A clinical case series: Evaluation of a Bioactive Microfibre Gelling (BMG™) dressing to support improved service delivery in the management of chronic wounds in a wound healing clinic.

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Introduction

Like many sectors tissue viability services have been affected by and had to learn lessons from the COVID-19 pandemic. The pandemic has had an impact on service delivery and patient communication and there has been some debate over whether this will permanently change the ways in which care is delivered. [1]

As a tissue viability team, we are constantly striving to improve service delivery, healing rates and positive patient outcomes. In 2021 we were introduced to a unique Bioactive Microfibre Gelling (BMG) dressing, Maxiocel® that utilises chitosan to maintain a cohesive structure to increase fluid handling, antimicrobial and wound healing properties.

Chitosan has haemostatic action due to the rapid absorption of blood plasma that leads to a concentration of erythrocytes and platelets to the site of injury, followed by platelet activation and erythrocyte coagulation[2]. It promotes re-epithelialisation by stimulating the proliferation of dermal fibroblasts and inhibiting the proliferation of keratinocytes[3]. It can also protect the skin extracellular matrix by blocking the MMP-2 expression thus aiding wound healing.[4]

Our aim was to implement an evaluation of this dressing to determine the possible impact for patients with long standing chronic non-healing wounds within our wound healing clinic.

Method

Following trust guidelines and gaining patient consent eleven patients having chronic wounds with various aetiologies and wound durations were enrolled in the evaluation. Each week, over a four week period, the wounds were assessed for; wound area reduction, type of tissue present on the wound, exudate management, peri wound skin condition and wound pain.

Dressing changes ranged from daily to weekly depending on the wound conditions.

Results

Over a 4 week evaluation period, all patients showed a significant improvement in:

- Wound parameters.
- Average tissue type at start of treatment >75% nectrotic / sloughy. Reducing to 17% by week four.
- Granulation and epithelialising tissue - from 20% on day 0 to >80% on week four.
- Exudate levels reduced from “very heavy” and heavy” to “low “ and “dry” wounds.
- Improvement in peri-wound skin from “mostly macerated” on week zero to “healthy” on week four, due to superior exudate locking ability of the dressing.

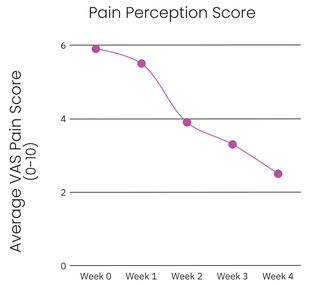
- “Complete” or “Almost healed” in 6 out of 11 patients.
- 5 in 11 patients reported “healing” wounds.

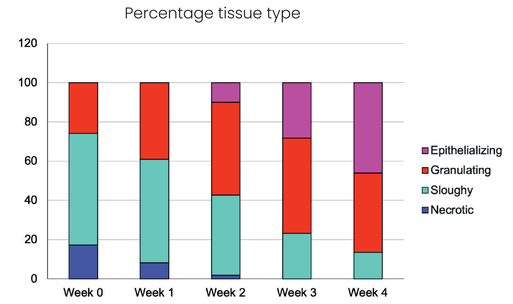
- Most interestingly, significant reduction in pain scores was reported in all patients.
- Average pain score was 5.8±2.7 at the start of the evaluation. After three weeks mean wound pain in all the patients improved significantly to 2.5±1.9.

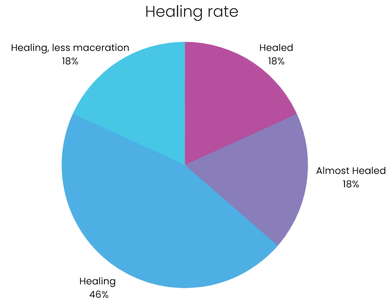
All these wounds were static or deteriorating before the initiation of the study. The phenomenal increase in granulating and epithelialising tissue was seen as soon as one week after the treatment initiation, together with improvements in periwound skin condition and level of exudate.

The overall rating of the dressing was given as “good” or “very good” for all of the following usage related parameters: - ease of understanding the instructions for use, ease of application, exudate absorption capabilities, ease of removal and ability to remove dressing in one piece.

Results Charts







Case Study 1

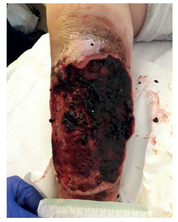
64 year old female. History of static traumatic wound to left leg, 2 week duration. Smoker, no other co-morbidities.

- Wound bed 100% necrotic with very high levels of exudate. Periwound skin dry and eczematous.
- VAS Pain level 8.

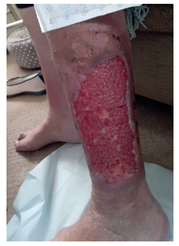
  Previous dressing superabsorbent and reduced compression. Aim to manage exudate and promote autolytic debridement.

- MaxioCel 4 week evaluation commenced. At conclusion, necrotic tissue and slough had been removed, wound had 70% granulation and 30% epithelialisation.
- Periwound skin was healthy.
- Patient pain level reduced from 8 to 3 on VAS.
- Clinicians found MaxioCel easy to apply and to remove in one piece, and were impressed with its exudate handling capabilities.

“MaxioCel assisted with reducing pain for the patient as MaxioCel could be removed easily, atraumatically and in one piece. Good haemostatic properties for this traumatic wound /haematoma.” - Clinician comment



17th November 2021



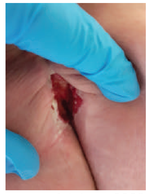
15th December 2021

Case Study 2

63 year old male, with a history of a static sacral surgical wound, of 12 weeks duration. Diabetic, no other comorbidities. On anticoagulant therapy.

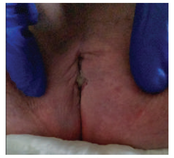
Wound dimensions **L**5cm x **W**3cm x **D**3cm. 10% slough, 90% granulation, no signs of infection, slight maceration to periwound with moderate exudate levels. Pain score of 5 on VAS.

MaxioCel 4 week evaluation commenced, with treatment aim to manage exudate, promote autolysis and granulation.



1st June 2022

Date	Wound bed condition	Exudate levels	Periwound conition	Pain levels VAS
01/06/22	80% necrosis 20% slough	Very High	Dry / Eczematous	8
22/06/22	70% granulation 30% epithelialisation	Moderate	Healthy	3



22nd June 2022

“Patients discomfort was reduced when using MaxioCel. The wound bed was successfully debrided by autolysis and granulation and epithelialisation increased within 28 days treatment of a 12 week static chronic wound. Patients quality of life was significantly improved and he could now leave the house more frequently due to the reduction in exudate volume and decrease in wound size. He felt more confident that the wound would not leak and cause him embarrassment.” - Clinician comment

Discussion

Overall, MaxioCel has shown beneficial effects in chronic non-healing wounds of surgical, venous disease, pressure, and diabetic aetiologies. The primary and secondary goals of using this bioactive microfibre gelling dressing to improve wound healing and therefore service delivery were achieved.

Conclusion

The complicated wounds seen in this study were previously non-healing and MaxioCel, with BMG technology, demonstrated significant clinical improvement within just 4 weeks resulting in its addition to our wound care formulary in October 2022.

NHS Isle of Wight Formulary

Further detail on the full case studies to be published in early 2023.

Please scan here for further information on future publication:

References: [1] Fletcher, J Atkin, L Murphy, N Murray, S Ousey, K Sandoz, H The Lessons learned from COVID-19: Building a 'new normal' in tissue viability Wounds UK | Vol 17 | No 3 | 2021 [2] M. Kabeer, P.P. Venugopalan, V.C. Subhash, Pre-hospital Hemorrhagic Control Effectiveness of Axiostat® Dressing Versus Conventional Method in Acute Hemorrhage Due to Trauma, Cureus. 11 (2019). [3] G.I. Howling, P.W. Dettmar, P.A. Goddard, F.C. Hampson, M. Dornish, E.J. Wood, The effect of chitin and chitosan on the proliferation of human skin fibroblasts and keratinocytes in vitro, Biomaterials. 22 (2001) 2959–2966.[4] E. Baena, S.R. Cunha, T. Maravić, A. Comba, F. Paganelli, G. Alessandri-Bonetti, L. Ceballos, F.R. Tay, L. Breschi, A. Mazzoni, Effect of chitosan as a cross-linker on matrix metalloproteinase activity and bond stability with different adhesive systems, Mar. Drugs. 18 (2020) 263.

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