Surgical Treatment of Hyperpronation Using an Extra-Osseous TaloTarsal Stabilization Device: Radiographic Outcomes in Adult Patients

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Purpose

The purpose of this study was to determine radiographic correction of angular relationships between the hindfoot and forefoot osseous structures following an extra-osseous talotarsal stabilization procedure with ***HyProCure***® in patients diagnosed with reducible/partial dislocation of the talus on the tarsal mechanism (RTTD).

Background

Recurrent/reducible talotarsal dislocation (partial) is a dynamic deformity where the talus displaces on one or more of the articular facets of the tarsal mechanism. Radiographic evidence of this pathology includes an abnormally high talar second metatarsal angle (transverse plane) on weightbearing AP/DP radiographs and a higher than normal talar declination angle, obliterated sinus tarsi and navicular drop (sagittal plane) in lateral weightbearing radiographs. Therefore, treatment methods for RTTD should show restoration of the angular measurements to within accepted normals in order to prove their efficacy in correcting the pathology.

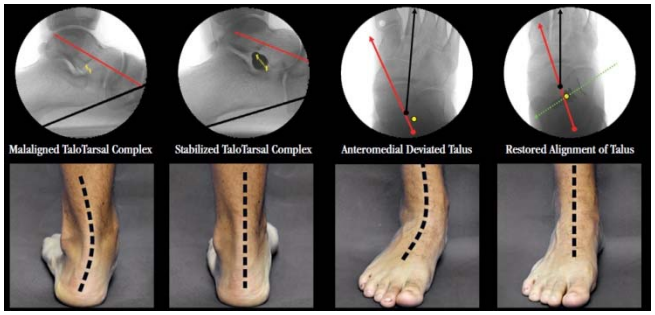
Patients & Methods

- 70 patients (95 feet) who were diagnosed with RTTD in at least one plane and underwent an EOTTS procedure with ***HyProCure***® as a stand-alone procedure.
- All 95 feet demonstrated a transverse plane deformity, while only 65 of the 95 feet showed evidence of the deformity in the sagittal plane.
- Mean age at the time of surgery was 58 (range 22 – 85 years).
- Angular correction was determined through a comparison of pre- and postoperative weightbearing radiographs.
- Postoperative radiographs were taken at an average follow-up period of 17 days.

HyProCure® was effective in normalizing T2M and TD angles, thus stabilizing the talotarsal mechanism in the transverse and sagittal planes.

Results

- Normalization of the talar second metatarsal angle on the AP view.
- Normalization of the talar declination angle on the sagittal view.
- No effect on the calcaneal inclination angle.
- Shows both transverse and sagittal plane correction/stabilization of the talotarsal mechanism and therefore also frontal plane correction.
- Findings: Talar 2nd Metatarsal Angle AP radiograph
  - Average pre-op T2M angle: 24.8 degrees
  - Average post-op T2M angle: 5.8 degrees
  - Mean decrease = 19 degrees (77%)
- Findings: Talar Declination Angle Lateral radiograph
  - Average pre-op TD angle: 25.1 degrees
  - Average post-op: 19.4 degrees
  - Mean decrease: 5.7 degrees (23%)
- No overcorrection was shown for feet with preoperative normal radiographic measurements in the sagittal plane.



Clinical Significance & Conclusions

- The results of the postoperative radiographic correction prove that transverse and sagittal plane normalization occurs. Since talotarsal motion is triplanar, correction of two of the three cardinal planes will result in triplane correction.
- EOTTS with ***HyProCure***® was effective in controlling motion in the desired planes without causing overcorrection or blocking in other planes.
- Stabilization of the TTM with ***HyProCure***® is effective in restoring the normal range of pronation and supination, which is essential for the reduction of strain and force on the soft tissues and osseous structures of the foot and ankle.