

Radiographic Evaluation of **Navicular Position** in the Sagittal Plane – Correction Following an Extra-Osseous TaloTarsal Stabilization Procedure

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Purpose

The focus of this study was to radiographically determine the effect of the **HyProCure**[®] extra-osseous talotarsal fixation device on navicular position. It was hypothesized that weightbearing navicular height would increase significantly following the placement of **HyProCure**[®] compared to the preoperative values due to stabilization of talotarsal dislocation.

Background

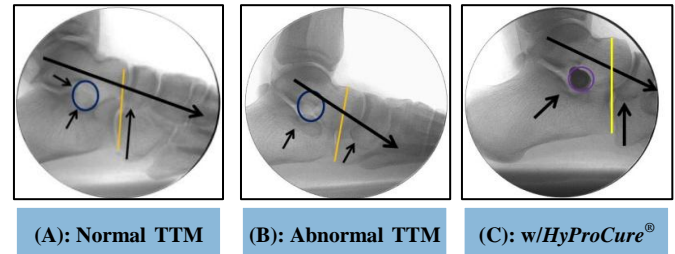
Anteromedial talar dislocation (partial) on the tarsal mechanism during weightbearing places excessive force anteromedially. As a result of the excessive, abnormal force, the navicular may compensate by “dropping”. Navicular drop leads to a loss of arch height and signifies a pathologic force acting on the medial column of the foot as well as its associated supporting structures such as the posterior tibial tendon, spring ligament, and the medial band of the plantar fascia. External measures have significant limitations in regards to maintaining navicular height.

Methods

- Radiographs were analyzed of 61 adult patients (86 feet) who underwent talotarsal fixation with **HyProCure**[®] without adjunctive hindfoot or midfoot soft tissue or osseous procedures.
- The distance of the navicular with respect to the cuboid was measured on the pre- and postoperative weightbearing lateral radiographs.
- Foot length was factored to normalize the navicular to cuboid distance.
- Postoperative radiographs were taken at an average follow-up of 17 days.

Talotarsal joint stabilization with **HyProCure[®] lead to an average 26% increase in navicular height.**

Lateral Weightbearing Radiographs: TaloTarsal Mechanism



Results

- The mean preoperative true navicular to cuboid distance was 19 ± 6 mm as compared to a mean postoperative value of 24 ± 5 mm.
- The mean pre- and postoperative normalized navicular to cuboid distances were 0.098 ± 0.029 and 0.125 ± 0.027 , respectively (± 1 SD).
- The postoperative increase in the true and normalized navicular to cuboid distance was statistically significant ($p < .001$).

Clinical Significance & Conclusions

- Not all patients with anteromedial dislocation (partial) of the talus on the calcaneus exhibited navicular drop.
- However, every patient with navicular drop exhibited anteromedial dislocation of the talus on the calcaneus.
- Navicular height significantly increased by an average of 26% following hindfoot stabilization with **HyProCure**[®].
- **HyProCure**[®] was effective in improving the anatomic alignment of the talonavicular joint.
- This should lead to a decrease in force placed on the medial column of the foot and therefore a decrease in strain on the supporting structures.