CASE STUDY
Tibiotalar & Subtalar Joint Arthrodesis w/ Avitus® Proximal Tibia Bone Graft Harvest

AVITUS® ORTHOPAEDICS
Minimum Access. Maximum Benefit.™

Surgery performed by Jeffrey McAlister DPM, fellowship trained foot and ankle surgeon at the CORE institute AZ.

Case Presentation

The following is a case of a 31-year-old Hispanic male with a history of a tibial pilon fracture and talus fracture/dislocation. Index procedure was performed in Mexico and was appropriately fixated but an unrecognized CFL injury left the patient in incongruent varus. At the eight-month mark, the patient had healed his talus fracture and nearly healed his pilon fracture. Weight bearing radiographs showed significant initial weight bearing radiographs showed significant incongruent ankle varus and retain hardware IMAGE 1. A follow-up computed tomography (CT) scan of the distal tibia and ankle revealed a healed pilon and talus fracture, but severe articular defects and arthritis. Patient was counseled on the long-term sequelae of these injuries and was consented for an ankle and subtalar joint fusion with bone grafting.

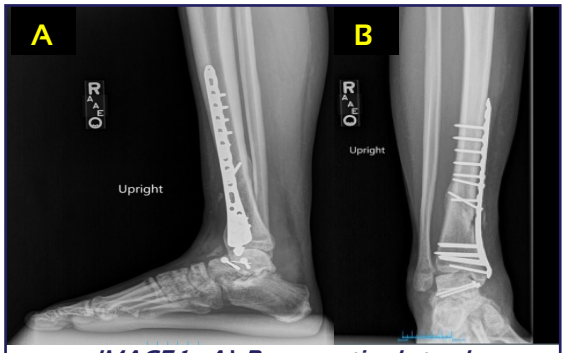

IMAGE 1 :: A) Pre-operative Lateral weightbearing radiograph demonstrating severe subtalar joint arthritis B) Pre-operative Anteroposterior (AP) weightbearing radiograph demonstrating varus and tibiotalar joint arthritis

Operative Technique

A 1.5 cm incision was made at the proximal medial tibia parallel to the tibial tuberosity. Blunt dissection was carried out to the level of periosteum. The Avitus® Pilot Hole Creator was used to perforate the cortex and create a 1 cm entry point. Next, the Avitus® Bone Harvester was inserted. A series of scraping and cutting maneuvers were executed during which the suction powered device rapidly obtained cancellous bone from the medullary space with liquid bone marrow continuously aspirating into the handle of the device (IMAGE 2). The device provides live feedback on bone volume and allows the surgeon to quickly visualize the obtained volume. 10 CC's of cancellous graft and 20 CC's of bone marrow were easily harvested (IMAGE 3). The procedure took approximately 5 minutes, much quicker than traditional techniques with obvious benefits of volume. The incision was packed with a gelatin sponge and closed in layers (IMAGE 4). Of note, the bone void was not back-filled but it is the surgeon's preference.

IMAGE 2 :: Avitus® Bone Harvester procuring cancellous bone and marrow under fluoroscopy. A medial approach was used to harvest the proximal tibia bone graft.

IMAGE 3 :: 10 CC's of Cancellous Bone retrieved from the Avitus® Bone Harvester and 20 CC's of Bone Marrow was obtained in approximately 5 minutes surgical time

IMAGE 4 :: Gelatin sponge packed into surgical site as a hemostatic agent

The cancellous bone was packed into the fusion sites with forceps (IMAGE 5, on pg 2). The handling of the graft was as expected, dense, ready-to-use and somewhat sticky, which made it easy to use. The liquid marrow can be spun down or mixed with allograft as needed.

Then after the graft was packed appropriately into the two fusion sites, the joints were aligned and a load-sharing intramedullary nail was inserted into the Hindfoot and tibia. All incisions were closed in layers and the patient's lower extremity was dressed in a bulky compressive dressing.

CASE STUDY
Tibiotalar & Subtalar Joint Arthrodesis w/ Avitus® Proximal Tibia Bone Graft Harvest

AVITUS® ORTHOPAEDICS
Minimum Access. Maximum Benefit.™

Operative Cost Savings

No additional bone graft was required or used for this complex tibiotalar and subtalar joint fusion. The Avitus® Bone Harvester saved the hospital at least $11,000.

Typically, the alternatives commonly used during these types of cases may include: 10 CC's of recombinant human platelet-derived growth factor (rhPDGF-BB) with 10 CC's of osteoinductive allogenic scaffold.

Post Operative 8 week follow up

The patient reported little pain (VAS 2 out of 10) at the proximal tibial bone harvest site that resolved at two weeks. No infections were recorded at the harvest site. No periarticular fractures were noted. Cancellous bone regeneration can be seen at the near 8 week follow up radiograph IMAGE 6. The cortical bone layer heals slower than the cancellous bone.

Osseous fusion at was noted (IMAGE 7).

Patients requiring tibial bone graft harvest are recommended to be non-weightbearing for approximately 6-8 weeks.

Practical Pearls

- Harvest site is guided by volume needed: calcaneus, distal tibia, proximal tibia (increasing in volume)
- Incision needs to be a half centimeter larger than the tip of the Harvester with a small SENN retractor
- Confirm Avitus® Pilot Hole Creator trajectory on Fluoroscopy to ensure metaphyseal entry
- Enter the pilot hole at an acute angle relative to the long axis of the bone with the tip oriented down
- Back-filling is surgeon's preference

Conclusion

Avitus® Bone Harvester has provided my patients high volume autograft for primary and revision fusions with excellent outcomes and cost-savings.

-Jeffrey McAlister, DPM
The CORE Institute
Phoenix, AZ

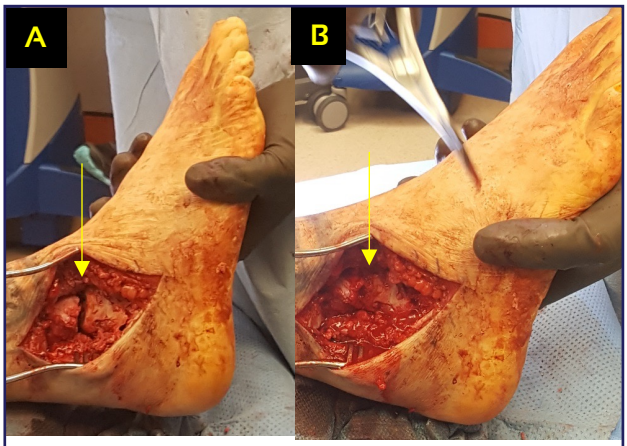

IMAGE 5 :: A) Before packing defect B) After packing defect with Avitus® gold standard cancellous bone.

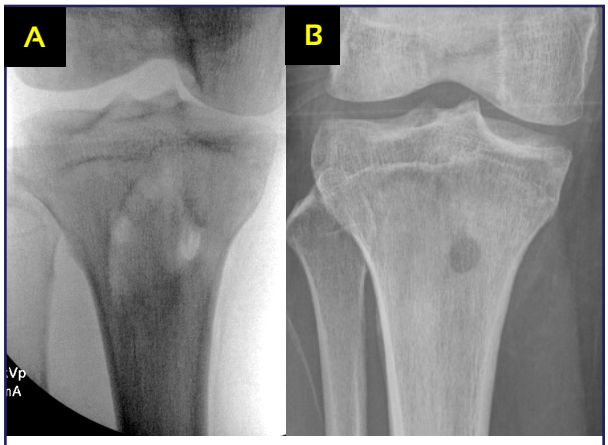

IMAGE 6 :: A) 12/8/2017 – intraoperative radiograph of harvest site B) 2/1/2018 – post operative radiograph of harvest site showing cancellous bone regeneration

IMAGE 7 :: A) 11/9/2017 – preoperative (AP) B) 2/1/2018 – Radiograph at near 8 week follow up showing osseous fusion