A patient-specific customized 3D printed total talus replacement in treating an avascular necrosis of the talus

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INTRODUCTION:

Avascular necrosis (AVN) of the talus remains a surgical challenge to be tackled in the Foot & Ankle field. We illustrate a case of chronic AVN of talus treated with a novel type of patient-specific custom 3D printed total talus replacement as an option of treatment.

REPORT:

A 56-year-old Indian male, alleged motor vehicle accident and sustained an open comminuted left talus fracture with segmental fracture of the left fibula which developed an AVN of the talus. Patient was in tremendous amounts of pain with limitation of ankle mobility.

To avoid issues of loosening and subsidence with total ankle arthroplasty or sacrificing mobility with ankle arthrodesis, we customized a patient specific 3D printed talus for him based on the normal contralateral ankle CT scan. This produces an anatomic replica of patients own talus to recreate the joint congruence, ensure a perfect fit, mimic physiologic ankle joint movement and its biomechanics.

Challenges faced during insertion of the implant was to get the intact full sized implant into the ankle through the same anterior midline approach without sacrificing the lateral stabilizers.

Post-operatively patient had significant reduction in pain during ambulation and retaining good ankle mobility as compared to a total ankle arthroplasty or ankle arthrodesis. He was able to get dorsiflexion of 0-5° and plantarflexion of 0-10°.

CONCLUSION:

Customized total talus replacement should be considered as a promising treatment option for treating avascular necrosis of the talus. 3D printed implants is the future of getting implants as close as possible to the native bone shape.

Figure 1: Pre-operative AP and lateral radiographs of the talus AVN.

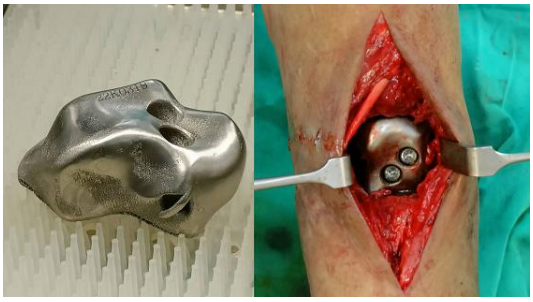

Figure 2: Intra-operative placement of implant.

Figure 3: Post-operative radiographs

REFERENCES:

1. Shnol, H et al., 3D Printed Total Talar Replacement: A Promising Treatment Option for Advanced Arthritis, Avascular Osteonecrosis, and Osteomyelitis of the Ankle. Clinical Podiatric Medicine and Surgery 2018 Oct ; 35(4): 403-422