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BRIEF ANSWERS TO SPECIFIC CLINICAL QUESTIONS

Q: Do hip fractures need to be repaired within 24 hours of injury?

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No randomized prospective study has compared early vs delayed hip surgery

A: There is considerable debate about the optimal timing of hip fracture repair and whether delaying it affects outcomes. Postoperative rates of medical complications and death are high, for many reasons.

Patients who are medically stable (ie, who do not have hypovolemia, accelerated hypertension, untreated infection, or a symptomatic arrhythmia) and have preserved cardiopulmonary function should proceed to operative repair as soon as practically possible.

However, many patients wait more than 24 hours after admission to the hospital until their medical conditions are optimized prior to surgery or until a surgeon or operating room becomes available. If the patient's medical condition is unstable, then operative repair should be delayed until the patient is at his or her healthiest possible baseline level.

How long can surgery be delayed? Available evidence suggests that waiting up to 72 hours to allow time to stabilize any existing medical conditions does not adversely affect health or functional outcomes in patients with hip fracture. Further study is needed to identify specific groups of patients who would benefit from operative delay for medical stabilization.

HIP FRACTURES ARE NOT ALL THE SAME

The term "hip fracture" refers to a fracture of the proximal femur, be it in the femoral neck, across the trochanters, or below the trochanters.

Femoral neck fractures (especially if displaced) may compromise the blood supply to the femoral head and increase the risk for avascular necrosis and nonunion.[1] Earlier operation is preferred for optimal technical results if the femoral head is to be preserved. Intertrochanteric and subtrochanteric fractures occur in well-vascularized areas and pose less risk of osteonecrosis.

There are several options for surgical repair.[1] Internal fixation with multiple screws can be used for minimally displaced femoral neck fractures; a sliding hip screw may be used for intertrochanteric fractures. Prosthetic replacement of the femoral head is done if significant displacement occurs. However, compared with internal fixation, this procedure carries a higher operative risk from blood loss and anesthesia time.

WHY OPERATE IMMEDIATELY?

Many experts advocate repairing hip fractures expeditiously—within 8 to 24 hours from admission to the hospital.

In published series, patients who underwent surgery earlier had lower rates of nonunion,[2] avascular necrosis of the femoral head,[3] urinary tract infections,[4] decubitus ulcers,[5,6] pneumonia, venous thromboembolism,[7] and death,[7–9] and better long-term functional status[7] than did those who underwent surgery later.

In addition, delaying surgery prolongs the patient's pain and suffering. In a recent prospective cohort study of 1,206 patients, those who underwent surgery within 24 hours had significantly fewer days of severe and very severe pain and shorter lengths of hospital stay.[10] Higher pain ratings in patients with hip fracture are associated with longer postoperative lengths of stay, delayed postoperative rehabilitation,[11] and increased risk of delirium,[12] which increases mortality and complications in elderly hospitalized patients.[13]

However, the evidence in this area is flawed by the heterogeneity and retrospective design of the studies. To date, no randomized prospective study has compared delayed surgery with expeditious surgery, so it is difficult to know whether surgical delay adversely affects outcomes directly, or whether delay in surgery is simply a reflection of underlying morbidities that adversely affect outcomes.

WHY DELAY REPAIR?

The main reason to delay surgery is to optimize the patient's medical conditions.

Many patients with hip fractures have preexisting chronic diseases such as diabetes, congestive heart failure, coronary artery disease, or anemia. These conditions produce neuropathy, visual impairment, or weakness, which may have contributed to the fall and hip fracture.

In addition, an elderly patient who is found on the floor at home with a fractured hip may have been there a long time without access to food or water, predisposing him or her to dehydration, electrolyte disturbances, and rhabdomyolysis with renal failure. Any of these conditions, if not assessed, treated, or stabilized preoperatively, may lead to perioperative complications such as myocardial ischemia and infarction, delirium, and nutritional compromise.

These complications increase in-hospital and overall mortality and also lead to a delay in weight-bearing and rehabilitation.[5,14] Therefore, a delay in surgical intervention of 24 to 48 hours after admission is advocated to correct metabolic disturbances and to optimize chronic medical conditions, which may improve overall outcomes.

In contrast to prior studies noting increased mortality with operative delay, recent studies noted no significant difference in mortality rates after immediate hip fracture repair vs delayed repair after controlling for the severity of medical conditions.[5,15–17]

In a retrospective analysis of 406 patients with proximal femoral fractures, Kenzora et al[18] noted a higher 1-year mortality rate after operative repair on the first hospital day compared with the second through fifth hospital days (34% vs 5.8%, $P \leq .00001$); this difference remained significant in the subgroup with three or fewer medical problems. No explanations for delays in surgery were given, but the authors postulated that physiologic changes induced by a fractured hip, such as immobilization, dehydration, and other metabolic disturbances, coupled with the stress of surgery itself, contributed to the increased mortality with early repair.

Harries and Eastwood[19] noted no difference in short-term outcome if surgery was delayed to optimize the patient's medical condition.

Zagrodnick and Kaufner[20] noted a lower in-hospital mortality rate (18.9% vs 9.1%) with preoperative stabilization of medical conditions.

The largest study to date regarding the timing of surgery was done by Grimes et al,[6] who retrospectively evaluated 8,383 patients with hip fractures operatively repaired between 1983 and 1993. Delaying surgery more than 24 hours from admission was associated with a higher long-term mortality rate in unadjusted analyses compared with prompt surgery (ie, < 24 hours from admission). However, when adjusted for demographic variables and for severity of underlying medical problems, no significant association was found. Mortality at 30 days and postoperative morbidity measures were similar, although those who underwent delayed surgery had twice the risk of developing decubitus ulcers.

A patient found on the floor at home may have been there a long time

PREOPERATIVE STRESS TESTING VS BETA-BLOCKER THERAPY

Delaying hip fracture repair for noninvasive cardiac testing is controversial.

For example, imagine a patient has an uncomplicated intertrochanteric fracture and diabetes that requires insulin but has no prior congestive heart failure or cardiovascular disease. The consultant orders a dipyridamole-thallium test, which reveals anterior wall ischemia. The patient then undergoes catheterization, angioplasty, and stent placement in the left anterior descending coronary artery. He is now committed to 4 weeks of aspirin and clopidogrel therapy, and after these agents are stopped another week is needed before the bleeding risk is acceptable.

Surgery has now been delayed 5 to 6 weeks, during which time the patient has limited mobility, becomes deconditioned, and is at increased risk of venous thromboembolism. In addition, operative repair may now be more technically difficult.

Alternately, empiric beta-blocker therapy has been shown to significantly reduce perioperative cardiac complications, independent of stress test results, in lower-risk patients. Boersma et al[21] evaluated 1,097 patients who underwent dobutamine stress echocardiography before major vascular surgery; 360 of these patients received beta-blockers. Patients receiving beta-blockers who had fewer than three risk factors from the Lee risk index (high-risk surgery, ischemic heart disease, congestive heart failure, cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine concentration > 2.0 mg/dL) had a very low risk of cardiac complications (0.8%). Dobutamine stress echocardiography had minimal additional prognostic value in these patients.

Hip fracture repair poses a lower risk than major vascular procedures for perioperative cardiac complications. Empiric beta-blocker therapy in lower-risk patients confers significant cardiac protection that allows expeditious repair of a fractured hip, avoids unnecessary testing, and minimizes complications related to operative delay.

Beta-blockers reduce perioperative cardiac complications independent of stress test results

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