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EVIDENCE-BASED ORTHOPAEDICS

In Patients with Hip Fracture, Accelerated Surgery within 6 Hours Did Not Differ from Standard Care for Mortality or Major Complications

HIP ATTACK Investigators. Accelerated surgery versus standard care in hip fracture (HIP ATTACK): an international, randomised, controlled trial. *Lancet*. 2020;395(10225):698-708.

Question: In patients with hip fracture, what are the effects of accelerated surgery compared with standard care on mortality and major complications?

Design: Randomized (allocation concealed), blinded (outcome assessors), controlled trial with 90 days of follow-up.

Setting: 69 hospitals in 17 countries.

Patients: 2,970 patients \geq 45 years of age (mean age, 79 years; 69% women) who had a low-energy-mechanism hip fracture diagnosed during regular working hours that required surgery. Exclusion criteria included treatment with a therapeutic dose of an anticoagulant without a reversing drug, previous heparin-induced thrombocytopenia and

treatment with a therapeutic dose of a vitamin K antagonist, periprosthetic or open fracture, bilateral fracture, or need for emergency surgery for another reason. 99.5% of patients completed follow-up.

Intervention: Patients were allocated to accelerated surgery, ideally within 6 hours of diagnosis, facilitated by expedited clinical assessment for medical clearance and priority access to the next available orthopaedic or trauma operating room slot ($n = 1,487$), or standard care ($n = 1,483$).

Main outcome measures: The co-primary outcomes were mortality and major complications (composite of mortality or non-fatal myocardial infarction, stroke, venous thromboembolism, sepsis, pneumonia,

life-threatening bleeding, or major bleeding) at 90 days. Secondary outcomes included delirium within 7 days. 3,000 patients were required to detect a hazard ratio (HR) of 0.70 for mortality, assuming a 13% mortality rate in the standard care group (88% power, 2-sided $\alpha = 0.04$) and an HR of 0.70 for major complications, assuming 45% overlap between the co-primary outcomes and a 30% complication rate in the standard care group (99% power, 2-sided $\alpha = 0.015$).

Main results: Median time between diagnosis and surgery was 6 hours in the accelerated group and 24 hours in the usual care group (median absolute difference, 18 hours; 95% confidence interval [CI], 17 to 19). 52% of fractures were intertrochanteric and 44% were femoral neck fractures. Open reduction and internal fixation was done in 63% of patients, and arthroplasty, in 35%. Groups did not differ for mortality or complications at 90 days; delirium within 7 days was reduced in the accelerated surgery group (Table I).

Conclusion: In patients with hip fracture requiring surgery, accelerated surgery within 6 hours did not differ from standard care for mortality or major complications at 90 days.

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TABLE I Accelerated surgery versus standard care in patients with hip fracture requiring surgery*

Outcomes	Event rates at 90 days		Event rates at 7 days		RRR (95% CI)	NNT (95% CI)
	Accelerated surgery	Standard care	Accelerated surgery	Standard care		
Mortality	9%	10%			9% (-13% to 27%)	Not significant
Major complications [†]	22%	22%			3% (-11% to 15%)	Not significant
Delirium			9%	12%	26% (7% to 39%)	34 (22 to 119)

*RRR = relative risk reduction, CI = confidence interval, and NNT = number needed to treat. RRR, NNT, and CI calculated from control event rates and hazard ratios or odds ratio in article. [†]Composite of mortality or non-fatal myocardial infarction, stroke, venous thromboembolism, sepsis, pneumonia, life-threatening bleeding, or major bleeding.

Commentary

In hip fractures, as with many injuries, we know that earlier care is better; the current standard is treatment within 48 hours. The HIP ATTACK Investigators have admirably pursued a question many of us have pondered: If faster is better, is even faster even better? Although the results indicate that treating patients with an accelerated protocol (generally within 6 hours) did not reduce mortality or major complications, there are positive findings worth noting. Patients in the accelerated group were able to mobilize and, subsequently, be discharged more quickly, and they had lower rates of delirium and urinary tract infection. These outcomes are beneficial to patients (potentially increasing patient satisfaction and patient-reported outcome scores) and our modern, value-based health-care systems.

The authors note that each center will have to weigh the costs of implementing an accelerated pathway against the potential benefits. In most centers, operating room availability and medical clearance are the biggest barriers to getting patients with hip fracture into the operating room in a timely fashion. I look forward to the publication of the economic analysis by the HIP ATTACK Investigators to help bolster these conversations.

On a final note, the authors focused on enrolling patients during business hours only. Trauma happens 24 hours a day, and future studies evaluating an accelerated

program that is implemented at all hours would be beneficial. Previous studies have shown that hip fractures can be safely managed during off hours, including weekends¹⁻³, but dedicated orthopaedic-specific resources, including operating room staff, radiology technicians, and implants—as well as the orthopaedic surgeon—must be immediately available to truly have quality care available at all hours.

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