Intertrochanteric Hip Fractures – Tips and Tricks

Trauma 101
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I have no potential conflicts with this presentation
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Objectives
• Describe fracture patterns as stable or unstable
• Understand fracture anatomy and its contributions to fracture stability
• Review the current literature on treatment of unstable fractures
• Tips and Tricks related to the above
Incidence

- 150,000/yr. currently
- 250,000/yr. by 2040
- 90% > 65 yrs. of age
- 50 - 60% unstable and increasing

Classification

- Many existing classification schemes
  - Stable
  - Unstable
    - More common
      - With age
      - With bone density
OTA Classification

Disruption/ comminution of medial buttress
Trochanteric comminution
Reverse obliquity
Subtrochanteric extension
Transverse
IS THIS FRACTURE STABLE?

A. YES
B. NO
C. DON'T KNOW

TREATMENT OPTIONS

A. Sliding Hip Screw
B. Intramedullary Hip Screw
C. Prosthetic Replacement
D. Other
CRITIQUE FIXATION

A. Looks Great

B. Ok. Will probably get away with it

C. What were they thinking?

SLIDING HIP SCREW

• Overall excellent results in stable fractures

• Tip apex distance

• 5%-25% failure rate (screw cutout) particularly in unstable fracture patterns

Tip #1: Tip-Apex Distance
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Applies to Nails as well?

Sliding hip screws are designed to collapse. 
The device worked perfectly. But is this 
acceptable and/or preventable?
Tip #2 – RECOGNIZE UNSTABLE FRACTURES

• Unstable
  – Posteromedial comminution with loss of lesser trochanteric buttress
    • “3 part” - some judgement
    • “4 part” - no thinking required

SHORTENING/COLLAPSE CAN BE PROBLEMATIC

• Limb shortened, abductor tension shortened

• 15 mm sliding associated with failure and pain in unstable fractures

Jacobs, Rha, Steinberg, Baixauli

Tip #2 – RECOGNIZE UNSTABLE FRACTURES

• Large or comminuted posteromedial cortex

• Loss of the lateral cortical wall

• Reverse oblique or transverse fracture pattern

• Intertrochanteric with subtrochanteric extension
Lateral femoral wall is defined anatomically as the lateral femoral cortex distal to the vastus ridge.
Tip #3 -TREATMENT OPTION FOR UNSTABLE FX IN OR

• Trochanteric buttress plate
Why change to IM Device?

- IM Device Theoretical Advantages

1. Implant more central, smaller bending moment, effectively stronger
2. Implant may provide buttress to resist shortening
3. Less hardware irritation?
4. Less surgical trauma?
   - Less blood loss/transfusion
   - Improved healing
5. Shorter operative and fluoroscopy times?
INTRAMEDULLARY HIP SCREW

• Designed for insertion through greater trochanter
• Valgus offset of proximal nail
• Can be statically locked
• Percutaneous

• Biomechanically superior to screw and sideplate
• Shorter moment arm
• Decreased tensile strain on implant may lead to decreased failure rates

SHS VERSUS CM Nail????

• Length of surgery, blood loss, technical complications, union rate, revision surgery, fracture deformity, limb surgery, pain mobility, living situation, mortality

• Given lower complication rates, SHS is superior for IT fixation. More studies needed to determine if IM nail superior for unstable fractures types

Cochrane Library, Parker and Handoll (*11/01)
Tip #4 - Cost

CHS ~ $600 - $800

IM Device ~ $1500 - $2500

Reverse oblique intertrochanteric fracture
Tip #5 – Recognize Reverse Obliquity Fractures

- “high subtroch”
- “reverse obliquity”
- AO/OTA 31-A3
  – good evidence to suggest superiority of IM implant!!!!!!

Kregor, et al., JOT, January 2005

Unstable Pourochanteric Femoral Fractures
- failure rates with CHS too high for recommended use
  (evidence-based literature review)
**Reverse Obliquity Fractures**

- 95° fixed angle devices performed significantly better than SHS for reverse obliquity fractures
- Results worse for fracture with poor reduction and poorly placed implant

Haidukewych (2001)

**REVERSE OBLIQUE FRACTURES**

- IM Nail shorter operative time, less blood loss and shorter hospital stay

Sadowski (2002)
Tip #6 - Fracture Reduction

- Neck / Shaft Axial Alignment
- Translational Displacement
- Anatomic Reduction of Individual Fragments Not Necessary

• Reduction Maneuver
  - Traction
  - Internal Rotation

Posterior Sag

- Typically NOT a problem in stable fracture pattern

- External device
- Internal device

Tip #7 - Intra-Operative Positioning and Starting Point

- Scissors Position
  - un-Injured limb
    - Extended Hip
    - Femoral nerve palsy
Intra-Operative Positioning

• Hemilithotomy Position
  – un-injured limb
  • Hip Flexed
  • Abducted
  • Knee Flexed
• Difficult in some pts

Intra-Operative Positioning

• Abducted and Extended Position
  – un-injured limb
  • Hip Abducted
  • Knee extended

Intra-Operative Positioning

• Scissors Position
  – un-injured limb
  • Extended Hip
  • Femoral nerve palsy

Pillows for support
Tip #8 - Position of Starting Pin

Beware Posterior Sag and Varus

2 Part - Looks Straightforward
Tip #9 – Check Tip in Long Nail

- Beware of nail curvature
  - Distal tip may penetrate anterior cortex
Tip #10 - Use of Bone Hook

Healed Fracture

Tip #11 – Open the Fracture! Use Clamps
Clamps and Starting Point

Tip #12 – Cerclage Wires

If Done well are Safe and will allow for healing!
Tip # 13 – Basicervical Fractures

Rods MAY work BUT Recommend Side Plate!

Basicervical Fracture - Pins
Basicervical Fixation – Side Plate!

Summary
1. Reduce Fracture – whatever it takes (pins, clamps, bone hooks, Ball spike pushers, cerclage wires)
2. Remember TAD
3. Stable versus Unstable to select implant
4. Cost may play a role at your institution?
5. Starting Point KEY to success AVOID VARUS!
6. The set up will make life easier supine or lateral
7. Long Nails check distally

My Choice
- Stable
  - chs (2 hole side plate)
  - Consider variable angle
    - $ inventory
    - intra-op ability to adjust
My Choice

• Unstable
  – Im device
• Helps decrease shortening
• Short if no shaft extension
  – Distal locking screws
  – Beware anterior cortex cutout

Thank you