

Reducing mortality and morbidity following hip fracture: Is expedited surgery the way to go?

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Hip fractures secondary to osteoporosis are considered to be the most debilitating type of fragility fracture.¹ Although comprising 14% of osteoporotic fractures, hip fractures account for 72% of fracture-related costs.² In Canada, half of nearly 60 000 hospital admissions for osteoporosis-related fractures in fiscal year 2007/08 were for hip fractures.³ The one-year mortality following a hip fracture is estimated to be 14%–36%,⁴ and 30% of survivors do not achieve their pre-injury level of functioning.⁵

Ensuring early surgical intervention has been proposed as a way to mitigate these negative outcomes. There is increasing consensus that earlier time to surgery (traditionally defined as ≤ 48 h after admission) is associated with less severe morbidity (e.g., infections and pressure sores), lower pain, decreased lengths of stay and reduced mortality.⁶ National orthopedic associations in Canada, the United States and the United Kingdom, for instance, mandate a time of less than 48 hours from diagnosis to surgery for all hip fractures. Despite conflicting evidence to support this approach,⁶ some are suggesting even shorter times to surgery.

In part because of the rising prevalence of hip fractures in aging Western populations, and the substantial morbidity associated with them, some advocates are now calling for surgical intervention within 12 hours, and even within 6 hours, after hospital admission.⁷ In June 2015, the Ontario SPOR (Strategy for Patient-Oriented Research) SUPPORT Unit committed \$1.8 million to the study of expedited (< 6 h) hip fracture care (ossu.ca/impact-awards/impact-award-devereaux/).

The benefit of a shorter time from event to therapeutic intervention has been shown consistently to save lives in acute myocardial infarction, pulmonary embolism and ischemic stroke. In these conditions, early intervention brings the advantage of potentially reversing the disease pathology (whether fracture or vascular occlusion) and restoring more normal physiologic processes, including limiting the inflammatory or stress response.

In a recent analysis of registry data, Nyholm and colleagues⁸ reported 30- and 90-day mortality among more than 3500 patients with hip fractures stratified by time to surgery (≤ 12 h, 12–24 h, 24–36 h, 36–48 h, 48–72 h and > 72 h). They found that mortality generally increased with increasing time to surgery, from 7.8% at 30 days among patients with the shortest time to 10.8% among those with the longest time, and from 15.2% to 17.4%, respectively, at 90 days. The authors concluded that rapid surgical treatment of hip fracture should be the standard. Data from the 2014 Hip Fracture Accelerated Surgical Treatment and Care Track (HIP ATTACK) pilot randomized controlled trial suggested that expedited surgical care within six hours after hospital admission may confer further benefit of improved outcomes.⁷

After re-examining the mortality data presented by Nyholm and colleagues,⁸ we noted that the 30-day survival among patients who had surgery 36 hours or more after hospital admission was 88% and the 90-day survival 82%, which means that most of the patients survived. This raises the question: Do *all* patients require expedited surgical intervention?

Patient- and injury-related characteristics between younger and older patients with hip fracture, for example, can differ, the suggested treatment often differs (fixation v. replacement), and the expected outcomes of surgery differ.⁹ Differences in outcomes also have been reported depending on patients' residence status. Patients with hip fracture admitted to hospital from the community have been found to have better short- and long-term outcomes compared with those admitted from long-term care facilities.¹⁰

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KEY POINTS

- Hip fractures are associated with substantial morbidity and mortality.
- Current standards recommend surgical intervention within 48 hours after hospital admission to mitigate these negative outcomes.
- Earlier surgery, even within six hours after admission, is currently being advocated following new evidence published in the last two years; however, further consideration is warranted before such an approach is adopted for all hip fractures.

We caution that further consideration is warranted before expedited surgery for *all* hip fractures is widely adopted. We doubt that delivering surgical intervention for all patients with hip fracture within six hours after admission will be feasible, either in the current clinical reality of limited health care resources and pressures to minimize costs, or in the near future with the number of such fractures expected to increase. The shorter the time from admission to intervention, the greater the resource and personnel demands, which may often require delaying or cancelling scheduled elective procedures. The investigators of the HIP ATTACK pilot trial reported that they were able to coordinate medical and surgical teams swiftly, shifting daytime elective surgeries as needed, to facilitate faster access to operating room facilities.⁷ Despite their resource-intensive protocol, only 50% of the patients randomly assigned to the accelerated care group (15/30) had surgery within the mandated six hours. With further analysis and results to come, we hope their unique data set will permit an investigation of the subgroup(s) of patients at highest risk of morbidity and death, for whom expedited surgical intervention will prove most effective.

Expedited surgery within six hours after hospital admission for frail patients may affect the opportunity to optimize their medical conditions before surgery (e.g., intravascular volume resuscitation) and may have implications for incremental postoperative care needs, for example.¹¹ Concurrent with experiencing fracture-related blood loss, frail patients can be malnourished, dehydrated and taking medications that promote hypotension and diuresis. Adequate intravascular volume resuscitation before surgery, and the subsequent avoidance of intraoperative and postoperative hypotension,¹² may limit the risk of cardiac-related complications and delirium. On the other hand, expedited surgery may prove most beneficial for patients who are medically stable and have prefracture functional limitations (patient-reported limitations in instrumental activities of daily living).

The aim of reducing morbidity and mortality following hip fracture is laudable, ethical and necessary. However, we caution that hospital admission for hip fracture should not be the only trigger for expedited surgery. Rather, it seems more prudent to identify the group(s) at greatest risk of poor outcomes following delayed surgery and target expedited intervention to them.

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