Optimizing Perioperative Care for Patients with Hip Fracture

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KEYWORDS

• Hip fracture • Perioperative care • Optimization • Algorithm

KEY POINTS

- Hip fracture surgery is semi-urgent in nature, and is associated with significant morbidity and mortality in comparison with elective hip surgery.
- Hip fracture surgery should be performed within 24 to 48 hours after admission.
- Institutional guidelines are recommended to improve efficiency.
- The focus of preoperative preparation is risk assessment, stratification, and management to achieve effective and efficient optimization within 48 hours or sooner.
- The optimization process should extend throughout the whole perioperative period.

THE CHALLENGES

Hip fracture is one of the most common orthopedic conditions associated with significant morbidity and mortality. It is estimated that there were 1.66 million hip fractures worldwide in 1990, projected to be more than 6 million by the year 2050.[1]

Hip fracture surgery is usually defined as intermediate-risk procedure. However, patients with hip fracture are usually older with significant comorbidities, which place them in a much higher risk category with regard to perioperative morbidity and mortality.[2–4]

Although hip fracture surgery is a semi-urgent procedure by nature, delayed surgical treatment could cause a downward spiral with a poor outcome. Meta-analysis on 257,367 patients indicated that operative delay beyond 48 hours after admission is associated with 41% higher 30-day all-cause mortality and 32% higher 1-year all-cause mortality.[5] It is thus generally recommended that patients with a hip fracture

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should undergo surgery as soon as possible once the patient's medical condition is optimized.[6] Hereby clinicians are presented with the challenge to optimize the complex patient within a short time period.

PREOPERATIVE RISK CONSIDERATION AND OPTIMIZATION

Cardiac Consideration in Patients with Hip Fracture and Risk Stratification

Cardiac risk for elective hip surgery is generally treated as intermediate risk, with a 30-day cardiac complication rate of 1% to 5%.[7] This estimation is based on an elective, relatively young and healthy patient population. However, patients with hip fracture are usually older, with significant cardiac and pulmonary comorbidities. Repair surgery for a hip fracture is also considered semi-urgent. Lawrence and colleagues[3] analyzed close to 9000 patients 60 years or older undergoing hip fracture surgery, and reported that 8% of patients had cardiac complications postoperatively. The 30-day and 1-year mortality was 4% and 16%, respectively.

Nonetheless, the benefit of hip fracture surgery usually outweighs the perioperative risks. The goal is to optimize the patient's cardiac condition within a short period of time. The American College of Cardiology (ACC) and the American Heart Association (AHA) have published a stepwise approach for cardiac assessment preoperatively in noncardiac patients.[7,8] The stepwise approach is helpful in determining the readiness for surgery and identifying the necessity of further medical management. The ACC/AHA guidelines consist of 7 steps with consideration of the emergency nature of the surgery, active cardiac condition, surgical risk, functional capacity of the patient, and clinical risk factor stratification when the previous steps are unable to lead to a favorable decision.[7,8]

There are several characteristic features of hip fractures. First, they are usually considered semi-urgent procedures, except the open hip fracture, which would be considered emergent. Second, patients with hip fracture are usually older, with substantial comorbidities and limited baseline functional capacity. A complete history and physical examination should be performed on all patients, while understanding that this is challenging for patients with mental status changes either at baseline or due to the acute event. Sometimes additional tests may be indicated, thus delaying the timing of surgery.

In consideration of these specific features, the authors propose a modified algorithm to guide the management of patients with hip fracture (**Fig. 1**).

Step 1. The physician should determine the emergent/urgent nature of the surgery. Complete history and physical examination should be performed. All necessary treatment should be initiated to maximally resuscitate and stabilize patients with regard to acute blood loss, fluid deficiency, coexisting injuries, and so forth.

Step 2. Does the patient have active cardiac conditions? There are 4 groups of active cardiac conditions that warrant further investigation: unstable coronary syndromes, decompensated heart failure defined as New York Heart Association functional class IV, worsening or new-onset heart failure, significant arrhythmia, and severe valvular disease.[7,9] Patients with 1 or more of these active cardiac conditions may require further evaluation and treatment. Hospitalists and cardiologists can be helpful in optimizing patients in a timely manner and should be consulted as needed. The goal of consultation is to determine the severity of the medical condition and identify any potentially modifiable factors for improvement. Even though some of the desired treatments might not achieve maximum benefit preoperatively, their continuation throughout the perioperative period should target the best positive outcome for those patients with hip fracture.