

A novel approach for lower limb ulcers – Kerraboot^R

Suzanne Butterly

Tissue Viability Research Nurse, University Hospital Birmingham NHS Foundation Trust

Ian Wilson

Head of Podiatry, University Hospital Birmingham NHS Foundation Trust

Introduction and social history

This case study presents the use of a novel wound management product used to treat pressure ulcers on a diabetic patient's foot.

Mrs H is an 81-year-old married lady who, prior to April 2004, had been relatively independent. She lived on her own, was self-caring and mobilised short distances with the aid of a zimmer frame. Mrs H had no official home help but her daughter would visit her three times a week to help as necessary. Mr H was cared for in a nursing home.

In April 2004 Mrs H was admitted to her local hospital for a total of 10 weeks with recurrent chest infections. Shortly after this she was readmitted with leg oedema, confusion and decreased mobility. After several weeks she was transferred for respite care but readmitted within days with congestive cardiac failure. (This cycle of recurrent admissions and respite continued for a total of six months).

Previous medical history includes a left femoral popliteal bypass graft in 1998 that was known to have occluded by 2002, a myocardial infarction (2004), congestive cardiac failure, atrial fibrillation and type 1 diabetes mellitus.

Treatment prior to the use of Kerraboot

Mrs H was admitted to University Hospital Birmingham NHS Foundation Trust on 1 October 2004 generally unwell. Documentation in her admission notes included confusion secondary to sepsis, constipation, dehydration, peripheral vascular disease, bilateral 'heel ulcers' and urinary incontinence requiring catheterisation. Mrs H's mental score on admission was documented at 2/10 using the augmented score or mini-mental score (MMS¹). Handover from the nursing home stated she was MRSA-positive in both her nose and her urine. It was also documented that her feet were tightly bandaged, no pulses could be felt in either foot and capillary refill time was five seconds.

Following assessment by the Tissue Viability Team a dressing regime of a hydrogel/hydrofoam combination was advised to rehydrate the eschars (Figures 1a, 1b), her Waterlow² score on admission was 30 and she was nursed on an alternating air mattress with a heel zone. Two weeks into this dressing regime a referral was made to the podiatrist for sharp debridement to speed up the healing process, and

allow fuller assessment of the wound, while removing a possible route for infection³.

The Tissue Viability Team continued to see Mrs H on a weekly basis requesting further sharp debridement from the podiatrist when necessary. The dressing regime remained unchanged. A referral was made to the vascular surgeons for advice and an angiogram in early December noted that blood supply to both legs was compromised with a long femoral occlusion to the left leg involving the whole of the femoro-popliteal segment; the dominant blood supply to the left foot came from the anterior tibial artery.

To facilitate slough removal larvae were applied to the left foot. This improved the appearance but the patient was reluctant to continue with this form of therapy.

The initial dressing regime involved the use of three separate pieces of hydrofoam overlying the hydrogel. A dressing of this type for multiple diabetic ulcers can be time-consuming and uncomfortable⁴ for the patient due to positioning. Mrs H's dressing could take two nurses up to 45 minutes to apply, which caused great discomfort due to pain at the hip when elevating the leg. When reviewed by the Tissue Viability Team, the dressing regime had minimal impact on the wound due to migration of the secondary dressing as a result of poor bandaging, thus allowing the eschars to dry out. Discussions to address this problem led the podiatrist to suggest using the Kerraboot. (Figure 2).

The Kerraboot consists of a 'boot' made of a transparent multi-layer film, with an absorbent pad in the base that absorbs exudate and a non-slip sole to assist the patient when mobilising. The transparent film of the boot allows inspection of the wound without disturbing the dressing while keeping the wounds moist and warm, promoting granulation tissue⁴. As the boot is also very simple to apply, dressing changes are quick, reducing patient discomfort and pain and also reducing nursing time⁴. With these factors in mind the option was discussed with Mrs H's consultant and the use of Kerraboot commenced on 14 December 2004, two months after Mrs H was first admitted to hospital. Two days after the initial application of the boot Mrs H's vascular surgeon recommended a below-knee amputation as he felt the leg was no longer viable. This was strongly rejected by both Mrs H and her family. Also, her medical consultant considered it was unlikely she would survive such major surgery. It was therefore agreed to continue with Kerraboot.

FIGURES 1A, 1B
After initial assessment by Tissue Viability Team



When Kerraboot was first applied to the left leg there were still some small areas of eschar present and the wounds were thick with slough. At this stage there were four ulcers present, a lateral malleolar ulcer measuring 2.5cm x 2.5cm, a heel ulcer at 7cm x 6cm, a dorsal ulcer 10cm x 6cm and a lateral border ulcer measuring 8cm x 3cm (Figures 3a, 3b).

One week after commencing Kerraboot, all the wounds showed signs of improvement. As the wounds were heavily exuding, it was recommended that the boot be changed on alternate days. Both Mrs H and the nursing staff stated that using the boot was much easier process and although she still experienced a lot of pain from her foot, it was not made worse by the dressing changes.

Three weeks into the regime all of the ulcer beds were cleaner due to the lifting of thick layers of slough and all were showing small areas of granulation tissue. New lesions had appeared on the fourth and fifth toes and a small area of eschar had developed on the first toe (Figures 4a, 4b). It was questioned as to whether this may have been caused by the shape of the boot causing pressure to the sides of the toes (Figure 5) combined with the fact that Mrs. H favoured lying on her left side. It was suggested that the toes be separated with a thin non-adherent pad in an attempt to alleviate some of the pressure on the toes. Given that she had such poor blood supply very little pressure was needed to cause further tissue damage.

The wounds responded well and were photographed on a 2-3 week basis. At week nine the malleolar ulcer had healed, as had the lateral border ulcer by the end of week 12

(Table 1). By now, although still nursed mainly in bed, plans were well under way for Mrs H to be discharged to a nursing home. She was discharged just a couple of weeks later on 23 March 2005, 23 weeks after first being admitted. On discharge the heel ulcer measured 4.5cm x 3.5cm and the dorsal ulcer was 6cm x 2cm, both wounds were healing well with large borders of epithelialisation and 100 per cent granulation tissue on the wound bed (Figures 6a, 6b, 6c). All the additional ulcers on the toes, which had caused concern initially, had now healed.

Conclusion

Due to the familiarity of existing dressing regimes, cost rarely provokes comment. However, the need to order Kerraboot as a separate item highlighted its cost, which at times became an issue despite obvious improvements to the leg. Cost does not simply involve the cost of the dressing, but nursing time and hospital stay also have to be taken into consideration⁵.

However, a comparison of the original dressings as opposed to Kerraboot identified the cost differential was negligible. The costing comparison was based on alternate day dressings over a period of a month. The hydrogel and hydrofoam regime consisted of one 20cm² and two 10cm² pieces of hydrofoam and one tube of hydrogel being used for each dressing change (excluding the cost of bandages, skin protection and nursing time), which cost approximately £220. The Kerraboot regime was based on using 15 boots and cost £225.

FIGURE 2
The Kerraboot



FIGURES 3A, 3B
Ulcers present when Kerraboot was first applied





Mrs H has now been in her new home for three weeks and her husband has been transferred from his nursing home so that they can share a double room together. She continues with the Kerraboot, which the nursing home are happy to use and her wounds continue to progress well. The dorsal ulcer has now divided into three very small areas, the largest of which is approximately 1.5cm, and the heel ulcer is 1.5cm x 2cm (Table 1).

Using Kerraboot meant that Mrs H did not have to undergo an amputation and the ulcer healed at a faster rate than expected. Patient comfort at dressing change was greatly improved and nursing staff found that what had been a complex, time-consuming process became a relatively simple procedure.

Although a single case history cannot make a definitive statement about a relatively new and novel product, it does indicate that Kerraboot has potential for certain lesions and is a product worthy of further research.

Acknowledgements

Thanks are owed to Ark Therapeutics for providing the Kerraboot at such short notice, and Dr Carol Dealey (research fellow) and the Tissue Viability Team at University Hospital Birmingham NHS Foundation Trust.

References

1. Folstein MF, Folstein SE, McHugh PR, McHugh PR. Mini mental state. A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research* 1975; 12, 189-98.
2. Waterlow J. A risk assessment card. *Nursing Times* 1985; 81(48), 49-55.
3. European Pressure Ulcer Advisory Panel. *Pressure Ulcer Treatment Guidelines*. European Pressure Ulcer Advisory Panel: Oxford, 1998.
4. Leigh R, Latif N, Hollingsworth S, Barker S, Hurel SJ. Healing of neuropathic foot ulcer using a novel wound boot (Kerraboot). *Diabetic Medicine* 2001; s2, 94.
5. Ashton J. Managing leg and foot ulcers: the role of Kerraboot. *British Journal of Community Nursing* 2004; 9, 26-30.

Received 8 July 2005, accepted for publication 12 October 2005

TABLE 1 Progress of ulcer healing				
	Initially	At six weeks	At 12 weeks	At 18 weeks
Heel ulcer	7cm x 6cm	6cm x 6cm	4.5cm x 3.5cm	1cm x 0.5cm
Dorsal ulcer	10cm x 6cm	7cm x 4cm	6cm x 2cm	2cm x 3cm overgranulation
Lateral border ulcer	8cm x 3cm	8cm x 2cm	resolved at 12 weeks	
Lateral malleolar ulcer	2.5cm x 2.5cm	2cm x 2cm	resolved at nine weeks	

