Updated: 7/17/2020

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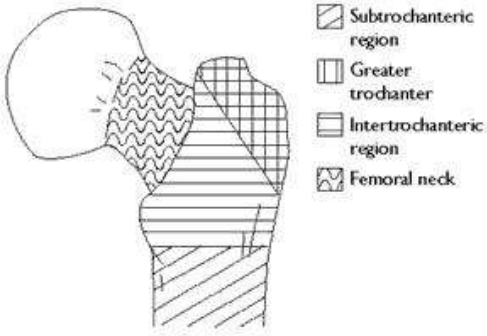
Intertrochanteric Fractures

Mark Karadsheh

TOPIC	QUESTIONS	EVIDENCE	VIDEOS	CASES	TECHNIQUES
Review Topic	27 /27	36 /36	11 /11	41 /41	2



Introduction

- Extracapsular fractures of the proximal femur between the greater and lesser trochanters
- Epidemiology
  - incidence
    - roughly the same as femoral neck fractures
  - demographics
    - female:male ratio between 2:1 and 8:1
    - typically older age than patients with femoral neck fractures
  - risk factors
    - proximal humerus fractures increase risk of hip fracture for 1 year
- Pathophysiology
  - mechanism
    - elderly
      - low energy falls in osteoporotic patients
    - young
      - high energy trauma
- Prognosis
  - nonunion and malunion rates are low
  - 20-30% mortality risk in the first year following fracture
  - factors that increase mortality
    - male gender (25-30% mortality) vs female (20% mortality)
    - higher in intertrochanteric fracture (vs femoral neck fracture)
    - operative delay of >2 days
    - age >85 years
    - 2 or more pre-existing medical conditions
    - ASA classification (ASA III and IV increases mortality)

Anatomy

- Osteology
  - intertrochanteric area exists between greater and lesser trochanters
  - made of dense trabecular bone
  - calcar femorale
    - vertical wall of dense bone that extends from posteromedial aspect of femoral shaft to posterior portion of femoral neck
    - helps determine stable versus unstable fracture patterns

Classification

- Stability of fracture pattern is arguably the most reliable method of classification
  - stable
    - definition
      - intact posteromedial cortex
    - clinical significance
      - will resist medial compressive loads once reduced
  - unstable
    - definition
      - comminution of the posteromedial cortex
      - thinner lateral wall thickness
        - measured from 3 cm distal from innominate tubercle at 135 degrees to the fracture site
          - <20.5 mm suggests risk of postoperative lateral wall fracture
            - should be treated with intramedullary implant rather than sliding hip screw
    - clinical significance
      - fracture will collapse into varus and retroversion when loaded
    - examples
      - fractures with a large posteromedial fragment
        - i.e., lesser trochanter is displaced
      - subtrochanteric extension
      - reverse obliquity
        - oblique fracture line extending from medial cortex both laterally and distally

Presentation

- Physical Exam
  - painful, shortened, externally rotated lower extremity

Imaging

- Radiographs
  - recommended views

- useful if radiographs are negative but physical exam consistent with fracture
- MRI useful to evaluate intertrochanteric extension with isolated greater trochanteric fracture patterns

Treatment

- Nonoperative
  - **nonweightbearing with early out of bed to chair**
    - indications
      - nonambulatory patients
      - patients at high risk for perioperative mortality
    - outcomes
      - high rates of pneumonia, urinary tract infections, decubiti, and DVT
- Operative
  - **sliding hip compression screw**
    - indications
      - stable intertrochanteric fractures
    - outcomes
      - equal outcomes when compared to intramedullary hip screws for stable fracture patterns
  - **intramedullary hip screw (cephalomedullary nail)**
    - indications
      - stable fracture patterns
      - unstable fracture patterns
      - reverse obliquity fractures
        - 56% failure when treated with sliding hip screw
      - subtrochanteric extension
      - lack of integrity of femoral wall
        - associated with increased displacement and collapse when treated with sliding hip screw
        - increased risk of lateral wall fracture with decreasing lateral wall thickness
    - outcomes
      - equivalent outcomes to sliding hip screw for stable fracture patterns
      - use has significantly increased in last decade
  - **arthroplasty**
    - indications
      - severely comminuted fractures
      - preexisting symptomatic degenerative arthritis
      - osteoporotic bone that is unlikely to hold internal fixation
      - salvage for failed internal fixation

Techniques

- **Sliding hip compression screw**

- pros
  - allows dynamic interfragmentary compression
  - low cost
  - no violation of hip abductors
- cons
  - open technique
  - increased blood loss
  - not advisable in unstable fracture patterns
    - may result in
      - collapse
      - limb shortening
      - medialization of shaft
  - can cause anterior spike malreduction in left-sided, unstable fractures due to screw torque

- **Intramedullary hip screw**
  - technique
    - short implants with optional distal locking
      - standard obliquity fractures
    - long implants
      - standard obliquity fractures
      - reverse obliquity fractures
      - subtrochanteric extension
  - pros
    - percutaneous approach
    - minimal blood loss
    - may be used in unstable fracture patterns
  - cons
    - periprosthetic fracture
    - higher cost than sliding hip screw
    - requires violation of hip abductors for insertion
- **Arthroplasty**
  - technique
    - calcar-replacing prosthesis often needed
    - must attempt fixation of greater trochanter to shaft
  - pros
    - possible earlier return for full weight bearing
  - cons
    - increased blood loss
    - may require prosthesis that some surgeons are unfamiliar with

Complications

- Implant failure and cutout
  - incidence
    - most common complication

- young
  - **corrective osteotomy and/or revision open reduction and internal fixation**
- elderly
  - total hip arthroplasty

- Anterior perforation of the distal femur
  - incidence
    - can occur following intramedullary screw fixation
  - cause
    - mismatch of the radius of curvature of the femur (shorter) and implant (longer)
    - posterior starting point on the greater trochanter
- Nonunion
  - incidence
    - <2%
  - treatment
    - revision ORIF with bone grafting
    - proximal femoral replacement
- Malunion
  - incidence
    - varus and rotational deformities are common
  - treatment
    - corrective osteotomies

TECHNIQUE GUIDES (2)

Technique Guide

Intertrochanteric Fracture ORIF with Cephalomedullary Nail

Orthobullets Team

Trauma - Intertrochanteric Fractures

QUESTIONS (27)

QUESTIONS 8 of 27 Previous Next

(OBQ16.168) A 67-year-old female falls and sustains the injuries shown in figures A and B. The decision is made to treat her with a trochanteric entry nail. Intraoperative fluoroscopy is seen in figure C. When attempting to remove the guide wire, there is a mechanical block, impeding its extraction. What should be performed next? Review Topic | Tested Concept
QID: 8930

FIGURES: A B C

1. Insert wire for lag screw
2. Remove the nail and re-ream canal
3. Remove the nail to re-assess fracture reduction
4. Remove the nail and guide wire
5. Remove the jig

Select Answer to see Preferred Response

EVIDENCES (101)

evidenceFootprint

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VIDEOS (11)

All Videos (11) Podcasts (2)

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2018 Orthopaedic Summit Evolving Techniques

77-Year-Old Status Post Intermedullary Nail For An IT Hip Fracture, Now Needing A Total Hip

8/12/2019

303 views

Simon Mears

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Pro: Read The Literature: The IM Nail, It Is The Right Answer - Get Them Up Out Of Bed Today - David B. Weiss, MD (OSET 2018)

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David B. Weiss

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Question Session | Intertrochanteric Fractures & Legg-Calve-Perthes Disease

11/11/2019

40 plays

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Trauma | Intertrochanteric Fractures

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393 plays

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CASES (41)

Intertrochanteric hip fracture (C101532)

7/19/2020

Spencer Schulte

17

7

Trauma - Intertrochanteric Fractures

Periprosthetic Femur Fracture in 82F (C101402)

Shaun Patel

Trauma - Intertrochanteric Fractures

E

3/22/2020

431

7

2

2019 Orthopaedic Trauma & Fracture Care: Pushing the Envelope

1/16/2019

Intertrochanteric Fx in 26M (C101154)

Harmeeth Uppal

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3

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