


Semi-Extended Tibial Nailing
Zach Working, MD

November 02, 2018 Oregon Association of Orthopaedic Surgeons Annual Meeting


I have nothing to disclose



2

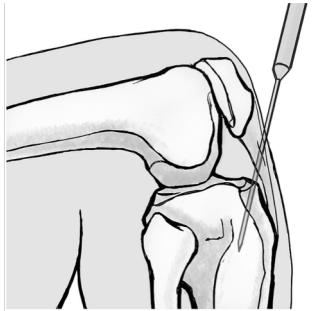
Overview: Semi-extended tibial nailing

- Why?
- How?
- Approaches
- Technical pearls



3

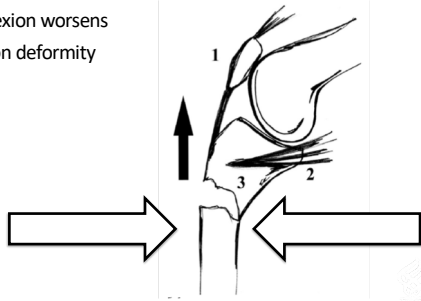
Why Hyperflexion?



4

Why Semi-extended: Proximal third

- Hyperflexion worsens extension deformity



5

What does the evidence say?

- | Hyperflexion | Semi-extended |
|--|---|
| <ul style="list-style-type: none">• Past reports show up to 59% malalignment• Nork et al. JOT 2006 3% malalignment > 5 degrees | <ul style="list-style-type: none">• Tornetta, CORR 2006<ul style="list-style-type: none">- 23/25 acceptable alignment• Ryan, Steen, Tornetta JOT 2014<ul style="list-style-type: none">- no malalignment in 50 consecutive cases |
- Few direct comparisons
 - Small, expert series

6

Why Semi-extended: Imaging

- Orthogonal imaging straightforward
- No need to change positioning
- Ease of start site, interlocking



7

Why Semi-extended: Reduction

- Simplifies application of reduction aids
 - Percutaneous clamps
 - Traveling traction or distractor
 - Blocking (Poller) Screws



8

Semi-extended: (Relative) Indications



- Proximal third tibial shaft fractures
- Distal fractures
 - Difficult reduction
 - Intra-articular extension
- Limited help!

9

Technique: Positioning



10

Technique: Approach

- Three main options
 - Medial parapatellar
 - Suprapatellar nailing
 - Lateral parapatellar extra-articular

11

Medial parapatellar

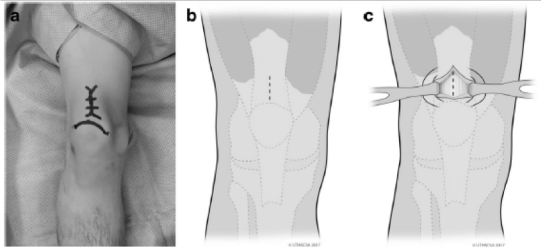


- Medial arthrotomy
- Either
 1. Large incision with patellar eversion
 2. Limited incision with special instrumentation

Ryan, Steen, Tornetta JOT 2014

12

Suprapatellar nailing

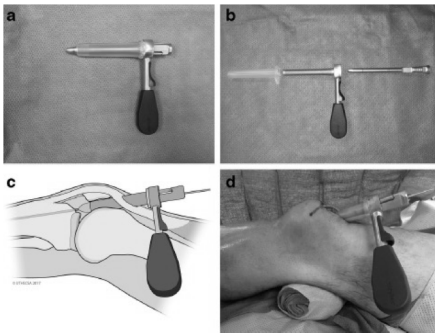


13

Zelle, SICOT J, 2017



Suprapatellar technique



14

Zelle, SICOT J, 2017



Why not suprapatellar?

1. Concerns patellofemoral contact pressures
2. Intra-articular reamings
3. Difficult if limited patellar mobility
4. Contaminated open fractures?
 - Maracek et al. showed 2 knee infections with suprapatellar vs. none with infrapatellar (Not significant)

15



International Journal of Surgery 51 (2016) 133–139

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.elsevier.com/locate/ijso

ELSEVIER

Review

Suprapatellar versus infrapatellar approach for tibia intramedullary nailing: A meta-analysis

Cong Wang¹, Erman Chen¹, Chenyi Ye, Zhijun Pan^{*}

Department of Orthopedics, Second Affiliated Hospital, School of Medicine, Zhejiang University, 310000, Hangzhou, People's Republic of China

- Meta-analysis of 2 RCT's, 6 retrospective cohort studies
- Shorter fluoro time, improved alignment, lower pain scores with suprapatellar nailing

16

A Comparison Of The Open Semi-Extended Parapatellar Versus Standard Entry Tibial Nailing Techniques and Knee Pain: A Randomized Controlled Trial

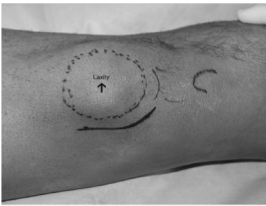
Rothberg/Haller/Higgins/Kubiak – JOT 2018 ahead of print

- 1 yr follow up with IKDC scores: 24 SEK vs 23 FK
- 6 SEK and 7 FK lost to follow up
- No difference in symptom scores
- Trend towards worse pain specific scoring with FK

17

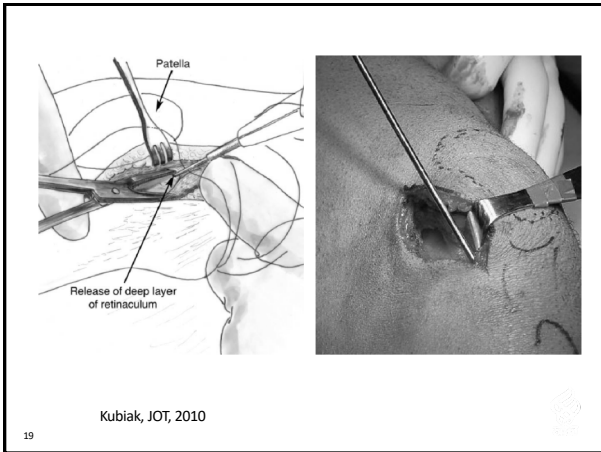
Lateral parapatellar extra-articular

- Avoids entering the joint (usually)
- No special instrumentation
- Requires mobile patella and/or more extensive lateral release



Kubiak, JOT, 2010

18



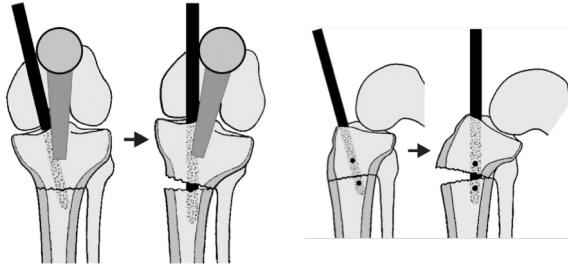
Why not parapatellar

- May end up intra-articular
- Zamora et al. Injury 2016 – Cadaver Study
 - 30% lateral parapatellar intra-articular
 - 10% (1/10) damage to cartilage vs 20% (2/10) with suprapatellar
 - Less important location

20



Start site can be challenging



22 Using the awl can be extremely helpful!!

My Approach by Fracture Location

- **Proximal third**
 - Semi-extended suprapatellar nailing
 - Optimal start site
 - possible posterior Poller screw
- **Middle third**
 - Infrapatellar vs lateral semi-extended

My Approach by Fracture Location

- **Distal third**
 - Semi-extended: Lateral vs suprapatellar
 - Start site less critical
 - Simpler maintenance of reduction
- **Distal Fifth – "Hero Nail"**
 - Semi-extended: Lateral
 - Use of exchange tube & second ball tip guide to maximize reaming distance
 - Not worth the hassle to use exchange tube through suprapatellar incision

65yo M – MVC - R closed tibia fx



25



26

3 months

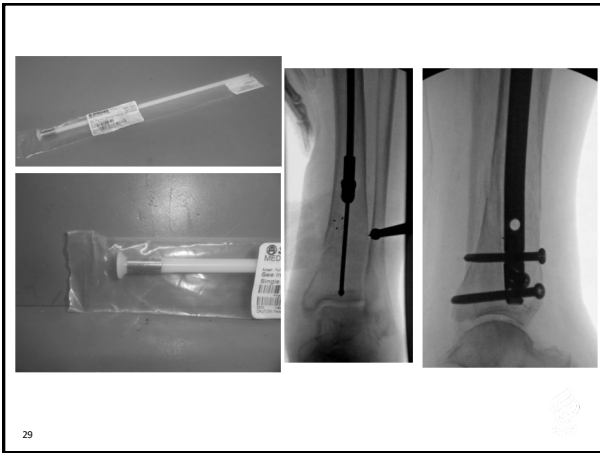


27

83 F – GLF - R closed tibia fx



28



29

Acknowledgements

- UCSF: David Shearer & Paul Toogood
- Utah: Dave Rothberg & Tom Higgins

30