Special Anesthetic Consideration for the Patient with a Fragility Fracture

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KEYWORDS

• Fragility fractures • Regional anesthesia • Epidural anesthesia
• Orthopedic fractures • General anesthesia • Elderly

KEY POINTS

- Preoperative workup considerations include evaluation of associated injuries as well as comorbidities commonly found in the elderly population.
- Anesthesia options include general and regional anesthesia.
- Regional anesthesia offers the advantage of effectively anesthetizing the surgical site and avoiding some of the cardiovascular, respiratory, and cerebral physiologic alterations associated with general anesthesia.
- Regional anesthesia offers the benefit of intraoperative anesthesia, with the ability to provide analgesia into the postoperative period.

INTRODUCTION

Fragility fractures are defined by the World Health Organization as fractures caused by injury that would be insufficient to fracture a normal bone.[1] Clinically, they have been described as a low-energy fracture that occurs from minimal trauma such as a fall from a standing height or lower.[2–5] With the aging of the population, fragility fractures are becoming more common. See the article on Epidemiology of Fragility Fractures by Friedman and Mendelson elsewhere in this issue for more detailed information.

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This article focuses on special anesthesia management for fragility fractures of the extremities and hip. Vertebral fractures are common but are to be discussed with special anesthesia considerations related to spine surgery, which are beyond the scope of this article.

Initial Workup Considerations

Several principles should be kept in mind when assessing anesthetic risk in an elderly patient with a fragility fracture. A major priority is to evaluate for associated injuries to ensure that no injury takes precedence over the fracture repair.

Dementia, depression, hearing difficulties, and stroke all may interfere with the ability to make independent decisions and obtain informed consent in frail elderly patients. If a patient's ability to make decisions becomes severely impaired, then a surrogate must give consent. Advance directives, when available, can be helpful. Neurologic, pulmonary, and cardiac morbidities are the most common types of postoperative complications in the elderly, and the anesthesiologist should pay attention to these specific organ systems.

Risk Stratification

Preoperative pulmonary risk stratification

In general, what the anesthesiologist wants to know about the patient's preoperative pulmonary status is their risk for respiratory failure, pulmonary complications like pneumonia or aspiration, and difficulty in ventilator weaning or need for care in the intensive care unit. Certain physiologic parameters help predict the likelihood of postoperative pulmonary complications (**Box 1**).

Risk of hypoxia may be shown by room air saturation less than 90% or may be associated with low preoperative hemoglobin levels, although the exact level of hemoglobin at which this risk increases is controversial. Risk of postoperative CO_2 retention may be predicted by pulmonary function test, if available. Parameters such as preoperative FEV_1 (forced expiratory volume in first second of expiration) less than 50% of predicted or forced vital capacity of less than 1.7 L are associated with a higher likelihood of CO_2 retention.[6]

Preoperative cardiac risk stratification

The information of importance to the anesthesiologist when the patient has had a fall concerns whether the fall is secondary to cardiac cause. If the patient has a pacemaker, does it work? Are they in heart failure? Are they having an acute coronary syndrome? Excellent guidelines are available. The reader is referred to Figure 1 in the American College of Cardiology/American Heart Association Task Force 2007

Box 1
Physiologic parameters that help predict postoperative pulmonary complications

Predictor of pulmonary complications
Room air O_2 saturation less than 90%
Low hemoglobin levels
FEV_1 less than 50% predicted
FVC <1.7 L

Abbreviations: FEV_1, forced expiratory volume at 1 second; FVC, forced vital capacity.