

# Application of Chitosan and Chondroitin Sulphate Aerogels in a Patient With Diabetes With an Open Forefoot Transmetatarsal Amputation

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## Abstract

Introduction. Diabetic foot ulcers may lead to nontraumatic amputations of the foot, leading to a decrease in patient quality of life. Transmetatarsal amputations (TMAs) represent an effective surgical procedure in cases of severe foot infection, but the tissue reconstruction is complicated and additional procedures should be considered. The present case report evaluates the wound closure of an open TMA in a patient with diabetes treated with a new aerogel composed of chitosan (ChS) and chondroitin sulphate (CS), without needing a skin graft. Case Report. A 72-year-old man with diabetes and a history of successive amputations was admitted to a hospital in Valdivia, Chile, due to a severe infection of toes 2 and 4 of the right foot. After the diagnosis of gangrene and osteomyelitis, the patient underwent a TMA of his right forefoot. The surgeon proposed the incorporation of ChS and CS aerogels to accelerate wound healing to avoid another surgical procedure. The TMA surgical wound area closed 50% after day 28 from starting treatment with aerogels. Complete closure was achieved at day 94 of treatment with aerogels, with good epithelial tissue and favorable cosmetic results and without residual limb deformities. The patient experienced minimal physical and psychological impairment from the procedure. Other surgical procedures were not necessary. Conclusions. Due to the results of this patient, use of ChS and CS aerogels could represent an alternative treatment for forefoot TMA wound closure and prevent further surgical procedures, such as skin grafting. Future works should consider a larger number of cases.

## Palabras clave

Palabras clave de autor: [amputation](#); [diabetic foot ulcer](#); [extracellular matrix](#); [chitosan](#); [aerogel](#); [transmetatarsal amputation](#)

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