

Unique treatment approach to achieve plantigrade foot after failed talo-navicular arthrodesis

Tara L Harrington DPM, MBA, MHA¹, Elizabeth Tronstein DPM, MPH¹, David Seegmiller DPM, FACFAS²

¹ PGY-3 Intermountain Medical Center

² Attending Physician Intermountain Medical Center

STATEMENT OF PURPOSE

The purpose of this case study is to present a novel approach for treatment of complicated failed talo-navicular arthrodesis, which developed into a non-union and avascular necrosis of the navicular with talar neck fracture. Given the multiple complications with this patient and the initial salvage procedure was unsuccessful, we were left with trying a innovative treatment option which was successful.

LITERATURE REVIEW

Primary avascular necrosis of the navicular can have multiple causes such as transient osteoporosis and Mueller-Weiss syndrome. Secondary osteonecrosis of the navicular can be associated with rheumatoid arthritis, renal failure, lupus erythematosus, stress fracture of the tarsal navicular, and trauma. Avascular necrosis of the navicular characteristically displays radiographic evidence of a reduced size, a comma-shape, possible dislocation, and increased radio-density, fragmentation.

Treatment of non-unions include bone stimulator, bone graft; autograft, allograft or osteobiologic material, external fixation or internal fixation. Resection of the navicular is not traditionally a treatment for a failed TN arthrodesis or avascular necrosis of the navicular. Resection of the navicular is more commonly associated with treatment of Mueller-Weiss Syndrome (MWS). Other options for avascular necrosis of the navicular include those used for MWS. Navicular excision has been associated with the treatment of Cavovarus pathology. An option for MWS is resection of the necrotic bone which is then filled with autologous bone graft with or without use of an external fixator.

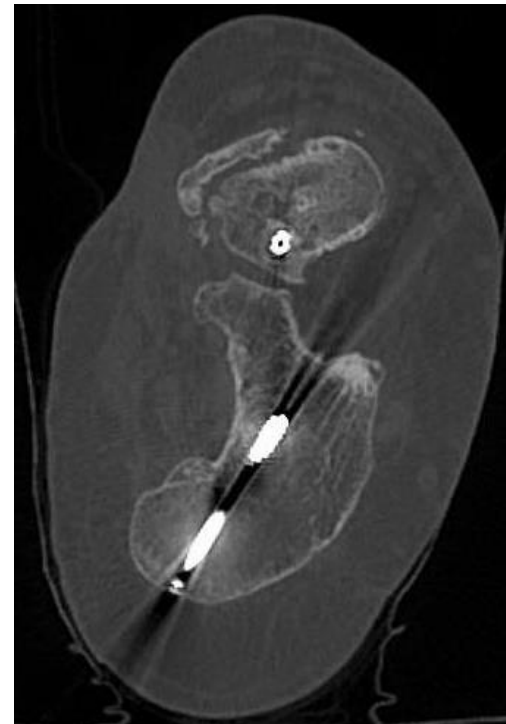


Image 1: Navicular fragmentation



Image 2: Navicular fragmentation

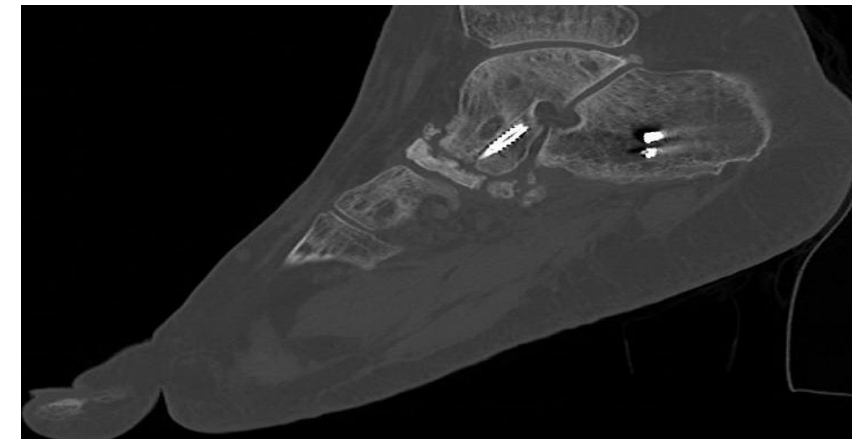


Image 3: Avascular necrosis with fragmentation of navicular



Image 4: Failed TN fusion. Avascular necrosis of navicular



Image 5: Post-resection of navicular

METHOD

A 45-year-old sensate, morbidly obese male with history of a talo-navicular arthrodesis and medial calcaneus osteotomy done by another surgeon which progressed into a talar neck fracture and non-union with broken hardware. The patient developed a non-union of the TN arthrodesis. He underwent hardware removal of failed TN fusion with application of Ilizarov external fixator which was unsuccessful. Once external fixator was removed, patient continued to have pain and developed AVN of his navicular with associated fracture. Patient was given options for reconstruction to fuse the talus directly to the cuneiforms or to place a bone block for distraction arthrodesis. Advised both of these options would be best augmented by use of an external fixator due to his osteopenia, but patient refused external fixator. Given the failed TN arthrodesis and failed Ilizarov external fixator, a novel surgical approach was attempted: simple resection of the navicular.

DISCUSSION

The patient was pleased with the outcome and ambulates pain-free with an AFO. The medial arch has maintained its position over time with normal Meary's angle, 1st metatarsal declination angle and Calcaneal inclination angle. The patient transitioned to weightbearing status over a 6-week period. He has been able to increase his activity and return to exercise. This case study details our navicular resection for the treatment of complicated non-union with avascular necrosis of the navicular along with talar neck fracture. The purpose of our approach is to achieve a plantigrade foot allowing for pain-free ambulation.

REFERENCES

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