



# Enhancing Recovery in Geriatric Patients with Thoracic Combined Spinal-Epidural Anesthesia

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## DESCRIPTION

The aging population is a global phenomenon that has led to a significant increase in the number of elderly patients undergoing various surgical procedures. Anesthesia management in these patients poses unique challenges due to the physiological changes associated with aging, as well as the presence of multiple comorbidities. Thoracic Combined Spinal-Epidural (CSE) anesthesia is a technique that combines the benefits of both spinal and epidural anesthesia, offering a balanced approach for managing pain and anesthesia in geriatric patients undergoing thoracic surgeries.

Aging brings about several physiological changes that impact anesthetic management. Cardiovascular changes include decreased cardiac output, increased systemic vascular resistance, and diminished baroreceptor sensitivity, all of which can alter hemodynamic responses to anesthesia. Respiratory changes such as reduced lung elasticity, decreased chest wall compliance, and a higher risk of postoperative pulmonary complications also need to be considered. Renal and hepatic function declines with age, affecting drug metabolism and excretion, necessitating careful dosing and monitoring of anesthetic agents. By providing segmental anesthesia, thoracic CSE can reduce the need for high doses of systemic anesthetics, thereby maintaining better hemodynamic stability. This is vital for elderly patients who are more susceptible to hemodynamic fluctuations. Combining spinal and epidural techniques allows for effective intraoperative anesthesia and postoperative analgesia. The epidural catheter can be used for continuous pain relief, reducing the need for opioids and their associated side effects, such as respiratory depression and delirium. The local anesthetics used in CSE provide adequate anesthesia and analgesia, reducing the need for systemic anesthetics that can have prolonged effects in elderly patients due to altered pharmacokinetics.

With thoracic CSE, patients often experience a quicker return to baseline functional status, which is beneficial for early mobilization and reducing the risk of postoperative

complications like deep vein thrombosis and pulmonary embolism. The thoracic CSE technique involves the insertion of both a spinal needle and an epidural catheter at the thoracic level. This requires expertise to avoid potential complications such as dural puncture, spinal cord injury, and local anesthetic toxicity. A careful assessment of the patient's anatomy, including any spinal deformities or previous spinal surgeries, is essential for successful placement. Proper positioning is critical to facilitate the identification of anatomical landmarks and ensure patient comfort. The patient can be positioned in the lateral decubitus or sitting position, depending on the practitioner's preference and the patient's condition. After identifying the appropriate intervertebral space, usually between T7 and T10, a combined needle-through-needle technique is employed. The epidural needle is first inserted, followed by the spinal needle through the epidural needle to administer the intrathecal dose of local anesthetic. Subsequently, an epidural catheter is threaded into the epidural space. The choice of local anesthetics and their dosages must be tailored to the individual patient, taking into account their age, weight, and overall health status. Commonly used local anesthetics include bupivacaine and ropivacaine, often combined with opioids such as fentanyl or morphine for enhanced analgesia. Hypotension is a common concern, particularly in elderly patients with limited cardiovascular reserve. Prophylactic measures such as preloading with fluids, judicious use of vasopressors, and careful titration of anesthetics can mitigate this risk. The use of opioids in the epidural space can cause respiratory depression. Close monitoring of respiratory rate and oxygen saturation is essential, and naloxone should be readily available to reverse opioid effects if necessary. Although rare, direct injury to the spinal cord or nerve roots can occur. Meticulous technique and thorough knowledge of spinal anatomy are crucial in preventing such injuries. Immediate recognition and management of any signs of neurological impairment are vital. Aseptic technique is paramount to prevent infections such as epidural abscess or meningitis. Signs of infection should be promptly evaluated, and appropriate antimicrobial therapy initiated if needed. Post-Dural Puncture

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Headache (PDPH) can occur if there is inadvertent dural puncture with the epidural needle. Management includes

hydration, analgesics, and, in severe cases, an epidural blood patch.