

Perioperative Anesthesia Management for Hip Fracture Surgery in Elderly Patients on Antithrombotic Therapy

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ABSTRACT:

Hip fractures in elderly patients are a significant health concern due to their association with increased morbidity, mortality, and reduced quality of life. Early surgical management of patients suffering from hip fractures remains an important means to reduce mortality. Many of these patients are on antithrombotic therapy (anticoagulants or antiplatelets) for underlying comorbidities, posing challenges for perioperative anesthesia management. Discussions are ongoing regarding the optimal mode of anesthesia regional vs general, with regional having a slight upper hand over general. Ideally, specific time intervals which vary according the type and dose of agents and renal function, related to the administration of antithrombotic drugs both prior to and after neuraxial procedures should be observed. Drug assays may be used to guide individual time intervals. A thorough preoperative assessment including patient history, assessment of underlying comorbidity, laboratory investigations, and assessment of bleeding risk, is important. Interdisciplinary collaboration among anesthesiologists, surgeons, and other specialists is essential for optimal outcomes. In high risk patients, the reversal of antithrombotic agents may be considered taking into consideration of the risk of thrombosis. Where interrupting antithrombotic therapy poses a greater risk, a shorter antithrombotic-free interval may be preferred and deviating from guidelines after multidisciplinary discussion and individual risk-benefit analysis may be considered.

Keywords: Hip fracture surgery, elderly, antithrombotic therapy, general anesthesia, regional anesthesia, early surgery

INTRODUCTION:

Hip fractures, particularly proximal femoral fractures, are a growing global concern, with an estimated incidence of seven million by 2050 due to rising life expectancy and lifestyle changes (2). These cause considerable morbidity and mortality and have a significant impact on quality of life and are accompanied by distinct perioperative issues. Early surgical intervention ideally within 24–48 hours is crucial in minimizing complications such as infection, pneumonia, VTE, and delayed rehabilitation (3). Roughly 30–40% of these patients, however, are on antithrombotic therapy for cardiovascular or cerebrovascular diseases and thus become a challenge in anesthesia planning, particularly if a plan involving regional anesthesia is being considered(3). This paper examines the anesthesia challenges in this population, focusing on the choice between general and regional anesthesia, management of

antithrombotic therapy, and strategies to minimize complications such as spinal hematoma.

EPIDEMIOLOGY AND TIMELY SURGICAL INTERVENTION:

The high prevalence of hip fracture among the elderly is largely due to osteoporosis and age-associated decline in balance, vision, and mobility which increases the risk of fall. Osteoporotic bones, particularly in the proximal femur, are prone to fracture even after minor trauma. Hormonal changes associated with aging contribute to reduced bone remodeling and delayed healing. Timely surgery is essential, as delays beyond 48 hours are associated with increased mortality and poorer functional recovery. Prompt surgical fixation enables earlier mobilization, improves respiratory function, and reduces hospital-acquired complications.

ANESTHETIC CONSIDERATIONS AND TECHNIQUE SELECTION:

The choice of anesthesia for hip fracture surgery in elderly patients significantly influences intraoperative safety and postoperative recovery. General anesthesia (GA) may increase respiratory and cardiovascular risks in this population. In elderly patients with limited physiological reserve, GA is also associated with a higher incidence of intraoperative hypotension and postoperative sedation, which can contribute to complications such as cognitive decline. GA is typically chosen in multimorbid patients and when neuraxial anesthesia is contraindicated for example, in the presence of coagulopathy (e.g., thrombocytopenia, ongoing anticoagulation), severe aortic stenosis, local or systemic infection, or spinal anatomical abnormalities such as scoliosis or prior spine surgery. Conversely, regional anesthesia particularly spinal anesthesia—avoids systemic sedation and preserves spontaneous respiration. It also facilitates earlier

postoperative recovery by reducing opioid requirements and minimizing the risk of respiratory depression. The choice between GA and spinal anesthesia should be individualized, taking into account comorbidities, surgical urgency, medication history, and the experience of the anesthesia team.

COMPARATIVE OUTCOMES OF ANESTHETIC TECHNIQUES

A comparison of GA and neuraxial anesthesia is presented in Table 1. Spinal anesthesia has been associated with reduced intraoperative blood loss, fewer pulmonary complications, and a lower incidence of postoperative delirium. Although short-term outcomes such as improved pain control and shorter hospital stays often favor regional techniques, studies have not demonstrated significant differences in long-term cognitive outcomes between general and spinal anesthesia.

Aspect	General Anesthesia	Regional Anesthesia
Pulmonary Complications	Higher risk	Reduced risk
Cardiovascular Complications	Increased risk	Lower incidence
Blood Loss/Transfusions	Higher	Lower
Pain Control	Opioid-dependent	Better analgesia
Cognitive Outcomes	Comparable	Comparable

Table 1: Comparison of General and Regional Anesthesia for Hip Fracture Surgery

A critical concern in patients on antithrombotic therapy undergoing spinal anesthesia is the risk of spinal hematoma a rare but potentially devastating complication. This risk is heightened by traumatic needle placement, coagulopathy, or inadequate timing of anticoagulant discontinuation. Clinical signs such as new-onset back pain, motor weakness, or bladder and bowel dysfunction require urgent imaging and neurosurgical evaluation. Prevention hinges on strict adherence to published guidelines regarding drug discontinuation intervals and consideration of renal function.

DISCUSSION:

Managing elderly patients on antithrombotic therapy who require hip fracture surgery involves a delicate balance between minimizing bleeding risks particularly spinal hematoma and preventing thrombotic events such as myocardial infarction and pulmonary embolism. This review highlights key considerations for optimizing perioperative anesthesia care in this vulnerable population. Current evidence supports a slight preference for regional anesthesia, particularly spinal anesthesia, when

clinically appropriate. Its benefits include reduced pulmonary complications, superior pain control, and lower short-term mortality. However, general anesthesia remains a valid and necessary alternative in select patients, especially those with contraindications to neuraxial techniques. The safe use of regional anesthesia in patients on antithrombotics hinges on strict adherence to guideline-recommended drug discontinuation intervals and individualized assessment of bleeding versus thrombotic risk. Clinical decision-making must be tailored, weighing the urgency of surgery against the pharmacodynamics of the antithrombotic agent and patient comorbidities. Timely surgical intervention remains a cornerstone of optimal management, as delays are associated with increased morbidity and mortality. In many cases, early surgery can still be achieved despite ongoing antithrombotic therapy through proactive planning and interdisciplinary collaboration. Adjunct techniques, such as peripheral nerve blocks, may further enhance analgesia, reduce opioid consumption, and lower the incidence of postoperative delirium. Collaborative decision-making involving

anesthesiologists, orthopedic surgeons, hematologists, and geriatricians is essential. Incorporating patient values and preferences into care planning ensures a shared understanding of goals and risks, contributing to more personalized and effective perioperative management.

CONCLUSION:

Perioperative anesthesia management for elderly patients with hip fractures on antithrombotic therapy requires careful balancing of bleeding and thrombotic risks while prioritizing timely surgical care. Regional anesthesia particularly spinal anesthesia is generally preferred due to its favorable safety profile and benefits for postoperative recovery. However, individualized decision-making and guideline-directed antithrombotic management are critical to avoid complications such as spinal hematoma. Early interdisciplinary coordination is key to facilitating safe and timely surgery, even in anticoagulated patients.

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