

Replantation of the Navicular After Acute Dislocation in Charcot Neuroarthropathy Deformity

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Statement of Purpose

The purpose of this case report is to evaluate the efficacy of bone replantation after dislocation when reconstructing the Charcot foot deformity.

Literature Review

Joint dislocation often results in disruption of the vascular supply to a bone. This can result in avascular necrosis of bone. The likelihood and extent of bone death are directly related to the severity of dislocation. Charcot arthropathy is associated with compromise of the microcirculation of bone (1). Microcirculation compromise may result in poor bone healing or bone death. Charcot reconstruction surgery is associated with a nonunion rate as high as (25%) (2). With such high nonunion rates, it is unclear whether the combination of complete bone dislocation and Charcot arthropathy results in a severity of vascular compromise to bone to warrant excision rather than replantation of bone when surgically reconstructing the Charcot foot.

Case Study

67-year-old female with diabetic neuropathy, that presented with a left painful, edematous, and erythematous foot. Patient related an ice skating injury 2 months prior where she heard a pop in her foot. Examination revealed a rockerbottom deformity with instability noted within the left midfoot of the left foot with a dislocated navicular (Fig. 1) that had skin tenting along the medial side of the foot.



Fig. 1

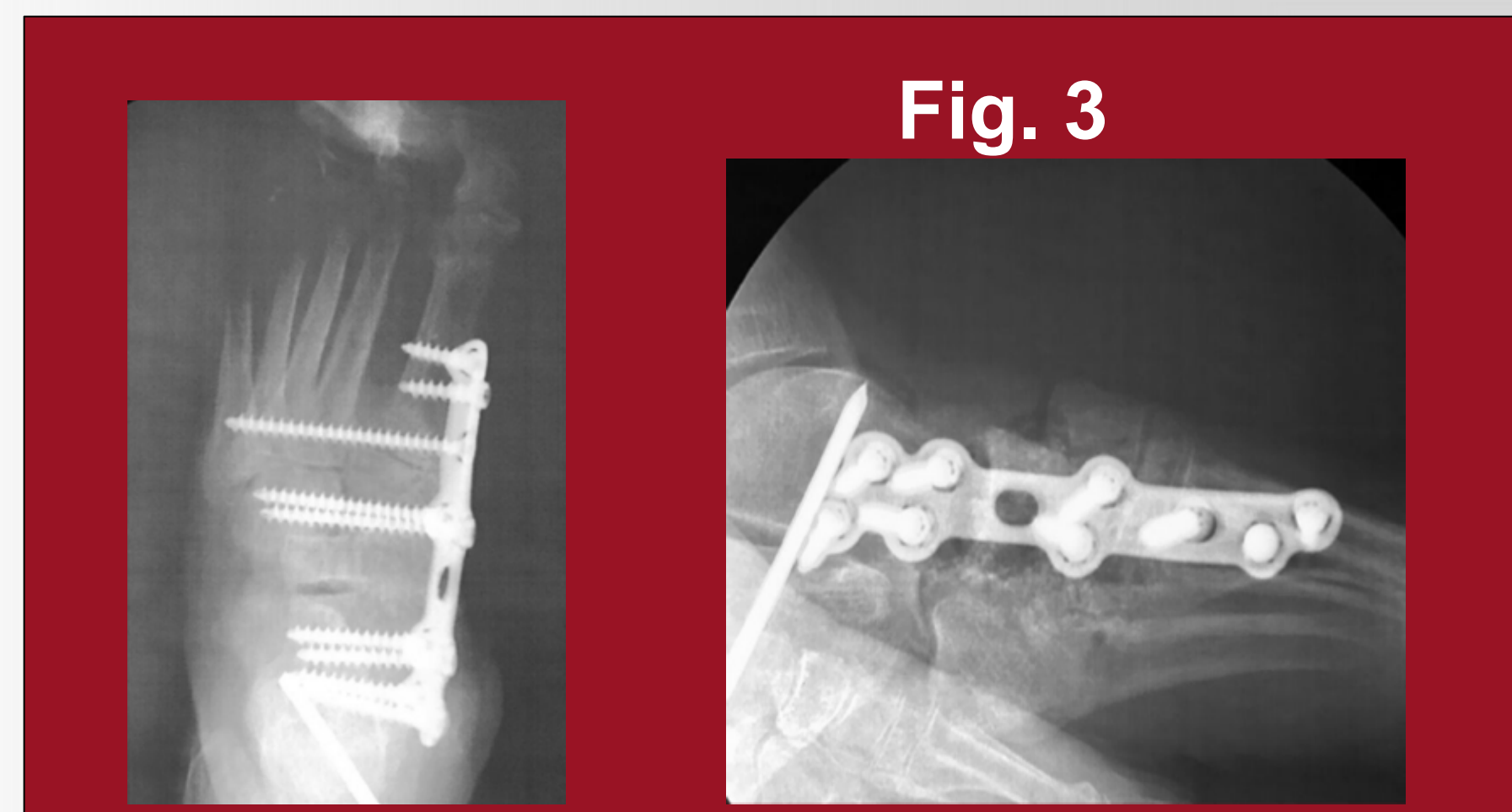


Fig. 3

Two-stage reconstructive surgery:

Stage 1 (Fig 2):

Achilles tenotomy

Navicular replantation

Midfoot osteotomy

Medial column fusion with internal fixation

Application of an external fixator

Stage 2 (Fig. 3) (at 8 weeks):

Subtalar joint arthrodesis

Lateral column fusion

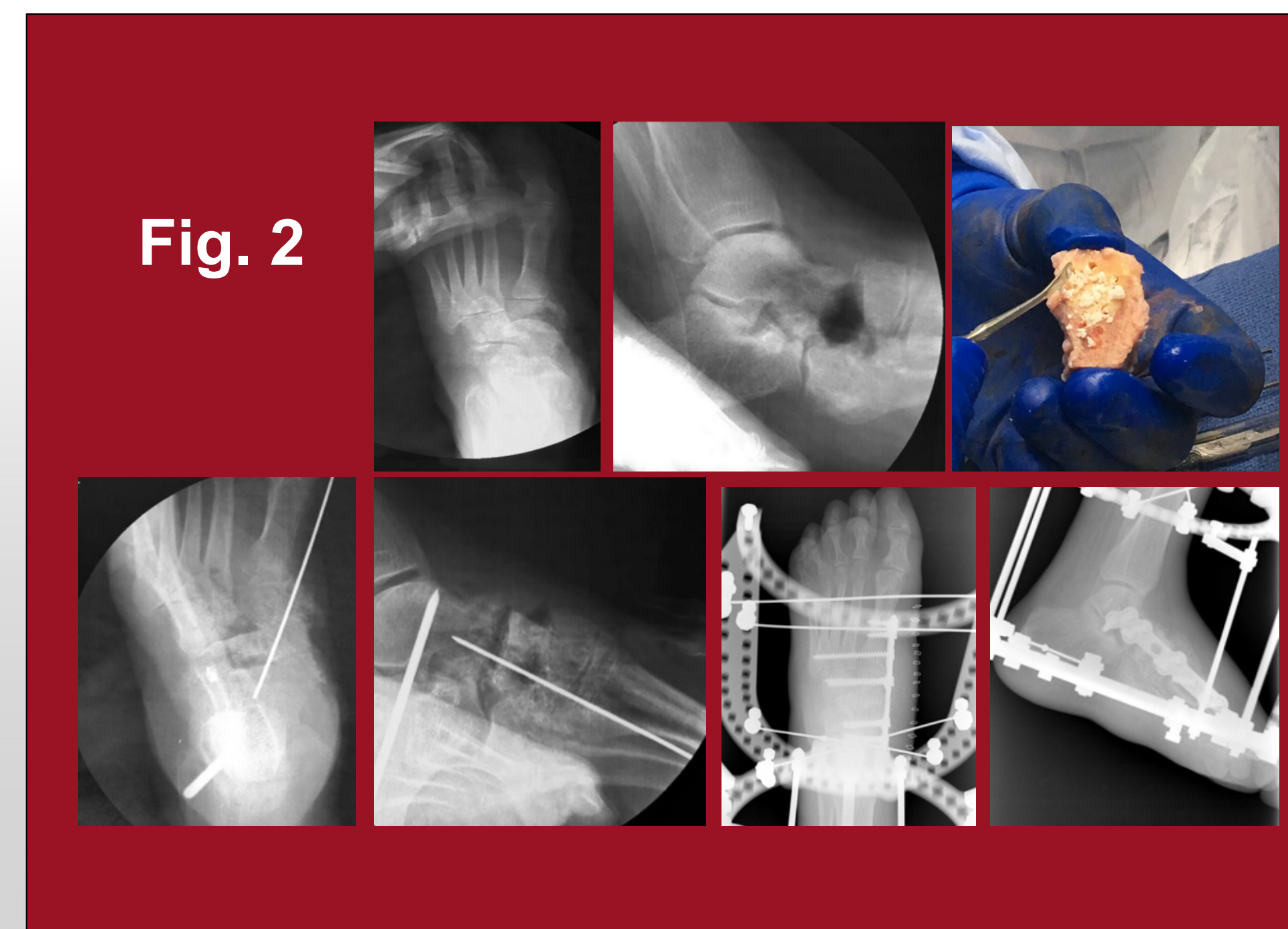


Fig. 2

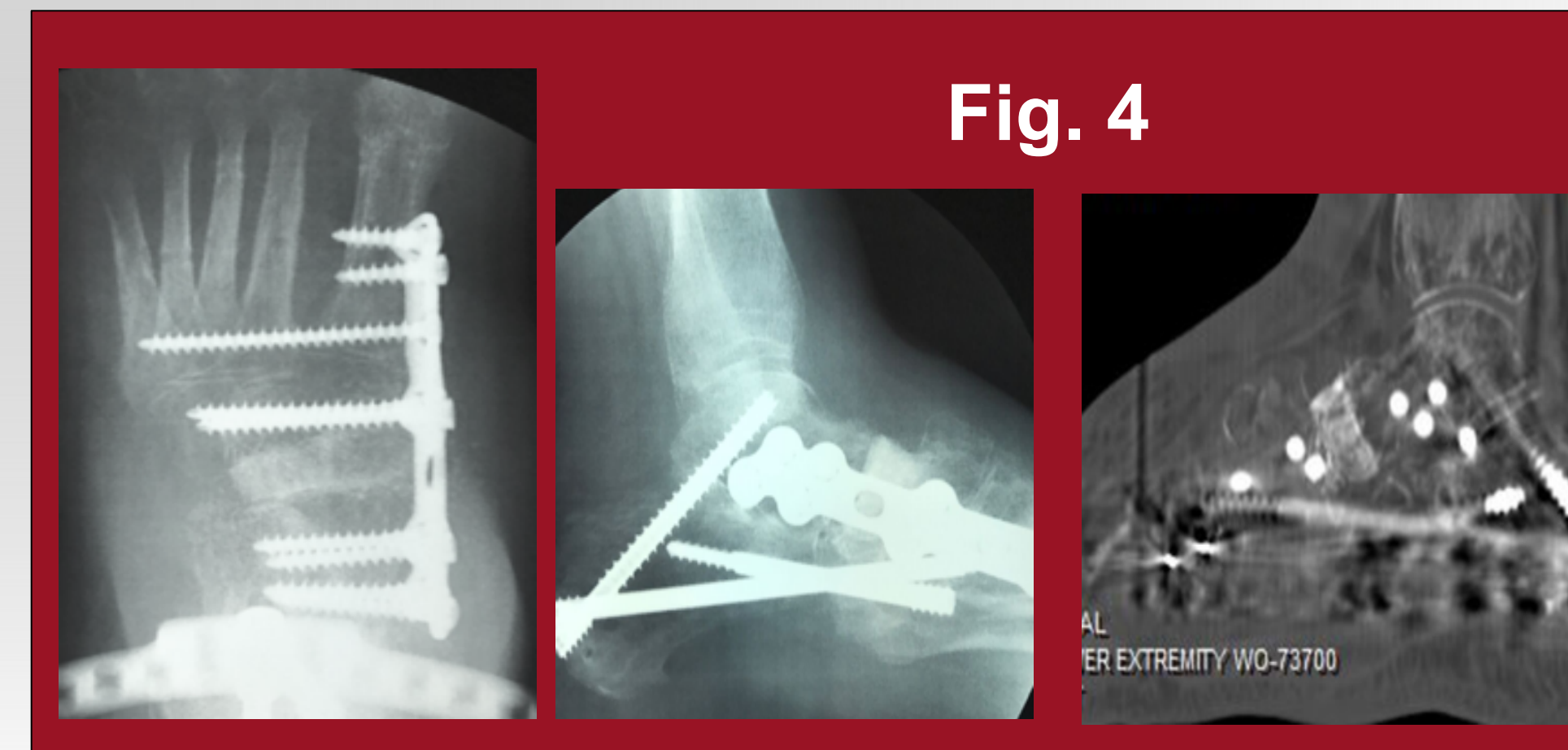


Fig. 4

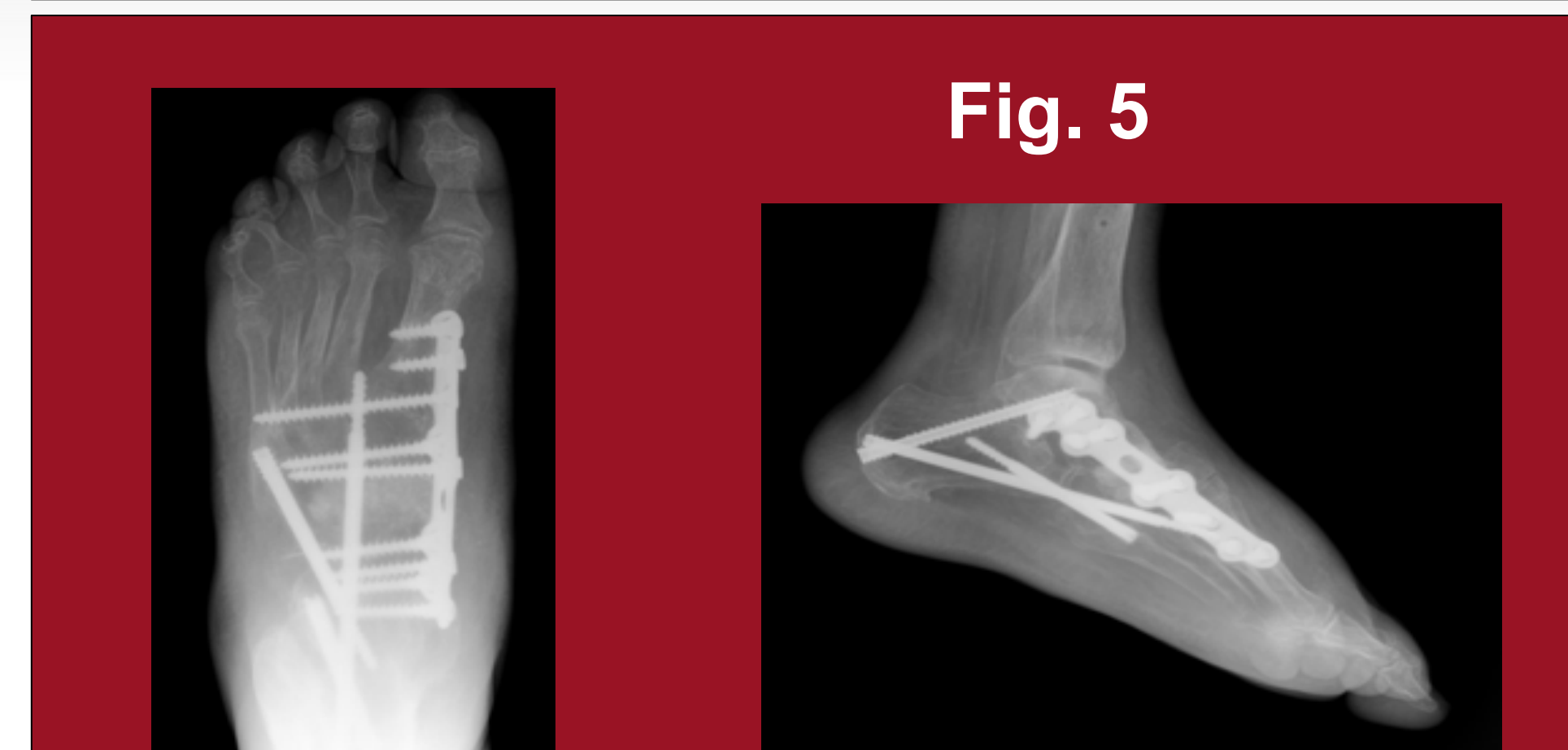


Fig. 5

Results

- CT confirmed fusion of the TN & NC joints at week 12 post-op (Fig. 4)
- External fixator removed at 14 weeks post-op, placed in a posterior splint for 1 week, and then 3 weeks in a below-the-knee cast
- Patient weightbearing at 18 weeks post-op in a CROW walker boot
- At 1 year post-op, maintained fusion of the TN and NC and foot alignment (Fig. 5), walking in an extra depth shoe
- The combined vascular damage of isolated tarsal bone dislocation of charcot arthropathy may not always result in complete avascular necrosis of a tarsal bone

Conclusion

- Isolated dislocation of a tarsal bone may not be an absolute indication for bone excision
- Tarsal bone replantation may be a viable option in Charcot reconstruction surgery.
- Dislocated tarsal bones may be considered orthotopic bone grafts in Charcot reconstruction surgery
- The combined vascular damage and isolated tarsal bone dislocation of Charcot arthropathy may not always result in complete avascular necrosis of a tarsal bone

References

1. Araszkievicz A, Soska J, Borucka K, et al. In diabetic Charcot neuroarthropathy impaired microvascular function is related to long lasting metabolic control and low grade inflammatory process. *Microvasc Res.* 2015;101:143-147. doi:10.1016/j.mvr.2015.07.008
2. Wukich DK, Raspovic KM, Hobizal KB, Sadoskas D. Surgical management of Charcot neuroarthropathy of the ankle and hindfoot in patients with diabetes. *Diabetes Metab Res Rev.* 2016;32:292-296.