# Complete closure of full thickness diabetic ulcers and exposed Tibialis Anterior tendon with intact fish skin\* in a Type I diabetic patient with Charcot Lisfranc fracture/dislocation

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# INTRODUCTION

Charcot Lisfranc fracture/dislocation cases that are complicated by the presence of full thickness infected ulcers and major tendon involvement can be challenging in creating a successful functional and fully healed outcome. These patients are often neuropathic due to diabetes and often have multiple additional comorbidities. The challenges include treating the infection, the timing and technique for a functional reduction and fixation, and healing and maintaining wound healing and function.

## **METHODS**

This 33-year-old Type I Diabetic first presented to the ED with an infected Charcot Lisfranc fracture/dislocation with exposed, infected and partially devitalized Tibialis Anterior tendon. The patient had no pain due to sever diabetic neuropathy. She also had a history of cardiac and renal disease and hypertension. She was a poorly controlled diabetic with HgbA1c of 12. The patient was working as a social worker.

The patient was admitted to the hospital, where x-rays confirmed the Lisfranc fracture/dislocation most closely resembling a Myerson Hardcastle Type A. Medical, cardiac, renal and diabetic management was initiated. ORIF was delayed due to the presence of full thickness infected ulcers medially laterally and on the anterior ankle. Debridement of the ulcers, deep wound cultures were obtained and the IV antibiosis was adjusted to reflect the results. Successful treatment of the infection was followed by ORIF.

The patient was discharged from the hospital and significant ulcers were still present medially laterally and anteriorly. We followed the patient and treated her weekly on our wound center, but healing was stalled despite compliance and offloading. We decided to use intact fish skin graft on the wounds and final closure occurred after 10 applications in total for the 3 ulcers

# CASE: 33-YEAR-OLD DIABETIC FOOT ULCERS

**Patient History:** 73-year-old with PMH of uncontrolled DMI, cardiac and renal disease, and lack of protective sensation in bilateral feet due to neuropathy. NO history of diabetic foot ulcers.

**Wound History:** Patient presented with a charcot Lisfranc fracture dislocation and diabetic ulcers with exposed Tibialis Anterior tendon in the right foot

**Fish Skin Graft Applications:** 10 total applications of intact fish skin graft including sheets and fragmented product where complete closure was achieved in 14 weeks









Initial presentation







14 weeks post initial application – healed Wound achieved complete epithelization

1 year follow up visit– wound remains closed



### RESULTS

All three diabetic foot ulcers were achieved complete closure after 10 applications of intact fish skin graft. The patient was able to return to work with custom orthoses and approved shoe gear and maintained healing with a plantigrade foot and function of the Tibialis Anterior tendon

### CONCLUSIONS

The intact fish skin grafts have shown to closely resemble human epithelium and are also minimally processed. As a result, this provides clinicians with an excellent product to support the healing of their wound patients. In this case, we were able to cover hard-to-heal full thickness wounds and Tibialis Anterior tendon and return our patient to their previous life and work. Continued monitoring is needed due to the severity of this injury and dangers of future ulcerations and Charcot. The patient also has serious medical issues at well that she is also seeking care for and that we are part of monitoring for compliance and success in the future.

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Hardcastle & Myerson classification of Lisfranc joint injuries. Myerson (Orthop Clin North Am 1989;20:655-664