Elizabeth A. Arendt, M.D.

I have no financial conflicts to disclose.
I am a consultant with Smith & Nephew.
Introduction:

• Distalization of the tibial tubercle (TT) is a common procedure to treat patella instability when patella alta is present.

• Close apposition of the distal TT to the anterior tibial shaft (TS) is ideal for timely bone healing.
Study Goals:

• to evaluate technical/demographic factors that could influence bone healing
• to document the average healing time of the distal TT-TS interface (defined as the gap)
• to evaluate frequency of bone resorption at the gap
• to determine if gap size is related to complications of tibia fracture/delayed union
Methods

• Cohort: patients with patella alta who underwent patella stabilization including MPFL reconstructions & distalization of TT

• Distal gap was measured on intra-operative fluoroscopy (initial bone gap) & followed on follow up sagittal radiographs.

• Bone resorption at the gap was defined as >2 mm increase between intra-operative & follow-up films (bone resorption gap).
Method: Measurements

Screw angle
1. First line through center of screw
2. Angle formed with vector down the center of the tibial shaft

Distal gap measurements
1. Space between osteotomy and distal tibia
2. Width of tibia at distal osteotomy site
Methods: Osteotomy Measurements

1. **Cortical length of osteotomy**

2. **Width of osteotomy** (measured at thickest width)

3. **Thickness of distal osteotomy**
Results:

- 74 females/25 males
- age (mean/range): 21 y.o. (13-45)
- BMI (mean/range): 26.1 (17-45)
- Smokers: 9 current smokers/88 non-smokers/2 unknown.
Results:

- 78% had X-rays that allowed assessment within 4 month; 68% had radiographic healing at the distal TT-TS

- Time to heal was not significantly correlated with sex, BMI or smoking status, though the smoking group was too small to make meaningful comparisons.
Results:

• Initial gap [mean (range)]: 1.52 mm (0-8.4); all but 2 patients <3.3mm gap

• If initial gap > 3mm, distalization distance ≥8mm

• 11 (11%) had an increase in their distal bony gap > 2mm (resorption gap range 2-7.8mm) w/out motion in tubercle screw fixation

• Thickness of the distal TT as a % of the total tibial width was 31% (range 22-37%)
Tibial Fracture after Distal TTO

- 4 tibial fractures: Fracture time from surgery (months): 1/2/5/6
- Initial gap: 1.51mm (0-8.4); all but 2 patients <3.3mm
- Gap resorption >3mm
  - 7 patients
  - 2 with tibia fracture
- mm of distalization: 9.8 mm (range 4mm to 15mm)
- The thickness of the distal TT (% of the total tibial width):
  - mean 31% (range 22-37%)
- Sex/ BMI / smoking: no correlation

= no correlation
Discussion

• Though there are many technical aspects of TT distalization, this large cohort could identify no demographic or surgical factors directly related to risk of tibia fracture or bone healing except gap resorption >3mm at TT-TS interface.

• Initial gap is associated with distalization distance.
Discussion

- At 4 months, 68% had radiographic healing

- 2/4 fractures happening after 2 months. This can be helpful in counseling our patients in anticipated post-operative recovery to pounding activities.

- Bone resorption at the distal TT-TS interface is recognized post-operatively (11%); it is not statistically correlated with timely healing, but may be a risk factor for tibial shaft fracture.
Gracias

Contact author: arend001@umn.edu