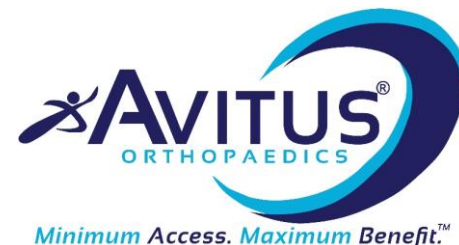


## WHITE PAPER SERIES

# 1<sup>st</sup> TMT + 1<sup>st</sup> MPJ joint fusion with calcaneus bone harvest



Surgery performed by Danielle Butto, D.P.M., AACFAS and Rachel E. Balloch, D.P.M., AACFAS foot and ankle surgeons at St. Francis Hospital in Connecticut.

## Case Presentation

The following is a case of a 53-year-old who presented with complaint of long term pain and deformity to the right foot. Physical exam revealed an isolated gastrocnemius equinus with hypermobility at the first tarsal-metatarsal joint. The first MTPJ complex was subluxed with limitation and crepitus noted on range of motion. There was a very prominent medial eminence. Weight bearing AP radiographs showed a large intermetatarsal and hallux abductus angle. There is joint space narrowing with cystic changes in the first metatarsal head (EXHIBIT A). The patient was consented for a gastrocnemius recession, first tarsal-metatarsal joint fusion, harvesting of bone graft and first metatarsal-phalangeal joint fusion.



## Operative Technique

A 1.5 cm incision was made at the lateral calcaneus. Fluoroscopy was utilized to ensure correct placement. Blunt dissection was carried down 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 posterior central calcaneus with liquid bone marrow continuously aspirating into the handle of the device (EXHIBIT B). The device provided live feedback on bone volume and allowed the surgeon to quickly visualize the obtained volume. 7.5 CC's of cancellous graft and 5 CC's of bone marrow were easily harvested (EXHIBIT C).

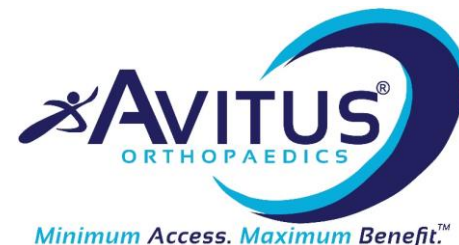


The harvesting procedure took approximately 2 minutes, much quicker than traditional techniques. The incision was closed in layers. No additional bone void fillers were used to back-fill. The first MPJ was prepared using a combination of reamers, sagittal saw and burr to denude the joint of all cartilage and perforate the subchondral plate. There was noted to be a central bone cyst which required grafting (EXHIBIT D).



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## Operative Technique (continued)

The cancellous bone was packed into the first metatarsal head to fill the bone void (EXHIBIT E). A 4.0 interfragmentary screw was placed across the 1<sup>st</sup> MPJ. The remaining graft was placed as a shear-strain graft at the fusion site (EXHIBIT F). The liquid marrow was poured directly into the fusion site. A locking plate was then placed (EXHIBIT G). All incisions were closed in layers and the patient's lower extremity was dressed in a bulky compressive dressing.

## Operative Cost Savings

No additional bone graft was required or used for this fusion.

Typically, the alternatives commonly used during these types of cases may include: 3 CC's of recombinant human platelet-derived growth factor (rhPDGF-BB, \$3,000).

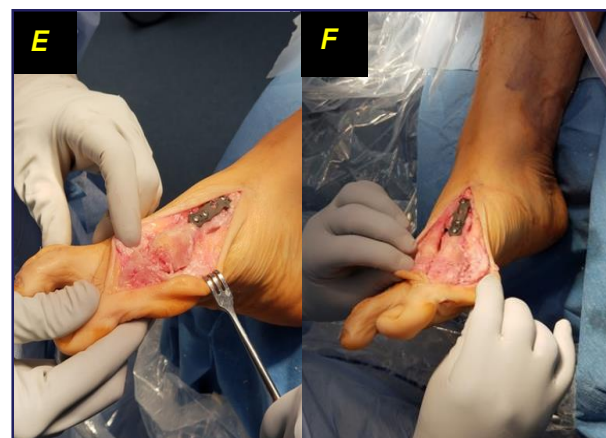
## Post Operative 12 Week Follow Up

At immediate follow up 1 week following procedure the patient reported no pain to the harvest site. The area remained pain free throughout the post-operative course. The patient achieved successful fusion and was able to partially weight-bear in a below knee fracture boot at 4 weeks. No infections were recorded at the harvest site. No fractures to the calcaneus or hematoma at the harvest site were noted. The patient is now 12 weeks post procedure (EXHIBIT H). The patient is weight-bearing in regular shoe gear with no pain or complications.

## Conclusion

This is one example of how the Avitus<sup>®</sup> Bone Harvester has enabled me to provide my autograft for a primary fusion with a bone cyst in the area of fusion. The patient achieved an excellent outcome and the device provided a significant cost-savings to the hospital.

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**EXHIBIT E** :: Joint arthrodesis site after successful grafting of cyst.

**EXHIBIT F** :: Shear-strain grafting to the dorsal MPJ



**EXHIBIT G** :: Final construct



**EXHIBIT H** :: Final post-operative image with successful fusion and healing of the harvest site