

## Case Report

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# Anesthetic management of a 75-year-old patient with heart failure and reduced LVEF and diaphragmatic hernia: A perioperative dilemma during total hip arthroplasty

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## Abstract

Anesthetic management of elderly patients with heart failure and reduced left ventricular ejection fraction (LVEF) combined with diaphragmatic hernia represents a significant anesthetic challenge. We report the case of a 75-year-old patient undergoing total hip arthroplasty, in whom anesthetic choice was complex due to the risk of respiratory and hemodynamic failure. We discuss optimal anesthetic strategies in light of current literature.

**Keywords:** Anesthesia; Heart failure; Reduced LVEF; Diaphragmatic hernia; Total hip arthroplasty.

## Introduction

Anesthesia in elderly patients with cardiovascular and pulmonary comorbidities poses a significant clinical challenge. Heart failure with reduced LVEF is associated with increased perioperative morbidity and mortality due to risks of hemodynamic decompensation and ventricular dysfunction. Furthermore, diaphragmatic hernia can impair ventilatory mechanics and lead to intraoperative hypoxemia. This case highlights the complexity of anesthetic decision-making in a multimorbid patient undergoing major orthopedic surgery.

## Methodology

This is a clinical case collected in March 2025 in the central operating room of CHU Ibn Rochd, Casablanca. Data were gathered from the patient's medical records, anesthetic and surgical reports, and perioperative follow-up. A literature review was conducted to compare our management with current guidelines.

## Results

The patient, aged 75, semi-autonomous, initially presented following a closed trauma of the left hip due to a fall from standing height. His medical history included treated heart disease (no documents available), orthopedic treatment of bilateral ankle fractures, and a diaphragmatic hernia.

### Preoperative evaluation

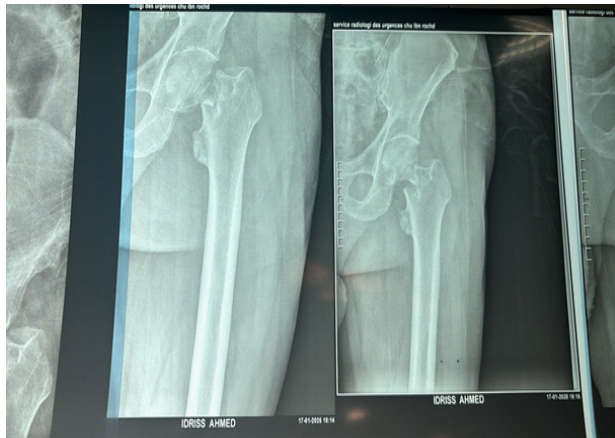
- Clinical examination: Patient conscious (Glasgow 15/15), hemodynamically and respiratorily stable. Complete functional impairment of the left lower limb with abduction and external rotation posture. No sensory deficit, pressure ulcers, or signs of deep vein thrombosis.
- Radiological assessment: True Garden 4 cervical fracture.
- Chest CT scan: Left posterolateral Bochdalek-type diaphragmatic hernia without notable complications.

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- Echocardiography: Poor echogenicity, LVEF at 25%, thin inferior vena cava, no pericardial effusion.
- ECG: Supraventricular tachycardia with atrial fibrillation at 166 bpm.
- Chronic treatment: Cardensiel, Lasilix, Cordarone, and aspirin.
- Other considerations: No difficult intubation criteria, palpable non-arthritic spine, good venous access.



**Figure 1:** Anteroposterior hip X-ray showing a hip fracture.



**Figure 2:** X-ray of the hip and femur showing a stage 4 hip fracture.

#### Perioperative management

- Monitoring: ECG, SpO<sub>2</sub>, blood glucose, temperature.
- Placement of an arterial line and a central venous catheter.
- Anesthetic technique: Spinal anesthesia with fractionated injections of bupivacaine.
  1. Initial injection of 10 ml (a mixture of pure bupivacaine and saline), followed by 5 ml every 30 minutes.
  2. Preventive administration of norepinephrine by intravenous infusion pump before the first injection (0.5 mg/h).
  3. No need for intravenous sedation.
- Procedure: Total hip arthroplasty.

- Intraoperative course: Hemodynamic stability with no episodes of significant hypotension.

#### Postoperative course

- Monitoring in the intensive care unit.
- Gradual weaning off norepinephrine.
- ECG returned to normal; troponin kinetics normal over 24 hours.
- Pain score (VAS): 2/10.
- Early mobilization and transfer to the trauma unit the following day.

#### Discussion

In this high cardiovascular and respiratory risk patient, spinal anesthesia was chosen to limit the hemodynamic impact of general anesthetics while avoiding intubation and mechanical ventilation, which could be harmful due to the diaphragmatic hernia. Literature reports that spinal anesthesia reduces myocardial stress and the risk of acute heart failure in this context [1,2]. However, spinal anesthesia can induce relative hypovolemia with a risk of severe hypotension, especially in patients with severely reduced LVEF. Prophylactic administration of norepinephrine was a relevant approach, supported by studies demonstrating its efficacy in preventing perioperative hemodynamic collapse [3,4]. Preoperative optimization through thorough cardiological evaluation and adaptation of medication is essential. The cautious use of beta-blockers and diuretics perioperatively remains a debated topic in the literature [5,6]. The involvement of a multidisciplinary team including anesthesiologists, cardiologists, and surgeons optimizes care and reduces postoperative morbidity and mortality [7,8].

#### Conclusion

This case illustrates the anesthetic challenges in managing an elderly patient with severe heart failure and diaphragmatic hernia undergoing major orthopedic surgery. An individualized strategy including regional anesthesia combined with preventive vasopressor support ensured safe management and rapid recovery.

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