around 5 cm of the epidural catheter was inserted in the epidural space in the cephalad direction.

A test dose of 3 mL of 2% lignocaine with adrenaline (1:200,000) was administered, following which a sensory block height of T2–T6 was achieved after 10 minutes. A continuous epidural infusion of 0.5% ropivacaine at 4 mL/hour was then initiated prior to induction of general anaesthesia.

General anaesthesia was subsequently induced. An opioid-free analgesia protocol was followed with intravenous paracetamol infusion administered as part of a multimodal analgesic strategy intraoperatively. Throughout the procedure, haemodynamic parameters remained stable. At the completion of surgery, the patient was extubated uneventfully and transferred for postoperative monitoring.

POSTOPERATIVE MANAGEMENT

Postoperatively, epidural analgesia was continued using 0.2% ropivacaine at 3 mL/hour, with regular blood pressure and haemodynamic monitoring.

Intravenous paracetamol and tramadol infusion was used as rescue analgesic when required for breakthrough pain.

Postoperative pain was assessed using the Visual Analogue Scale (VAS) at appropriate postoperative intervals.

The epidural technique provided effective postoperative analgesia and formed an important component of the multimodal pain management strategy.

DISCUSSION

Modified Radical Mastectomy involves extensive tissue dissection and axillary region exploration, which can result in significant acute postoperative pain. Effective analgesia is important not only for patient comfort but also for facilitating early mobilization and recovery.

The sensory innervation of the breast is complex. The major cutaneous sensory supply is derived from the anterior and lateral branches of the thoracic intercostal nerves, predominantly T2–T6. The axillary region also receives important sensory input through the intercostobrachial nerve, usually arising from T2. In addition, the pectoral muscles receive innervation from the medial and lateral pectoral nerves, while supraclavicular nerves contribute to sensation over the superior portion of the breast.

Epidural analgesia provides segmental blockade of thoracic afferent pathways and can provide effective analgesia for breast and chest wall surgery. In addition to reducing pain, regional analgesic techniques may reduce the requirement for systemic opioids and thereby minimize opioid-related adverse effects.

In the present case, a thoracic epidural catheter was placed at the T6–T7 level, with a sensory block height of T2–T6 achieved bilaterally. Continuous ropivacaine infusion was used intraoperatively and postoperatively, combined with paracetamol infusion. The use of an opioid-free intraoperative analgesic protocol was an additional component of the multimodal approach.

The patient remained haemodynamically stable throughout the procedure and was extubated successfully. Postoperative epidural ropivacaine provided continued analgesia with appropriate blood pressure monitoring and assessment via postopera-

tive epidural ropivacaine provided continued analgesia with appropriate blood pressure monitoring and assessment via postoperative VAS scores.

Previous reports have described thoracic epidural analgesia as an effective technique for patients undergoing Modified Radical Mastectomy, particularly when good postoperative pain control and reduction in systemic opioid requirements are desired.

Multimodal Analgesia Considerations

Multimodal analgesia relies on the additive or synergistic combination of drugs acting at various points on the pain pathway. Typical combinations include local anaesthetic wound infiltration or regional techniques and routine NSAIDs with small doses of opioids added as needed.

In breast surgery, regional anaesthetic techniques can provide effective analgesia and reduce systemic opioid requirements. Thoracic epidural analgesia can therefore be combined with systemic non-opioid analgesics such as paracetamol to provide a broader analgesic strategy. Regional techniques including thoracic epidural, paravertebral, PECS, and serratus plane blocks have all been described for breast surgery.

For unilateral MRM, thoracic paravertebral and serratus plane blocks offer targeted alternatives with less haemodynamic effect. Thoracic epidural analgesia can be combined with local anaesthetic infiltration or peripheral nerve/fascial plane blocks to improve analgesic coverage, particularly for axillary dissection. Regional techniques such as thoracic paravertebral block, PECS block or serratus plane block may be combined with general anaesthesia and have been associated with improved postoperative pain scores and reduced opioid requirements. However, epidural analgesia

may still be beneficial when extensive axillary dissection is performed or when prolonged, continuous, and reliable analgesia is required for postoperative care, taking into consideration institutional expertise and availability.

The choice of technique depends on the extent of surgery, expected pain distribution, and patient factors. In the present case, thoracic epidural analgesia was selected as the primary regional technique and was combined with intravenous paracetamol as part of a multimodal analgesic approach.

Postoperatively, continuation of epidural ropivacaine with paracetamol and rescue tramadol provided multiple complementary analgesic mechanisms. This approach is particularly relevant in elderly patients, in whom minimizing unnecessary systemic opioid exposure is beneficial due to the potential for opioid-related adverse effects such as sedation, respiratory depression, nausea, vomiting, and delayed recovery.

It is important to recognise that thoracic epidural analgesia may not completely cover all neural structures involved in MRM because the breast and axilla receive contributions from thoracic, cervical, and pectoral nerve territories. Nevertheless, when appropriately performed and combined with systemic analgesics, thoracic epidural analgesia can form an effective component of a multimodal analgesic strategy.

CONCLUSION

Thoracic epidural analgesia can provide effective perioperative pain control in patients undergoing Modified Radical Mastectomy. Its use as an adjunct to general anaesthesia can contribute to opioid-

-sparing or opioid-free analgesia intraoperatively and may facilitate postoperative recovery.

A multimodal analgesic strategy combining thoracic epidural ropivacaine, intravenous paracetamol, and rescue tramadol provides complementary analgesic mechanisms and may improve postoperative comfort while reducing dependence on systemic opioids. Appropriate assessment of postoperative pain using VAS, together with haemodynamic monitoring during epidural infusion, allows analgesic therapy to be individualized according to the patient's requirements.

Incorporating thoracic epidural analgesia into a multimodal analgesic protocol can improve perioperative comfort and potentially enhance recovery following breast cancer surgery.

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