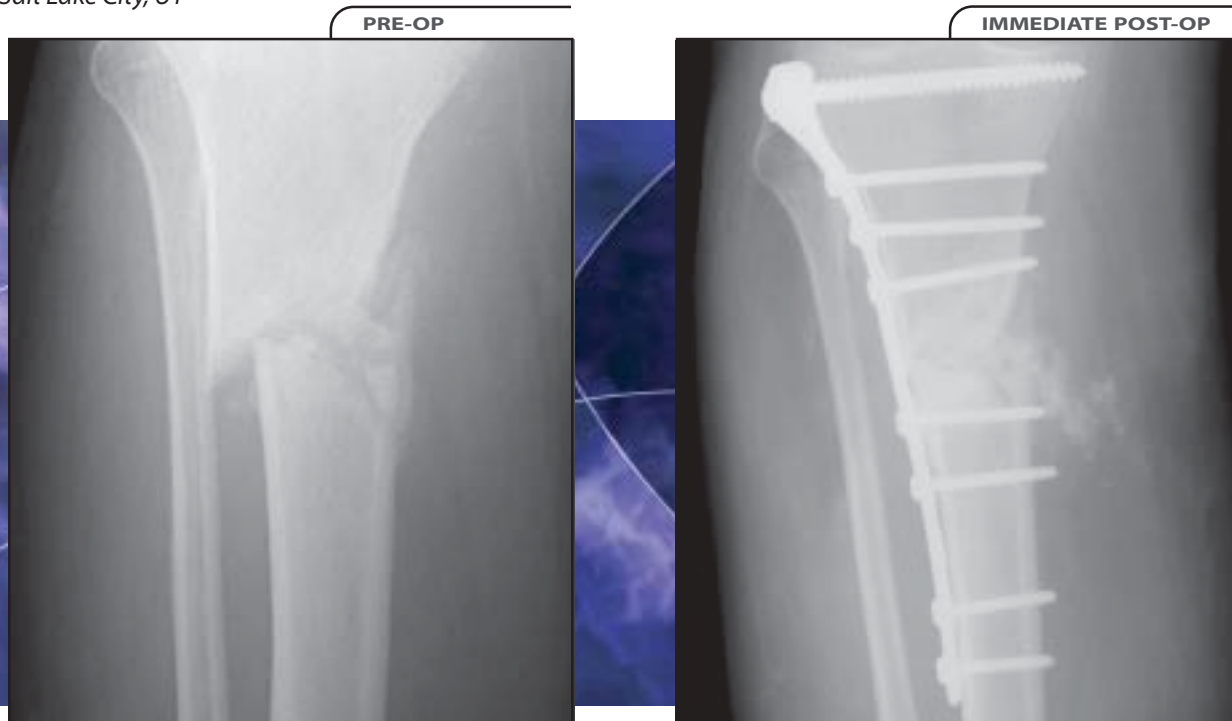


# CELLPLEX™ TCP Synthetic Cancellous Bone Closed Grafting of a Tibial Nonunion Using a Novel Porous Tricalcium Phosphate Combined with Bone Marrow Aspirate

**Daniel Horwitz, MD**  
University of Utah  
Health Sciences Center  
Salt Lake City, UT



## INTRODUCTION

Nonunions present the clinician with a difficult healing scenario. Often fracture stabilization is the key to a successful outcome. However, there are instances in which the local biology combined with surgical dissection can significantly affect healing response. The case that follows is a nonunion that resulted from closed treatment of a tibia fracture. Due to the motion at the fracture site, heavy fibrous tissue infiltrated and prevented bony union. Plate fixation and subsequent grafting has resulted in a successful early functional and radiographic outcome.

## PATIENT PROFILE

The patient is a 65 year-old male who suffered a metadiaphyseal fracture of the right tibia in an automobile accident. Initial fixation consisted of immobilization in an above knee cast for 6 weeks followed by a fracture brace. After approximately five months this patient presented with a nonunion and gross motion at the fracture site. No fracture consolidation was evident upon initial radiographic evaluation. The patient was scheduled for ORIF and grafting with CELLPLEX™ TCP Graft plus bone marrow.

## SURGICAL METHOD

An anteriolateral approach to the proximal tibia was made and the pseudoarthrosis was debrided of interposed fibrous and synovial type tissues. Lateral plate fixation was carried out in standard fashion and the fracture site was grafted using CELLPLEX™ TCP Graft in combination with aspirated bone marrow.

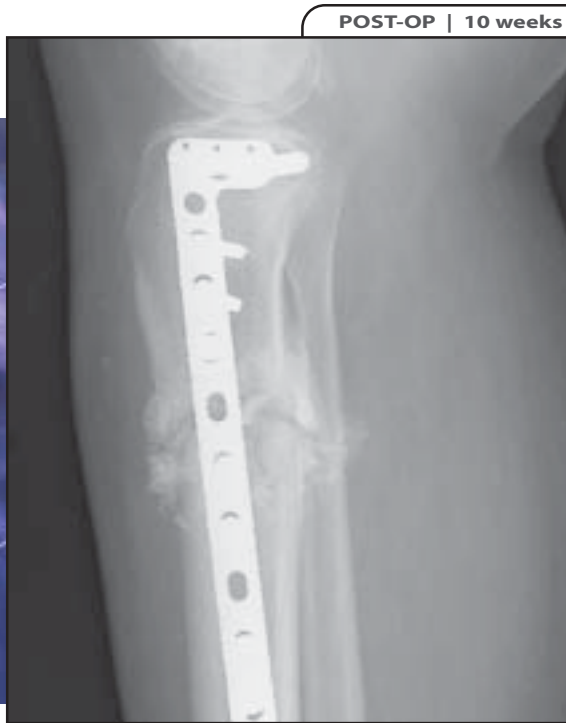
Bone marrow aspiration was carried out taking care to reposition the needle after aspirating every 2-3 ccs to prevent aspiration of peripheral blood and increase the aspiration of mesenchymal stem cells (MSC) within the aspirate.

The aspirated marrow was combined with the CELLPLEX™ TCP Graft by injecting the aspirate into the INFILTRATE™ Marrow Infusion Chamber and allowed to clot (about 10 minutes).

The graft was cut and digitally packed through the incision site anteriorly and laterally to fill the defect. Additional CELLPLEX™ TCP Graft was placed posterolaterally using a minimally invasive grafting system taking care not to violate the neural and vascular structures. Closure was carried out in standard fashion.

### POST-OPERATIVE COURSE

The patient was touchdown weight bearing for six weeks. Partial weight bearing was initiated at six weeks and at ten weeks follow-up the fracture site demonstrated no motion, good callus formation and consolidation of the fracture site. Clinically the patient reports no pain and has advanced to full weight bearing. The graft will resorb over time and may still be evidenced in the soft tissues posterolaterally at



the injection site at 10 weeks. This is expected to resolve uneventfully over the next few months. Otherwise, the patient is healthy and full weight bearing at this time.

### DISCUSSION

Good acute fracture fixation is essential for successful outcomes. Even so, nonunions may still result due to poor vascularity and poor biology. A new porous tricalcium phosphate (CELLPLEX™ TCP Graft) that more closely mimics human cancellous bone has recently been developed for grafting difficult fractures and nonunions. This material is conveniently packaged in the INFILTRATE™ Marrow Infusion Chamber, which is a novel bone marrow aspiration and mixing system. This composite graft is a viable alternative to iliac crest graft.



*CELLPLEX™ TCP Graft is conveniently packaged in the INFILTRATE™ Marrow Infusion Chamber to provide easy and efficient mixing with aspirated bone marrow.*



#### Wright Medical Technology, Inc.

5677 Airline Road  
Arlington, TN 38002  
901.867.9971 phone  
800.238.7188 toll-free  
www.wmt.com

#### Wright Cremascoli Ortho SA

Zone Industrielle la Farlede  
Rue Pasteur BP 222  
83089 Toulon Cedex 09  
France  
011.33.49.408.7788 phone

™Trademarks and ®Registered trademarks of Wright Medical Technology, Inc.  
Covered by one or more of the following patents. US Patents 4,865,871, 5,024,830, 5,336,616.