

ALEXANDER **ORTHOPAEDIC** ASSOC.

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Local surgeon successful in Florida's first ever custom 3-d printed ankle replacement

St Petersburg, FL – On Thursday, January 18, 2018 Alexander Orthopaedic Associates (AOA) foot & ankle surgeon, Dr. Adam Perler performed the state's first ever successful custom 3D printed partial (talus) ankle replacement. His patient, a healthy 36-year old woman, was living with severe and debilitating pain in her ankle following an injury that occurred at her job almost two years ago. The injury, which was initially diagnosed as a simple ankle sprain, caused significant damage to the cartilage on the talus located on the inner aspect of her ankle. Despite two prior surgical repair attempts to address it with an ankle scope and microfracture (traditional treatment of a defect in the cartilage) there was no improvement to the area leading to progressive posttraumatic arthritis of that part of the ankle.

The Tampa, Florida woman came to Dr. Perler after failed initial treatment with other local surgeons who felt that she needed to either learn to live with her chronic pain using long-term narcotics or she could have her ankle joint fused, which would lead to a permanent limp and likely prevent her from returning to her original job. Total joint replacement was not initially offered due to her age. Dr. Perler, a very experienced and innovative foot and ankle surgeon known for highly advanced work in complex deformity correction, ankle joint replacement surgery, ankle trauma and reconstruction, said, "Until the last few years, I would have likely agreed with those physicians. Her ankle was heavily eroded over the medial shoulder of her talus (inner ankle) and focal replacement of the area was only possible with the use of a cadaver bone (from an organ donor with similar size/proportions to the patient) where a piece of donor bone is swapped out with the patient's diseased bone. While I have successfully done this in the past, the results are very unpredictable. There have always been issues with precise fit, graft fixation and incorporation of the graft into the surrounding bone. In addition to the difficulty of obtaining a perfect fit, according to the literature, there is up to a 50% chance the body will reject the graft which make further reconstruction efforts much more challenging. Several years ago, I did a complex case where I used 3D printed titanium to replace a segment of someone's missing ankle bone, but the technology was only used to address bone voids and could not "resurface" or emulate a joint surface. Six months ago, I became aware of, and involved with a new innovative company that has significantly advanced the process involving 3D printing to the point where custom joint surfaces can be "printed" to anatomically fit the exact anatomy based on CT scans of the patients own anatomy."

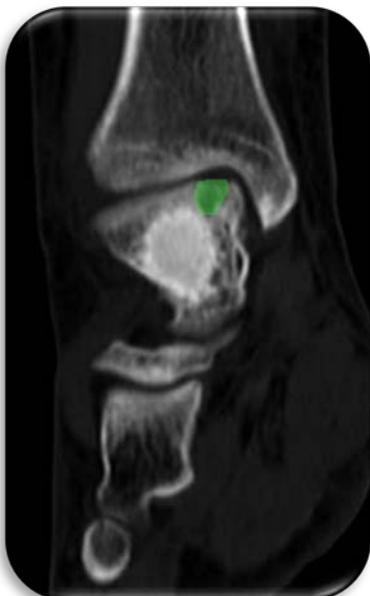
The advent of 3D printing custom devices promises to significantly improve graft incorporation and fit thus improving long term outcomes, patient satisfaction and promises to unlock new levels of surgeon creativity to address the more challenging foot and ankle deformities.

Dr. Perler sent an X-ray and CT image of both the woman's healthy and compromised ankles to Additive Orthopaedics to make 3D imagery of the good ankle in mirror reverse. Subsequently, together they created a custom precise and patient specific cutting guide and partial joint replacement implant made of a highly polished titanium to replace only the damaged part of the talar bone at the inner ankle (medial talar shoulder).

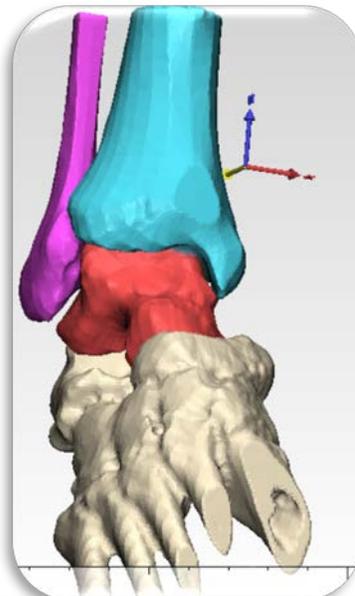
According to the manufacturer, to date, a limited number of custom ankle replacements have been attempted in the U.S. with success by only a few select surgeons including Dr. Perler. "My goal is to always stay on the cutting edge of technology so that I can continue to offer my patients the most up to date and advanced treatments available," says Dr. Perler.

The patient is now only six weeks out from the surgery and is already full weight bearing with the use of a special boot. With the help of physical therapy, she will be back in a regular shoe by post-operative week eight. The patient can already tell that the pain that she had prior to her surgery is significantly improved. Dr. Perler is hopeful that his patient will be able to return to work unrestricted within the next couple of months, something she has not been able to do since her initial injury over two years ago.

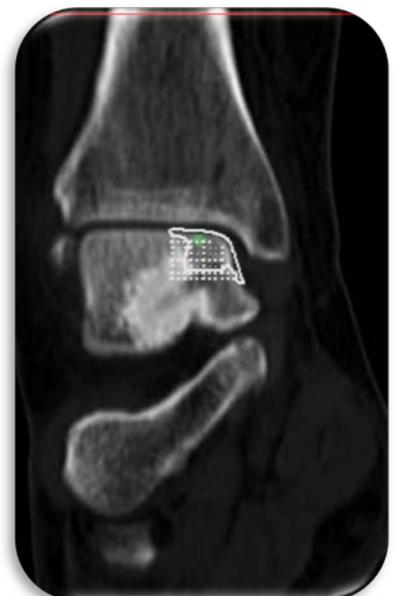
Dr. Perler is one of the founding members of the American Orthopaedic Society of 3D Printing. Dr. Perler is also highly involved in new product development and is currently part of an exclusive group of design surgeons who are working on a new total ankle replacement system that is due out later this year. He currently holds two patents with another one pending on his own designs. Always thinking ahead of the curve, Dr. Perler, an advanced trained podiatric surgeon aspires to expand this and other emerging technologies throughout the entire skeletal system to benefit patients head to toe.



CT Scan showing defect (green)



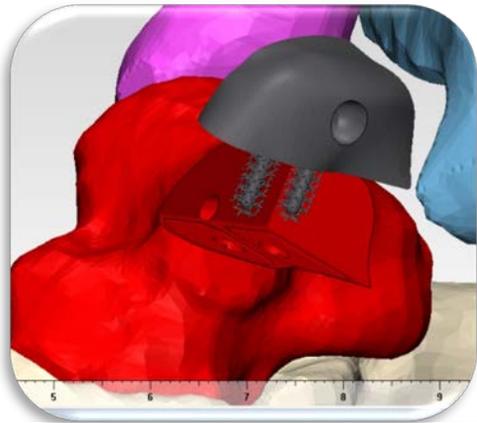
Computer Rendering of Ankle



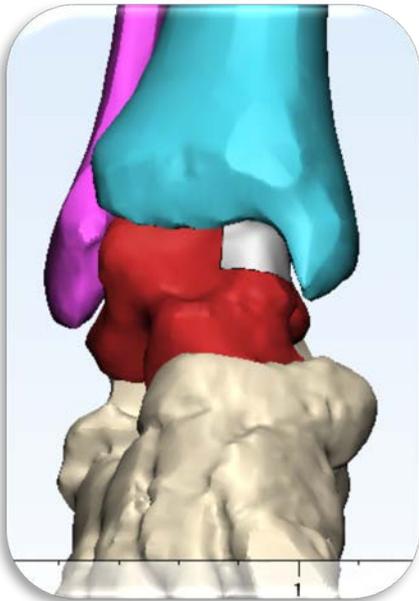
Implant Sizing on CT Scan



Actual Custom Implant and Cutting Guides



Computer Rendering of the Custom Implant Technique



Computer Rendering Final Talar Implant Placement



Actual Pictures from Surgery Showing Final Implant Placement