

MULTIDISCIPLINARY APPROACH AND PRODUCT INNOVATION IN THE MANAGEMENT OF COMPLEX WOUNDS

KEY WORDS

- ▶▶ Multidisciplinary approach
- ▶▶ Hard-to-heal wounds
- ▶▶ Chronic wounds
- ▶▶ Complex comorbidities

References

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ROMMEL ORIG

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This case study explores the impact of a multidisciplinary approach when applied to a complex case — in this instance, a patient with a chronic wound and complex co-morbidities, including pyoderma gangrenosum, micro-angiopathy, diabetes and a hard-to-heal wound.

Interviews with the patient that were conducted after the wound had healed were used in order to reflect on his hospital journey and gain insights into his treatment experience. This article demonstrates that new wound product innovations such as Suprasorb X+PHMB® (polyhexamethylene biguanide) (Activa Healthcare), along with a multidisciplinary approach, can result in positive outcomes in complex hard-to-heal wounds.

BACKGROUND

Since wounds can be multifactorial, a multidisciplinary approach is essential to achieve quality outcomes for patients. As with any other diseases, chronic wounds require intervention by different teams and specialists to address the many conditions and co-morbidities that impact wound healing (Van Rijswijk, 2001).

Furthermore, since scientific findings are revolutionising medical care so rapidly, the importance of communicating with colleagues is crucial to ensure that patients are receiving timely care that follows current evidence-based practice (Wallach et al, 2002).

It is imperative that clinicians strive to improve the quality of patient care, by considering multidisciplinary management in conjunction with new wound care innovations and treatment modalities.

This case study demonstrated both the drastic consequences of failure to adopt a multidisciplinary approach and the positive outcome that can take place when clinicians get it right.

CASE STUDY

Some of the patient's own words (italicised) are used in the case study to illustrate the experience of living with a chronic wound, which could have resulted in the amputation of his hand. Patient interviews were used to explore the onset of his wound, its management, his perspective of the hospital experience, and the continuity of care post-discharge, up to the point of wound closure.

'I was doing the washing up and accidentally cut my third right finger with a knife. For some reason, it never healed properly. I went to the chemist for some advice and ended up in my GP's clinic for consultation. I passed out in the clinic and found myself in hospital with sepsis and facing the potential amputation of my finger.'

The unfortunate outcome outlined above was due to the patient's complex co-morbidities and was a result of multifactorial causes. Mr V is 44 years old and suffers with type 1 diabetes. He has microangiopathy with sub-optimal blood supply to his right arm due to vascular access steal syndrome, neuropathy, infection and pyoderma gangrenosum, for which he was on steroids. He is also receiving haemodialysis for renal failure.

The reason for delayed healing may not be solely due to Mr V's complex medical co-morbidities or any abnormality within the wound itself — it may have been exacerbated by a lack of appropriate skill and knowledge on behalf of clinicians, as well as



Figure 1: A couple of days following the initial injury (photograph supplied by patient, no accurate date available).



Figure 2: Post-amputation of index finger: managed with negative pressure wound therapy.



Figure 3: Dorsum of right hand before new dressing regimen.



Figure 4: Plantar of right hand before new dressing regimen.



Figure 5: Dorsum of right hand after application of new dressing.

a failure to use a multidisciplinary approach when it was needed. This could be due to an inability to recognise the early signs of complex wounds and consider the patient's co-morbidities, which led to delayed referral for specialist assessment and management.

In most wounds, healing progress should be visible within a four-week period (Vowden, 2011). Recognition of hard to heal wounds demands thorough reassessment of both the wound and the patient. Mr V's simple traumatic finger wound had existed for months. His associated co-morbidities and wound infection placed him in a distressing and almost life-threatening position in hospital.

'I said to the surgeon, "please save my finger as I have just started to learn playing the flute, which I really enjoyed."

The poor blood supply to Mr V's right arm led to poor vascularisation of the wound bed while his diabetes locked his wound into a self-perpetuating, inflammatory process — diabetic patients are known to experience a substantial deficit in wound healing with a marked pro-inflammatory reaction (Acosta et al, 2008). Along with wound infection and sepsis, these can severely hamper wound healing.

It is difficult to predict which wound will become clinically significant prior to the event. However, the earlier the wound healing problems are detected, the better the outcome will be for the patient (Henderson, 2006).

The simple traumatic wound to his right index finger led to Mr V's proximal interphalangeal joint (PIPJ) being amputated, which left him with a significantly sized wound that posed an even bigger challenge for the clinicians. Therefore, a multidisciplinary approach was instituted at this point. A multidisciplinary approach in the management of complex cases is now part of the 'fabric' of big organisations, such as the Queen Elizabeth Hospital in Birmingham. It was necessary in this case as the wound had become significantly larger and was non-healing. The Plastics, Dermatology, Hand Surgery and Vascular teams were all involved. Mr V commented at this point:

'I feel that I am getting the best out of everybody who sees me.'

Mr V was reviewed by all teams involved at different stages of his hospital admission. He felt reassured that he was cared for by different experts, but at the same time, confused to see no significant improvement to his wound.

'Everybody knows what they are doing, but nobody knows what to do with my wound.'

Advanced wound management products, including negative pressure wound therapy, silver and honey were used over a seven-month period in Mr V's wound, in conjunction with surgical debridement, but there was no dramatic improvement.

However, even the principles of wound bed preparation, which is now widely

accepted by wound care experts, failed to deliver the outcome that clinicians had expected.

While in the hospital, Mr V was eventually referred to the Tissue Viability team. Up to this point, ActiFormCool® (Activa), a hydrogel sheet dressing, had been used to debride the devitalised tissue. On his first assessment by the Tissue Viability team, the wound measured 9.5cm x 4.5cm to the dorsal aspect and 6.5cm x 2.5cm to the plantar aspect, with 50% devitalised tissue, 30% poor quality granulation tissue and 20% tendon that was deemed non-viable.

Mr V was apprehensive about the sudden change of team and management of his wound. Being wheelchair dependent, he was particularly anxious about the possibility of losing his hand, as this would be life changing in terms of his independence.

However, the Tissue Viability felt that a new and innovative approach to his wound management was needed and Mr V agreed to undergo treatment with Suprasorb X+PHMB.

Suprasorb X+PHMB

Suprasorb X+PHMB is a new antiseptic dressing combining Suprasorb X, a unique hydro balance dressing that is able to both absorb and donate moisture, with 0.3% PHMB, an antiseptic compound with no known cytotoxicity or resistance. PHMB is a commonly used antimicrobial that appears in a variety of products, including contact lens cleaning solutions, perioperative cleaning solutions and swimming pool cleaners.

PHMB has now been introduced into wound management and has also been shown to have positive effects on wound healing both *in vitro* and *in vivo* studies (Motta et al, 2004; Motta and Trigilia, 2005). Suprasorb X+PHMB in particular was considered in this case due to the fact that other advanced dressings had failed to heal the wound.

Due to Mr V's anxiety about the new treatment regimen, it was decided that one member of the Tissue Viability team would initially perform each wound assessment and dressing change. A series of photographs were taken at each

dressing change to keep track of any progress made.

Results

At the first dressing change, the wound was found to be very dry with no improvement. A dressing pad and bandage had been used to hold the dressing in place for three days. It was decided to use a film dressing to secure the primary layer in place, in order to improve moisture levels at the wound bed and this was left in place for three to four days.

After seven days, all dead tissue appeared moist and loose to dorsal aspect with a 0.5cm x 0.5cm reduction in wound size to the plantar aspect. The small improvement in wound size and the positive change in wound appearance led to an increase in Mr V's confidence in the new team and, subsequently, with the new product.

The patient began to take an active role in his treatment ensuring that the dressing was kept in place and was dry and clean. Suprasorb X+PHMB was easy to use and mould into the interweb spaces of the wound, allowing a more secure fit. Mr V felt it was conformable and comfortable. He could also still use his wheelchair effectively.

Mr V was happy to be discharged with district nurse support. Continued and significant wound improvement was reported by the district nurses three weeks post discharge. There was a reduction in slough and wound size, an increase in granulation tissue to wound bed and epithelialisation to wound edges.

The tissue viability team continued to liaise with the district nurses. The clinical support offered by Activa Healthcare to the district nurses provided a bridge in communication between the two teams. An Activa representative provided feedback to the hospital tissue viability nurse regarding the progress of the product trial in the community. A few weeks prior to discharge, the hand surgeon took responsibility of Mr V's case to allow hospital follow-up and provide a surgical opinion on whether reconstruction would increase the functionality of Mr V's right hand following wound closure.

'Suprasorb X+PHMB was used right up to the very end of treatment and

'The patient began to take an active role in his treatment ensuring that the dressing was kept in place and was dry and clean'



Figure 6: Plantar aspect of right hand, showing healing.



Figure 7: Wound fully healed — dorsum aspect of right hand.



Figure 8: Wound fully healed — plantar aspect of right hand.

I am very pleased that the district nurses followed the plan of care from the hospital. I may not be able to play the flute, but will still have a chance at playing the triangle as one of my friends suggested.

The long-term use of PHMB in other indications suggests that the development of cytotoxicity or antibiotic resistance is unlikely when antiseptics are used in wound management (Gilbert, 2006)

DISCUSSION

In Mr V's case, early recognition of a hard to heal wound may have prevented disastrous complications, such as sepsis. However, early signs of sepsis are difficult to identify. Whether a multidisciplinary approach in the early stages of Mr V's wound management would have provided a different outcome is debatable.

The diagnosis of microangiopathy, leading to a sub-optimal blood supply to the patient's right arm due to fistula steal syndrome and pyoderma gangrenosum to the right hand wound, was reached post-amputation of the right PIPJ. Furthermore, advances in wound care management were used to promote wound healing concomitant with wound bed preparation, although there was not a positive outcome due to his co-morbidities and wound infection.

Suprasorb X PHMB has made a significant impact in the reversible physiological causes of Mr V's chronic wound. It encourages and allows wound

size reduction and active debridement. However, its impact on pyoderma gangrenosum is unclear as concomitant treatment with steroids was begun three months prior to the application of Suprasorb X+PHMB.

CONCLUSION

Effective wound care depends on the coordinated efforts of multidisciplinary healthcare professionals. However, regular and open communication between disciplines is required, in order to identify the early signs of hard to heal wounds and to achieve positive outcomes. The patient's emotional, psychological and possible lifestyle implications of having a hard to heal wound should not be overlooked when considering innovative treatment modalities.

Based on this case study, Suprasorb X+PHMB is an advanced wound management product that effectively treats wound infection, actively debrides devitalised tissue and helps to facilitate a positive wound response.

Using this new, innovative product gave a very anxious patient, fearful of losing his hand, a renewed confidence to take part in his treatment and in the clinicians managing his care.

DECLARATION

This case study was conducted with the patient's consent. Activa Healthcare provided support for the product trial for this case study in both hospital and community settings. 