

Bone Gel – Marrow Aspirate Composite in the Treatment of a Type III B Tibia Fracture: A Case Report

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Patient C.F. is a 20 year old female who presented to the Nassau County Medical Center Emergency Room after sustaining multiple injuries in a motor vehicle accident. The patient presented with an unstable right Colles fracture, a left brachial plexopathy, a grade III A open right tibia fracture, and a grade III B open segmental left tibia fracture with the compounding wound over the distal fracture site (Fig. 1).

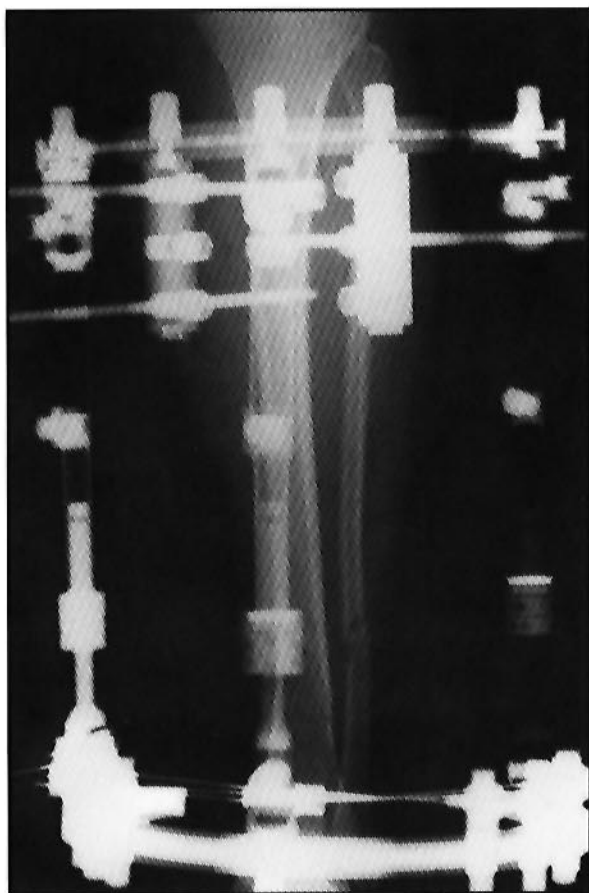


Fig. 1: Immediate post operative fixation of the left tibia.

The Colles fracture was treated with an external fixator and went on to uneventful osseous union. The left brachial plexopathy resolved with observation. Both open tibia fractures were treated initially with irrigation and debridement followed by reduction and immobilization with external fixation. The amount of

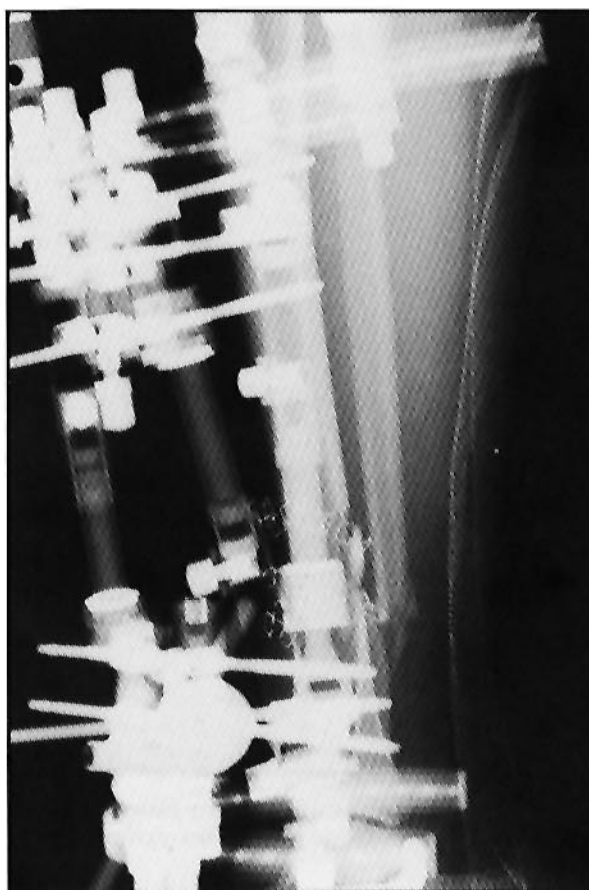


Fig. 2: Follow-up X-rays of the left tibia at three months denoting delayed left tibial osseous union.

soft tissue damage to the left tibia at the level of the distal fracture site was much greater when compared to the right open tibia fracture. The proximal left tibia fracture site was closed and went on to osseous union without difficulty.

The distal (open) left tibia fracture was not progressing to osseous union at the same rate as was the right tibia. At 3 months, the external fixator was removed from the right tibia and the limb was placed into a cast. During this procedure it was noted that the left tibia remained with minimal, if any, fracture healing (Fig. 2). It was during this same trip to the operating room that a 5 cc aspirate of bone marrow was obtained from the patient's left iliac crest through a bone marrow aspiration needle.

This was mixed with 10 cc of Grafton™ Allogeneic Bone Matrix, a proprietary gel form of human demineralized bone matrix.¹ The admixture was introduced into the medullary canal of the left tibia at the level of the distal fracture site under image intensification.



Fig. 3: Healing at three months following placement of bone gel-marrow aspirate composite with evidence of primary osseous integration.

Three months after placement, the allogeneic bone matrix-marrow aspirate composite was incorporated into the patient's tibia with evidence of primary osseous union (Fig. 3). The patient was allowed to bear weight as soon as the external fixator was removed and a PTB cast was placed on each extremity. The patient continues to complain of occasional weather ache but has full range of motion at the left ankle and knee with a strong osseous union at the distal fracture site.

Based on the favorable results of this case, further use of allogeneic bone matrix-marrow aspirate composite appears warranted for difficult tibia fractures with the potential for exhibiting delayed osseous union.

1. Musculoskeletal Transplant Foundation, Holmdel, N.J.