Serial CT evaluation for the reduction of the distal tibiofibular joint after open reduction and positional pinning in ankle injuries

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Our disclosure are in the Final AOFAS Mobile App.

We have no potential conflicts with this presentation.
Syndesmotic injury in ankle injuries

• Many syndesmoses were malreduced on CT scan but went undetected by plain radiographs.
  Gardner et al. “Malreduction of the tibiofibular syndesmosis in ankle fractures”.

• Axial CT imaging predict syndesmosis instability
  Yeung et al. “Can Pre-Operative Axial CT Imaging Predict Syndesmosis Instability in Patients Sustaining Ankle Fractures? Seven Years’ Experience in a Tertiary Trauma Center”.
“Firm” fixation: screw

- Process addition: “Drilling”
- Relatively firm
- Possible reduction loss during drilling and screw insertion

“Loose” fixation: K wire pinning

- Easy and Fast
- Easy change of direction
- Relatively loose
To investigate the reduction of the distal tibiofibular joint after open reduction and positional pinning with CT

K-wire fixation for syndesmotic injury

Good reduction?

Good staying power?

Interval change of syndesmotic joint?
Materials and methods

- February 2012 ~ June 2014
- 104 feet of 104 patients with mean age of 47.5 (range: 20 to 63)
- Indication: Rotational ankle fractures such as SER or PER type by Lauge-Hanssen classification
- Mean f/u: over 18 month (range: 12 to 30)
- SER: 64 feet
- PER: 40 feet
- AOFAS hindfoot score and visual analogue scale for pain
- CT evaluation of syndesmosis change
Syndesmotic reduction

- Anterolateral approach around syndesmosis and lateral malleolus
- Direct check of syndesmosis diastasis with the naked eye
- Check of Chaput tubercle avulsion
How to evaluate?

Axial CT images

(1) aTFD, mTFD, pTFD
(2) ATF

- At 10 mm proximal to the tibial plafond,
- anterior, middle, posterior shortest distances (aTFD, mTFD, pTFD) between fibula and tibia were measured
- compared with those of uninjured ankles
- preoperatively, immediate postoperatively and at the followup after removal of syndesmotic fixation.

ATF: anterior translation of fibula to tibia

The shortest distance from the anterior border of the fibula to the connecting line between most prominent point of anterior tibia and most prominent point of lateral fibula (ATF) were measured and compared in both ankles preoperatively, immediate postoperatively and at the followup after removal of syndesmotic fixation.
Results

- Mean preoperative aTFD, mTFD, pTFD were 3.4±0.5 mm, 6.2±2.4 mm, 10.3±2.9 mm respectively.
- Mean immediate aTFD, mTFD, pTFD were 1.4±0.3 mm, 2.9±0.5 mm, 5.1±2.0 mm respectively.
- Mean postoperative aTFD, mTFD, pTFD at the followup after pin removal were 2.4±0.5 mm, 3.6±1.0 mm, 6.3±2.9 mm respectively.
- Mean ATF were 0.5±0.1 postoperatively.
- Both aTFD and mTFD significantly improved immediate postoperatively and at the followup after removal of syndesmotic fixation.
- However mean pTFD was widened compared to uninjured ankle. All postoperative clinical outcomes were improved significantly.
pTFD widening but acceptable ATF: good clinical results
Conclusion

✓ Open reduction and positional pinning with anterolateral approach in rotational ankle injuries could show the good clinical outcomes and posterior tibiofibular diastasis could be allowed in terms of syndesmotic reduction if there is no anterior translation of fibula with improved anterior and middle tibiofibular distance at the axial CT images.
References


