

# Case Report: Treatment of A Periprosthetic Fracture with Distal Tibia Nonunion and Ankle Arthrodesis Malunion due to a Failed Pes Plano Valgus Procedure

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## Case Study

A complicated case of a 73 year old female with past medical history of hypothyroidism, malignant breast cancer, hyperlipidemia hypertension, gastroesophageal reflux presented to clinic with longstanding right ankle pain and end stage arthritis for a second opinion. Patient had a neglected pes plano valgus deformity, which had progressively worsened over the years (**Fig. 1**). Patient states one year prior she had a right ankle arthrodesis fixated with a lateral plate and fibula take down, which resulted in a malunion. The failure of the ankle arthrodesis was the lead cause of a periprosthetic fracture of the distal tibia and development of a hypertrophic valgus non-union of the distal tibia (**Fig. 2**). Patient elected to have reconstruction of her hindfoot, with the knowledge of failure of this surgery may lead to a proximal amputation.

The purpose of this case study was to demonstrate a successful limb salvage involving a periprosthetic fracture with multiplanar hindfoot deformities of the lower extremity.

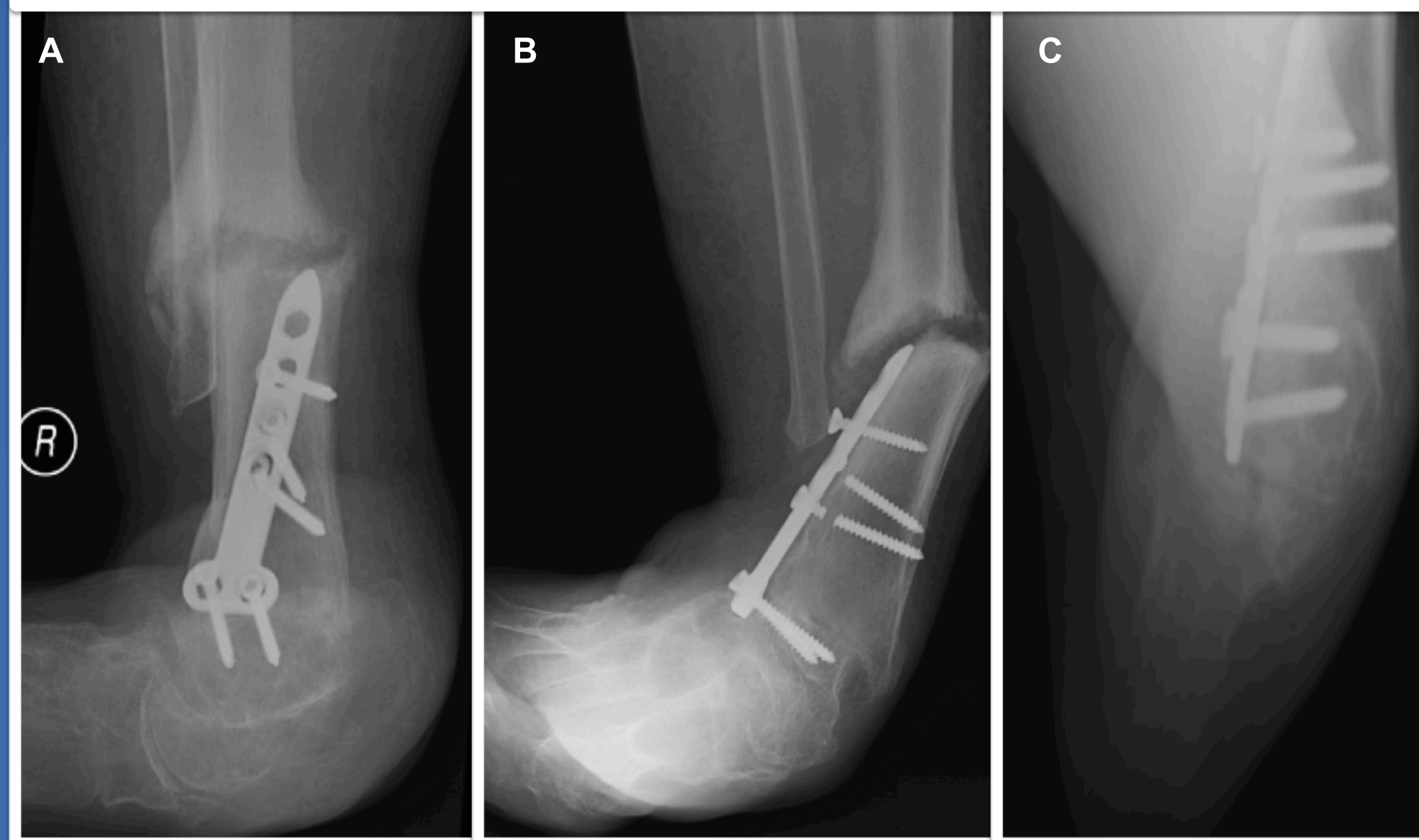
Figure 1: Preoperative Clinical Images (A)-(B)



## Method

Acceptable correction of a bifocal multiplanar deformity achieved with the use of a retrograde femoral nail and intraoperative fluoroscopy. Serial postoperative x-rays were obtained, to evaluate the maintenance correction of the rotational deformity and to assess for adequate tibial osteotomy site union.

Figure 2: Preoperative Films (A) Lateral view, (B) AP view, (C) Calcaneal Axial view



## Procedure

Distal tibial nonunion site was prepared by removing heterotopic bone. There was a residual valgus deformity, which was corrected by performing a medial closing base wedge osteotomy of the tibia. The initial osteotomy cut was started using a sagittal saw blade and finished with an osteotome. The ankle was then fused by inserting a femoral retrograde intramedullary nail without a valgus bend built into the nail after reaming (**Fig. 3**). Prior hardware was removed as needed.

## Results

At 5 months postoperatively, she clinically and radiographically had a healed tibial osteotomy site with adequate alignment (**Fig 4A-B**). Patient had residual external rotation, but this originated from the hip. There were no noted complications or wound dehiscence after surgery. Patient is able to appropriately bear weight on the extremity (**Fig. 4C**).

## Discussion

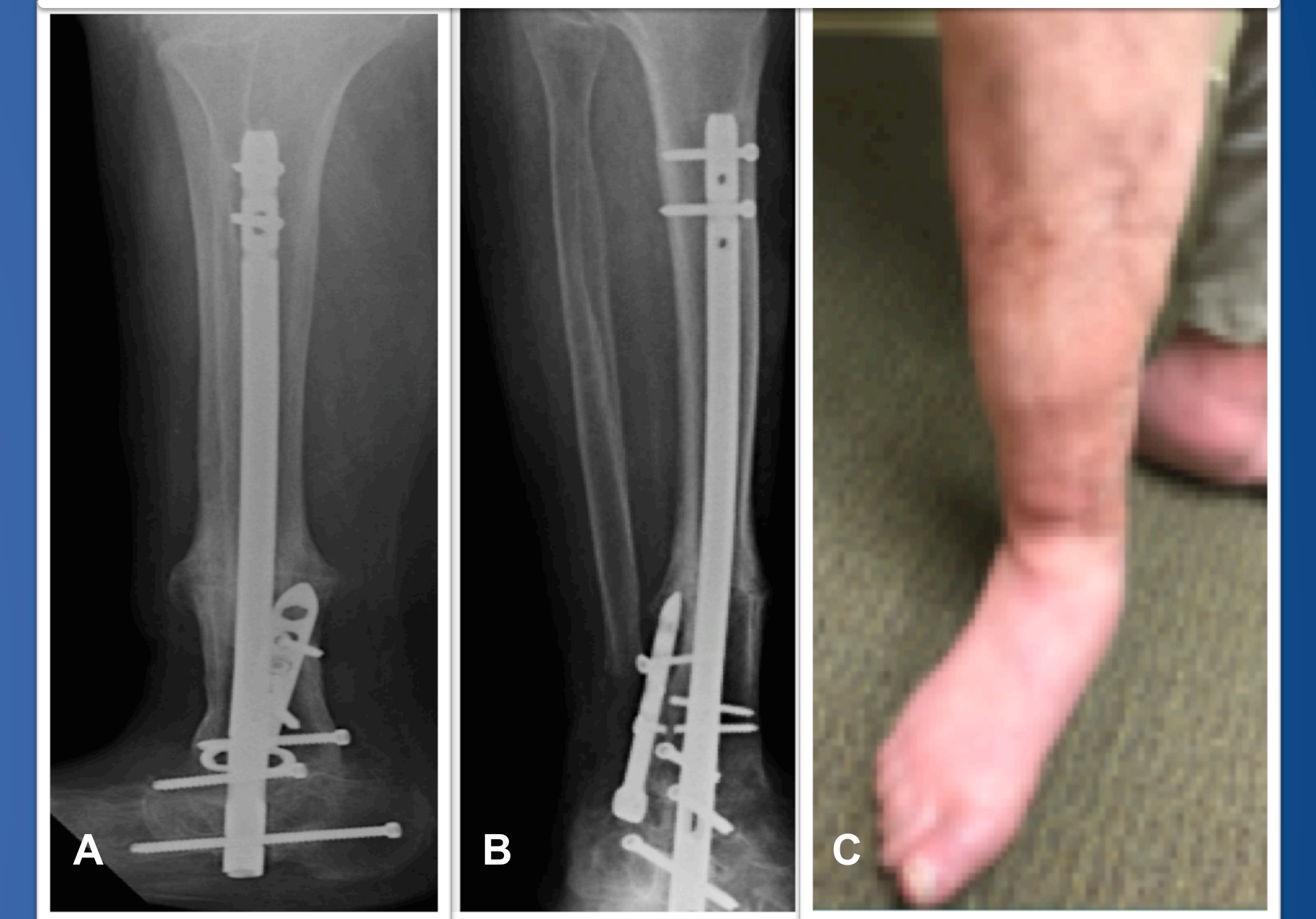
This is a unique case of a periprosthetic distal tibia fracture that progressed to nonunion secondary to ankle valgus malunion. Careful preoperative planning was taken since this was a limb salvage case. Periprosthetic fractures that result in non-union are not readily seen after an ankle fusion especially when utilizing a plate (1). The use of a longer intramedullary nail should be considered, to avoid recurrence of a periprosthetic fractures. The long term results and outcomes of a revisional tibiototalcalcaneal arthrodesis after a periprosthetic fracture has not been readily studied and further research is needed in foot and ankle literature (1,2). Furthermore, it has been shown to treat a tibial nonunion and tibial fractures the use of reaming with an intramedullary rod is a more effective method of obtaining a union especially in an arthrodesis that has failed previously with limited complications postoperatively (3-5). It has been shown in the literature that there is a biomechanical advantage of using posterior to anterior screws in the calcaneus (1, 6).

In conclusion, a long retrograde intramedullary nail was used to effectively treat bifocal deformity from periprosthetic fracture nonunion secondary to ankle arthrodesis malunion.



Figure 3: Immediate Post-Operative films (A) Mortise view, (B) Lateral view

Figure 4: 5 Months postoperatively patient has a healed tibial osteotomy and ankle arthrodesis sites noted on the Lateral and AP views (A)-(B). Patient bearing weight on right foot (C).



## References

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