# A Twenty Patient Evaluation of a 100% Chitosan Dressing in the Treatment of Diabetic Foot Ulcers

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## Introduction

Diabetic foot ulcers (DFU) are complex multifactorial wounds with serious consequences if not treated swiftly and appropriately. DFU care costs the NHS in England over £1 billion per year, with much of the cost from treating prolonged diabetic foot ulceration.

Without timely intervention a DFU can quickly deteriorate, risking amputation. Effective local wound care and infection control are vital elements of DFU treatment within a broader, holistic care plan.

Our 'spoke' multi-disciplinary team in southeast London treats inpatients and outpatients with DFU's, collaborating with acute and community podiatry teams across the region. In 2022 the service became aware of a new chitosan gelling fibre dressing, MaxioCel. This case series evaluates the impact of MaxioCel on DFU treatment across twenty patients.

## Method

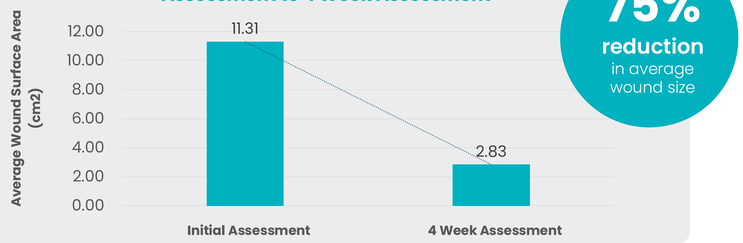
A single centre case series was undertaken at the multi-disciplinary diabetic foot clinic at the Queen Elizabeth Hospital, Greenwich. **Twenty patients** (3 female, 17 male) were recruited with exuding DFU's who were suitable for treatment with MaxioCel as a primary dressing. Assessments were made at baseline and each clinic visit, over a 4-week evaluation period, or until the dressing was no longer required. Digital photographs were taken to document wound progress at each clinic visit, with patient consent.

## Results

**The average wound duration** on initial presentation was **18.4 weeks.** Over the 4-week evaluation period, an impressive **75% reduction in average wound size** was recorded across the twenty patients, as wounds progressed toward healing. (Fig 1)

Fig 1

**Average Wound Surface Area Change From Initial Assessment to 4 Week Assessment**



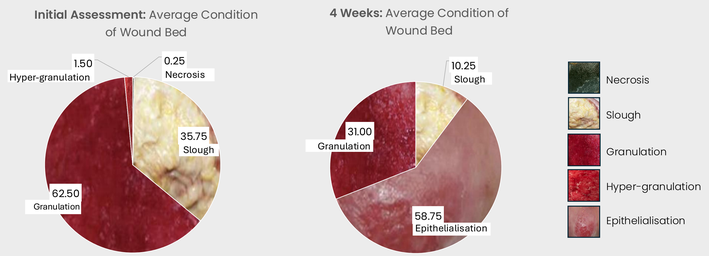

**75%** reduction in average wound size

When sharp debridement was performed and bleeding occurred, MaxioCel promoted haemostasis.

An improvement in wound bed tissue was also recorded, as MaxioCel facilitated autolytic debridement, with a 25% reduction in slough and 31% increase in epithelial tissue. It was also noted that MaxioCel helped to protect granulation tissue. (Fig 2)

Fig 2

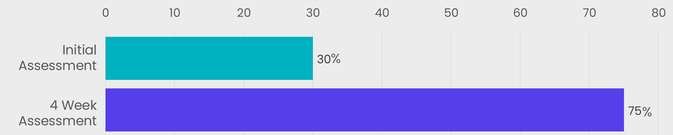
**Change in Average Wound Bed Tissue Type % from Initial Assessment to 4 Week Assessment**




Initially, the majority of wounds presented with moderate-high exudate levels and MaxioCel was found to manage these exudate levels effectively. This resulted in a **45% increase in healthy periwound skin.** (Fig 3)

Fig 3

**Average percentage of healthy periwound skin, from Initial Assessment to 4 Week Assessment**




## Discussion

In DFU local wound care, the focus should be on 'radical and repeated debridement, frequent inspection and bacterial control, and careful moisture balance to prevent maceration.' MaxioCel supports DFU healing by managing moderate-high exudate levels, reducing periwound maceration, controlling minor bleeding, aiding autolytic debridement, conforming to the wound bed and providing antimicrobial action.

MaxioCel is made from a naturally occurring polymer, chitosan, derived from a bio-compatible polysaccharide extracted from a sustainable shellfish source. MaxioCel is a cost-effective and biodegradable dressing. In a world where adopting a sustainable approach to wound care is increasingly important, these factors should not be undervalued.

## Conclusion

This twenty-patient case series demonstrates MaxioCel's ability to facilitate wound healing in this complex patient group. MaxioCel's versatility and multiple clinical benefits made it an easy to use and reliable dressing. MaxioCel's acceleration of the healing process was vital for this patient group, for whom delayed healing risks infection and amputation. As DFU's are known to trigger emotional distress, the benefits of timely healing for these patients extended beyond the clinical, having a positive impact on their general well-being and mental health.

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## Case Study

- 68-year-old male living with type 2 diabetes, retinopathy and neuropathy.
- Glass in foot following a fall initially unnoticed due to neuropathy.
- Wound size at initial presentation: 5cm length x 2.5cm width x 0.3cm depth.
- Tendon exposed in wound bed following amputation of the 5th toe and debridement.
- Previous treatment had included negative pressure wound therapy.
- MaxioCel managed exudate well and granulation tissue began to epithelialise.
- Over a 4-week period, a 72% reduction in wound size was seen, with wound closure achieved in 12 weeks.
- MaxioCel was continued after assessment period.
- Ease of removal and application allowed for shared care with practice nurse as required.


## Case Study

- 50-year-old male living with type 2 diabetes.
- Patient presented to his local A&E following amputation whilst away with work.
- Gangrenous left foot, leading to amputation of 2nd left toe that was previously webbed to 3rd toe.
- Initially started with pulling a bit of skin on the foot.
- Wound size at initial presentation: 12cm length x 5cm width x 1cm depth.
- Tendon visible in the wound bed when MaxioCel was commenced.
- Patient presented to clinic post operation.
- Over a 4-week period, an 87% reduction in wound size was seen, with wound closure achieved in 8 weeks.
- MaxioCel managed exudate well, encouraged and protected granulation tissue.
- Ease of removal and application allowed for shared care with nursing teams in the community.




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**References:** Diabetic foot problems: prevention and management,' NICE guideline [NG19] Last updated: 11 October 2019 www.nice.org.uk/guidance/ng19 Kerr M. *Foot care for people with diabetes: the economic case for change*. NHS Diabetes, Newcastle-upon-Tyne, 2012. Available at: http://bit.ly/ xjY7FS. Accessed March 2013. European Wound Management Association (EWMA). Position Document: Wound Bed Preparation in Practice. London: MEP Ltd, 2004. Tickle, J. A transformative wound management approach with BMG technology – final report of a national 80 patient case study series. EWMA 2023. Crocker, Rebecca M et al. "Patient perspectives on the physical, psycho-social, and financial impacts of diabetic foot ulceration and amputation." *Journal of diabetes and its complications* vol. 35,8 (2021): 107960. doi:10.1016/j.jdiacomp.2021.107960