Geri-Ortho Co-Care

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Academic Collaborative Conference

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OBJECTIVES

- The Significant Burden of Hip Fractures
- Hip Fracture Management
  - Peri-Operative management
  - Co-Management Model
  - Post-Operative management
- Transitions of Care
- Hip Fracture: Best Care Practices

CASE STUDY

Mrs. M, 80 year old female with atrial fibrillation (on warfarin), HTN and mild dementia

Presents to the Emergency Department with severe right hip pain after a ground level fall in her home

Diagnosed with a right femoral neck fracture

Hip Fractures: A Significant Burden

- Approximately 330,000 hip fractures occur yearly in the United States
- Mortality rate: 20%-24% in 1 year
- Many patients will lose their independence after hip fracture
- A woman's risk of dying from a hip fracture is high and *exceeds the life-time risk of death from breast cancer, uterine cancer, and ovarian cancer combined*.

Hip Fractures: A Significant Burden

- The cost of caring for hip fractures was reported to be $17 billion in 1997, and it is estimated that it will grow to $62 billion by 2040
- In 2005, the average cost for inpatient care of a hip fracture was $33,962
- The average length of hospital stay for a hip fracture in 2006 was 6.3 days

Fragility fracture

- Definition: low-energy injuries that occur from a fall from a standing or lower height
- Lifetime risk of having a fragility fracture after 50 years old: 33% for an American woman and 20% for an American man
- In the United States, 2.1 million people will suffer a fragility fracture each year.
- Incidence of fragility fractures increases steeply after age 65
- Osteoporosis is present in most patients with a fragility fracture

Fragility Fracture: A Major Risk for Future Fracture

Of patients with 1 fragility fracture:

- 10% will have another within 1 year
- 17% to 21% will have another within 2 years

Osteoporosis

FRAX (available at www.sheffield.ac.uk/FRAX)

Patients with a 10-year hip fracture risk of 3% or a 20% risk of major osteoporotic fracture should be treated for osteoporosis

Bone Health Program

Hip Fracture Management

- Co-management model
- Preoperative Evaluation
- Timing of Surgery
- Warfarin Reversal
- Venous Thromboembolism (VTE) Prophylaxis
- Post-operative care

Co-management Model

- Orthopedics
- Anesthesia
- Geriatrics
- Hospitalist
- Nursing
- Physical therapy

Management Goal: Early Surgical Repair

- Coordination and cooperation among teams
- Minimize unnecessary preoperative tests and consultations,
- Any test that is ordered should have a clear and immediate benefit to the patient.
- Evaluation or procedures that are not needed for a surgical decision should be avoided.

Common Comorbidities associated with patient presenting with hip fractures

- Coagulopathy: INR>1.6
- Respiratory failure
- Heart failure
- Electrolyte abnormalities
- Sepsis
- UTI
- Pneumonia

Goal: to ensure patient is medically optimized

Cardiac Clearance!!!

ACTIVE CARDIAC CONDITIONS

Patients require evaluation and treatment before nonurgent, noncardiac surgery (Class I, Level of Evidence B)[52]

Condition	Examples
Unstable coronary syndromes	• Unstable or severe angina (Canadian Cardiovascular Society class III or IV) • Recent MI (≤30 days)
Decompensated heart failure	• New York Heart Association functional class IV • Worsening or new-onset heart failure
Significant arrhythmias	• High-grade A-V block • Mobitz II A-V block • Third-degree A-V heart block • Symptomatic ventricular arrhythmias • Supraventricular arrhythmias (including atrial fibrillation) with uncontrolled ventricular rate (HR >100 bpm at rest) • Symptomatic bradycardia • Newly recognized ventricular tachycardia
Severe valvular disease	• Severe aortic stenosis (mean pressure gradient >40 mmHg, aortic valve area <1 cm^2, or symptomatic) • Symptomatic mitral stenosis (progressive dyspnea on exertion, exertion presyncope, or heart failure)

Reprinted from *Journal of the American College of Cardiology*, Vol 54(22), Fleischmann KE, Beckman JA, Buller CE, et al., 2009 ACCF/AHA Focused Update on Perioperative Beta Blockade, p2102-2128, 2009, with permission from Elsevier.

Timing of Surgery

Meta-analysis of 16 observational studies on surgical timing and mortality

- N = 257,367 patients
- Patients without active comorbid illness

Outcomes:

- Delay in surgery >48 hours associated with:
- Increased mortality at 30 days by 41%
- Increased mortality at 1 year by 32%

Shiga, Can J Anaesth 2008

Issues with delayed surgery

- Delayed functional recovery
- Complications of prolonged bedrest
- Pain
- Increased costs
- Increased mortality

Balance with need to stabilize coexisting medical conditions

Warfarin, Coagulopathy, and Warfarin Reversal

- ~6-11% with therapeutic anticoagulation levels causing surgical delay
- Usually due to Warfarin
- Most surgeons prefer INR < 1.5
    - Vitamin K commonly used to reverse anticoagulation
    - Initial effects in 4-6 hours
    - Peak action 24-36 hours
    - Can decrease surgical delay by 44 hours without increasing complications
    - Vitamin K Advisory
    - For prompt reversal: fresh frozen plasma or prothrombin complex concentrates

Leonidou, J Ortho Surg 2013

Venous Thromboembolism (VTE) Prophylaxis

- DVT 50-80%, PE 10-20%, fatal 5-7%
- 40% reduction in VTE with either warfarin, UF heparin, LMWH heparin or fondaparinux
- All patients should have intermittent pneumatic leg compression

Handoll, Cochrane Database 2002 Cohen, J Bone Joint Surg Br 2007

VTE Prophylaxis: Timing and Duration

Timing:

- Chest 2012 guidelines: suggests LMWH either 12 hr pre-op or 12 hr post-op

Duration:

- Chest 2012 guidelines: consider extending prophylaxis up to 35 days, rather than 10-14 days
- AHRQ 2012 (Agency for Healthcare Research and Quality) guidelines: prolonged prophylaxis >21 days compared to 7-10 days decreased risk for VTE for THA patients but increased minor bleeding

Sobieraj, Ann Int Med 2012 Falck-Ytter, Chest 2012

Delirium Delirium Delirium

DIAGNOSING DELIRIUM: THE CONFUSION ASSESSMENT METHOD – SHORT FORM		
Feature	**Question**	**Answer Required**
Acute onset and fluctuating course	Is there evidence of an acute change in mental status from baseline, and if so, did it tend to come and go or increase and decrease in severity?	'Yes' answer
Inattention	Did the patient have difficulty focusing attention?	'Yes' answer
Disorganized thinking	Was the patient's thinking disorganized or incoherent?	'Yes' answer
Altered level of consciousness	What is the patient's level of consciousness? (alert, vigilant, lethargic, stupor, or coma)	Any answer other than alert
Scoring: Suggestion of diagnosis requires the presence of (1) and (2) and either (3) or (4)		
Adapted from Inouye SK, van Dyck CH, Alessi CA, et al, Clarifying confusion: the confusion assessment method. A new method for detection> of delirium. *Ann Intern Med* 1990;113(12):941-8.		

DELIRIUM PREVENTION STRATEGIES[99,108]

- Education targeted to health care professionals about delirium
- Multicomponent, multidisciplinary nonpharmacologic interventions which may include:
    - Daily physical activity
    - Cognitive reorientation
    - Bedside presence of a family member whenever possible
    - Sleep enhancement (for example, nonpharmacologic sleep protocol and sleep hygiene)
    - Early mobility and/or physical rehabilitation
    - Adaptations for visual and hearing impairment
    - Nutrition and fluid repletion
    - Pain management
    - Appropriate medication usage
    - Adequate oxygenation
    - Prevention of constipation
    - Minimization of patient tethers whenever possible (for example, Foley catheters, periodic removal of sequential compression devices, EKG cords)

Adapted from Clinical Practice Guidelines for Postoperative Delirium in Older Adults, *J Am Geriatr Soc*, 2014.

TREATING DELIRIUM[99,108]		
Patient	**First Line Therapy**	
All delirious elderly patients	Multicomponent nonpharmacologic interventions	1. Frequent reorientation with voice, calendars and clocks 2. Calm environment 3. Eliminating restraint use 4. Familiar objects in the room 5. Ensuring use of assistive devices (glasses, hearing aids)
	Second Line Therapy	
Agitated, delirious elderly patients threatening substantial harm to self and/or others, if behavioral measures have failed or are not feasible	Antipsychotic medications at lowest effective dose	1. Haloperidol starting at 0.5-1 mg PO/IM/IV (IV route not recommended due to increased risk of prolonged QT interval) Reevaluate in 15 min-1 hr and double dose if ineffective Increased risk of prolonged QT interval when dose exceeds 35 mg per day 2. The following can also be used: a. Risperidone b. Olanzapine c. Quetiapine d. Ziprasidone
Adapted from Clinical Practice Guidelines for Postoperative Delirium in Older Adults, *J Am Geriatr Soc*, 2014.		

Hip Fracture: Best Care Practices

- Correct major clinical abnormalities
- Early surgery < 72 hours
- Regional anesthesia may reduce risk of delirium
- VTE prophylaxis
- Antibiotic prophylaxis: infection risk reduction 60%
- Pressure ulcer prevention measures
- Scheduled pain medications/protocol
- Delirium prevention
- Transfusion to maintain Hb 8 g/dL
- Early ambulation
- Nutrition supplementation
- Bisphosphonates and fall prevention

Hung, JAMA

References

Management of the Elderly Orthopedic Patient: Lisa Miura, MD Joseph Schenck, MD, OHSU/VA

A Guide to Improving the Care of Patients With Fragility Fractures
Geriatric Orthopaedic Surgery & Rehabilitation 2011 2: 5

ACS NSQIP AGS Best Practice Guidelines: Optimal Perioperative Management of the Geriatric Patient