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CASE REPORT REGIONAL ANESTHESIA

Safe use of combined spinal-epidural anesthesia in a high-risk elderly woman undergoing bipolar hemiarthroplasty: a case report

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ABSTRACT

Elderly patients with multiple comorbidities present a significant challenge during major orthopedic surgeries such as hip arthroplasty. The combined spinal-epidural (CSE) technique offers a balanced approach by providing rapid-onset anesthesia with the advantage of postoperative analgesia.

We report the case of a 68-year-old woman with right intertrochanteric and intracapsular neck of femur fractures scheduled for bipolar hemiarthroplasty. Her comorbidities included hypertension, type 2 diabetes mellitus, coronary artery disease with angioplasty, GOLD stage II COPD (FEV1 62%), and a prior cerebrovascular accident. She was on aspirin and rosuvastatin for secondary prevention. Preoperative findings included mild concentric left ventricular hypertrophy, grade 1 diastolic dysfunction, hemoglobin of 9.2 g/dL, and room air saturation of 90% (improving to 96% on 3 L/min oxygen), with no signs of acute COPD exacerbation. A CSE technique was performed at the L3–L4 level using 2 mL of 0.5% hyperbaric bupivacaine (10 mg) with 25 mcg fentanyl intrathecally, and an epidural catheter was placed for postoperative analgesia. A T10 sensory level was achieved with stable intraoperative vitals. Postoperatively, pain was effectively managed with VAS ≤3/10 using 0.125% bupivacaine 8 mL every 6 hours via the epidural catheter, and no rescue analgesia was needed. The patient was mobilized with assistance on postoperative day one and had an uneventful recovery. This case report highlights that with careful patient selection, the CSE technique can offer a safe and effective alternative to general anesthesia in high-risk geriatric patients.

Abbreviations: CSE: combined spinal-epidural, COPD: Chronic obstructive pulmonary disease, FEV1: Forced expiratory volume in 1 sec, VAS: Visual Analogue Scale

Keywords: Combined spinal-epidural anesthesia; bipolar hemiarthroplasty; elderly; diastolic dysfunction; COPD; stroke; angioplasty; regional anesthesia; high-risk surgery; postoperative analgesia

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1. INTRODUCTION

Hip fractures in the elderly are becoming increasingly common, often associated with substantial morbidity and mortality due to the high prevalence of systemic comorbidities in this population. The choice of anesthetic technique must be carefully tailored to minimize hemodynamic disturbances while ensuring adequate surgical conditions and postoperative analgesia. While general anesthesia has traditionally been used, it carries increased risk in patients with respiratory compromise, diastolic dysfunction, or a

history of cardiovascular and neurological events. The combined spinal-epidural (CSE) approach offers the rapid onset of spinal anesthesia with the flexibility of epidural catheterization, allowing for intraoperative supplementation and postoperative pain control. In this case, we discuss the anesthetic management of an elderly woman with significant cardiopulmonary and neurologic comorbidities who underwent bipolar hemiarthroplasty using a low-dose CSE technique.

2. CASE REPORT

A 68-year-old female presented to our facility following a domestic fall that resulted in a right intertrochanteric fracture with an associated intracapsular neck of femur fracture. She was scheduled for bipolar hemiarthroplasty. Her medical history was significant for long-standing hypertension managed with amlodipine, coronary artery disease with angioplasty performed ten years prior, and she had GOLD stage II chronic obstructive pulmonary disease (FEV1 62%).[2]], managed with intermittent home nebulization (Duolin and Budesonide), and was not on long-term oxygen therapy. She also had type 2 diabetes mellitus controlled with oral hypoglycemic agents and a history of cerebrovascular accident one year prior, with no residual motor or sensory deficits. She was maintained on aspirin 75 mg and rosuvastatin 10 mg as part of secondary prevention for both her cardiovascular and cerebrovascular conditions.

On preoperative evaluation, her oxygen saturation was noted to be 92% on 3 L/min oxygen via nasal prongs. Hemoglobin was 9.2 g/dL. A chest X-ray showed cardiomegaly with increased bronchovascular markings. Electrocardiography revealed a normal sinus rhythm. Echocardiography showed a normal EF (~60%), mild concentric LVH, and grade 1 diastolic dysfunction.[3] The patient was nebulized with Duolin Respules (salbutamol and ipratropium) and Budesonide preoperatively to optimize her pulmonary status. After multidisciplinary discussion and obtaining informed high-risk consent, we opted for a combined spinal-epidural technique to ensure both hemodynamic stability and postoperative analgesia.

The procedure was performed under full aseptic precautions in the sitting position at the L3–L4 interspace using an 18G Tuohy needle. Through the same needle, a 25G Quincke spinal needle was introduced, and 2 mL of 0.5% hyperbaric bupivacaine combined with 0.5 mL (25 µg) of fentanyl was administered intrathecally. An epidural catheter was then threaded and fixed at 10 cm from the skin. A sensory level of T10 was achieved. The surgery lasted approximately 90 minutes, and the patient remained hemodynamically stable throughout without the need for vasopressor support.

Postoperatively, she was shifted to a high-dependency unit. Analgesia was provided via the epidural catheter using 0.125% bupivacaine 8 mL every 6 hours. Her pain was well controlled with VAS $\leq$ 3/10, and no rescue analgesia was required. Oxygen saturation remained stable, and no respiratory complications occurred. She was mobilized with physiotherapy on postoperative day two and discharged in stable condition.

3. DISCUSSION

Anesthesia for elderly patients with multiple comorbidities requires individualized planning to minimize risks. Our patient presented with high-risk features, including COPD, ischemic heart disease, diastolic dysfunction, and a previous stroke. While older literature favored regional anesthesia to avoid systemic effects, recent trials such as ROGAIN have shown comparable safety profiles for GA and spinal techniques.[1] However, for this patient, a regional approach was chosen to avoid the risks of airway instrumentation and potential postoperative pulmonary complications.[4]

The use of a standard-dose spinal anesthetic with fentanyl allowed for effective anesthesia while limiting hemodynamic instability. Fentanyl does not reduce the required local anesthetic dose but enhances block quality and duration.[2] Grade 1 diastolic dysfunction, while generally not requiring management changes, was considered in avoiding hypotension.[3] The epidural catheter provided effective postoperative analgesia and flexibility for supplemental dosing, although no boluses were required intraoperatively.

Importantly, the preoperative use of bronchodilators likely optimized lung function.[5,6] The absence of desaturation or respiratory distress postoperatively supports the suitability of the regional technique in such patients. Objective pain scoring and structured analgesia with no rescue drug requirement further support the adequacy of the block.

4. CONCLUSION

A carefully selected and executed combined spinal-epidural technique provided safe and effective anesthesia in this elderly, high-risk patient undergoing hip surgery. Standard-dose spinal anesthesia supplemented with intrathecal fentanyl and postoperative epidural analgesia ensured intraoperative stability and excellent recovery. Regional anesthesia continues to be a valuable option in multimorbid geriatric patients when guided by clinical judgement and current evidence.

5. Conflict of interest

All authors declare that there was no conflict of interest.

6. Funding

The study utilized the hospital resources only, and no external or industry funding was involved.

7. Authors' contribution

Both authors took part in the conduct of the study and manuscript editing.

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