Surgical Reduction of Anterior Talar Subluxation by Three Dimensional Ankle Mortise Stabilization Using Distal Tibial Oblique Oblique Osteotomy

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My disclosure is in the Final AOFAS Mobile App. I have no potential conflicts with this presentation.
**Distal Tibial Oblique Osteotomy (DTOO)**

- Developed by Teramoto et al. in 1980.
- Restoration joint stability to reduce ankle OA symptoms (C.f. the conventional low tibial osteotomy restores the overall joint alignment).
- Applicable to advanced (Stage IIIb or IV) ankle OA cases.
- Promising mid-term clinical outcome (Teramoto et al. 2005).
- Current hot topic in Japanese foot and ankle surgeons’ community.

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Medio-lateral laxity due to malleolar surface incongruity

Tightening the malleolar surface by valgus realignment

Note: Magnitude of valgus rotation is determined during surgery with fluoroscopic guidance (to seek the “best” congruency to stabilize the joint).
Anterior talar subluxation due to insufficient tibial coverage

Plantar flexion correction to improve anterior coverage

Theoretically, the effect of 3D ankle mortise stabilization includes reduction of anterior talar subluxation
Purpose

1. Determine the extent to which this procedure could correct anterior talar subluxation

2. Document the preliminary (short-term) clinical outcome
Methods

Subjects: 15 ankles
- 11F, 4M, 52-80 y/o
- OA stage: II (4 cases), IIIa (2), IIIb (7), IV (2)

Radiographic measurement
- Pre-OP, Post-OP
- A-P and lateral plain x-rays (standing)

Clinical outcomes
- JSSF scales (Niki et al. 2005)
Surgical Sequence

Arthroscopy

- Lateral bony spur removal

Open osteotomy

- Iliac bone grafting
- Locking plate fixation

Post-OP course: 1W~ ROM ex, 2W~ 1/2PWB, 4W~ FWB

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Valgus rotation: 15.6 ± 5.0°  
Plantar flexion: 6.8 ± 3.5°
Tibial axis-talar ratio = \( \frac{AD}{AB} \times 100 \)

**Results: Sagittal Reduction**

- Successful reduction in most (5/6) talar subluxation cases

(Dokkyo Medical University Koshigaya Hospital)

- Normative range: 27 – 42%
- Anterior subluxation
- Unsuccessful reduction
- Post-operative subluxation

(Tochigi et al. 2006)

☞ Successful reduction in most (5/6) talar subluxation cases
Results: Clinical Outcomes

JSSF ankle/hindfoot scale

53.5 ± 17.5  
85.6 ± 10.7

P < 0.05

Promising short-term (> 1 year) outcome

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Conclusion

☞ The hypothesized sagittal stabilization effect of the DTOO has been supported.
☞ This joint preservation surgery is a promising surgical option for advances ankle OA, as an effective alternative to joint replacement and fusion.

References