Debridement potential and outcomes of HydroClean® plus in burn wound management

Authors:
Mini Karuppan, Sister and Jacky Edwards, Burns Nurse Consultant, Burns Unit,
Manchester University NHS Foundation Trust,

Case study 1

Mrs. A was a 58-year-old lady who was referred to the burns unit, with a nine-day old contact burn injury from a metal heater to the calf of her left leg. Mrs. A did not meet the criteria for grafting due to her significant co-morbidities. Consequently, conservative treatment with HydroClean® plus was recommended and initiated with consent. On wound assessment, a 0.4% total body surface area burn (TBSA) was identified, which was a full thickness burn with fixed slough (Figure.3).Mrs. A was seen in the outpatient clinic on a weekly basis, where digital photographs and feedback evaluations were carried out. The wound was primarily treated with Hydroclean® plus and changed every 3 days. Following initial treatment period of 3 weeks, slough had softened (Figure.4). Concomitant images revealed the burn wound progress (Figure.5) and reduced slough and early granulation revealed in 8 weeks (Figure.6). Overall Mrs. A was generally happy with the dressing performance and liked the dressing as it was comfortable to wear and had no concerns of increased pain. Due to Mrs. A's co-morbidities assistance with dressing was carried out by the district nurses. The total debridement process lasted 8 weeks with a positive outcome and a good evidence of healing. Mrs. A was successfully treated as an outpatient.

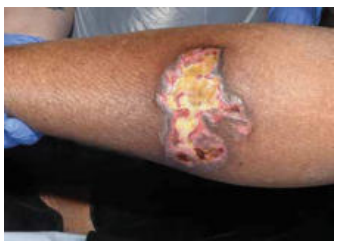

Figure 3. 4.2.19
Initial wound assessment

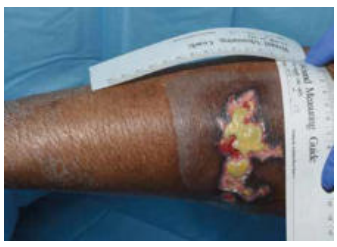

Figure 4. 25.2.19
3 weeks of HydroClean® plus

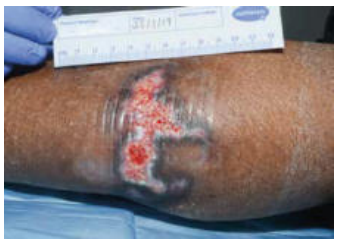

Figure 5. 25.3.19
Wound progress in 4 weeks

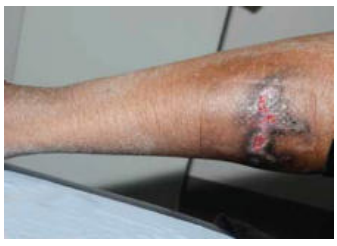

Figure 6. 8.4.19
Wound granulation observed at 8 weeks

Case study 2

Mr. D was a 60-year-old who sustained a chemical burn, whilst working on his knees with concrete with no protective clothing. Mr. D was admitted to the burns unit with a TBSA of 4% to bilateral knees. The burn areas comprised of deep dermal to full thickness with eschar present (Figure.7). He was considered for surgery, but was initially treated conservatively with HydroClean® plus with a view to surgery once debrided. Figure.8 and Figure.9, illustrate progressive wound healing after a week. Figure.10 and Figure.11 reveal the improvement of the wound on week three of dressing initiation. The total time frame from application to debridement was three weeks. Mr. D was an inpatient for 3 weeks, with intermittent home leave and discharged successfully with regular outpatient follow up. Surgical intervention not required, as the wound improved and progressed to heal. Mr. D reviewed as an outpatient at 12 weeks Figure.12 and Figure.13, where the burn wound showed good evidence of healing and no evidence of hypertrophic scarring. Mr. D reported minimal pain and was happy that his mobility was not compromised. Mr. D remained compliant with the treatment and was extremely happy with the dressing and the outcome. Staff commented that due to the burn location, dressing size and slippage was a concern. But this was managed with the use of burns gauze and extra bandaging to keep the dressing in situ. This in turn helped secure the dressing whilst mobilising.

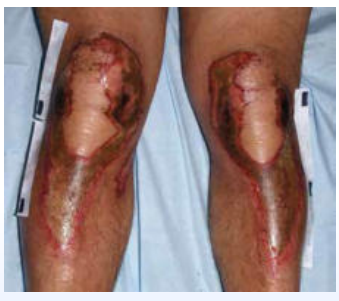

Figure 7. 16.1.19
Initial wound assessment

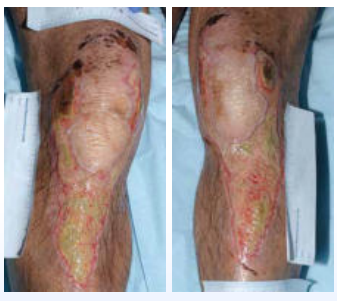

Figure 8. 24.1.19
A week of using HydroClean® plus

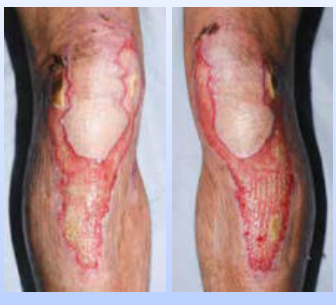

Figure 9. 30.1.19
Wound debridement in 3 weeks

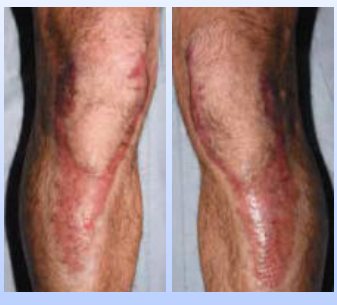

Figure 10. 9.4.19
Wound review at 12 weeks

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Introduction

Clinical assessment of accurate burn depth forms a substantial component in influencing a patient's treatment modality and healing potential. In most cases, deep burn injuries require early mode of invasive intervention to promote timely healing with minimal scarring (Devgan et al, 2006). A vital part of burn wound care is wound bed preparation, assessment and the removal of devitalised tissue by debridement. The devitalised tissue present in the wound bed increases the likelihood for wound infection and delays healing. Surgical intervention is the most effective method of wound debridement; however, some patients refuse surgery whilst others are unfit for surgical intervention, due to their co-morbidities. With fixed necrotic tissue that is thicker and harder to remove, sharp mechanical debridement becomes more difficult. Consequently, conservative treatment by autolytic debridement is often the option; nevertheless, this can take several weeks to accomplish healing.

The primary goal of any type of debridement is to reduce bacteria, cleanse wound and create a suitable moist wound bed to promote healing. Sibbald et al (2015) recognised that a moist wound environment augments the healing process compared to inadequate moisture. Moist dressings have no adverse effects on the wound bed and surrounding skin. Burn wounds require a dressing product that maintains a moist healing wound bed. Therefore, the preferred product should have no or low risk of maceration and skin stripping, reduce the frequency of dressing changes and be able to be used on fragile and vulnerable skin (Benbow, 2010).

HydroClean® plus is a Hydro-Responsive Wound Dressing (HRWD™) containing components to cleanse, debride, deslough and absorption, thereby facilitating optimal wound bed preparation. Ringer's solution in the product aids the wound by providing moisture, softens devitalised tissues and absorbs excess wound exudate. It also absorbs and retains bacteria within the core matrix of the dressing containing PHMB. Consequently, this mechanism of continuous rinsing and absorbing within the wound bed, provides an optimal wound healing environment (HARTMANN, Info).

Method

This clinical evaluation involved 13 patients treated with HydroClean® plus on 17 deep sloughy burns. In this evaluation, every burn was assessed and counted as a single burn wound (see Table1). Of the 13 patients, 10 patients presented with acute or delayed burns with mixed d conservatively with the dressing. The 17 wounds were included in the evaluation with a minimum of 3 dressing changes. Following consent, the burn wound was assessed and photographed once a week and all relevant data was recorded on a weekly basis using a 10-point Likert scale (1 being poor and 10 being excellent). Overall comments from staff and patient were noted. Evaluation criteria which included debridement action, pain (1= no pain and 10= worst pain), product conformability, exudate control, odour, trauma to wound bed and periwound skin trauma were also documented

	Range	Mean
Patient age (years)	20 – 83 years	46.5
TBSA (%) MD -FT	0.2% -3%	1.4%
Male: Female ratio	8:5	

Table 1. Patient demographics

Results

Key findings were the dressing was easy to apply and dressing changes were possible every 3 days compared to our standard 2 days. Moreover, patients were satisfied with the product because of reduced frequency of dressing changes. Minimal pain was reported by patients on dressing application. There were slight concerns of stinging and itchiness whilst the dressing was in situ, but not more than our normal dressings (Fig.1). Clinical evaluation findings have demonstrated a promising debriding action on both new and chronic burn wounds, with debridement times achieved by the second to third dressing change review (Fig. 2.).

As HydroClean® plus was essentially a wet dressing, it lifted off the wound bed without causing trauma and pain. Also, HydroClean® plus was comfortable and there were no signs of maceration or evidence of skin stripping from the dressing as established in Fig.2. Staff commented on the limited dressing size and conformability. They also addressed that the dressing slippage appeared to be a concern depending on the burn location (as represented in Fig.2). Our findings reveal that it does not conform a well to contoured surfaces of the body and varied dressing sizes would make it more practical

Discussion and Conclusion

Both these case studies have demonstrated that HydroClean® plus is a useful addition to our burn wound management. HydroClean® plus facilitated quicker debridement times in deep burn wounds, which ultimately led to faster healing rates. It has demonstrated a reduction in pain application and removal. Staff found the dressing easy to apply and observed no concerns of trauma to the wound bed and no evidence of maceration or surrounding skin trauma. Minor issues identified by staff and patients, were that the dressing size was limited, and conformability was restricted; hence, slippage appeared to be a problem. Dressing slippage was resolved by securing the dressing with a bandage/ tubifast/ sleeve depending on the location of the burn. One patient complained of increased pain, malodour, and evaluation was stopped, and the patient commenced on an antimicrobial dressing.

Whilst there is limited previous evidence of the use of this product in burn wounds, it is felt that the time taken for the debriding action seems favourable and effective in treating new and chronic burns.

Clinical staff recommended the use of this dressing for debridement of deeper burns. It also has proven to be a potential for use as a conservative management when surgical intervention cannot be performed. Prospective clinical evaluation studies are in place to establish this specific aspect.

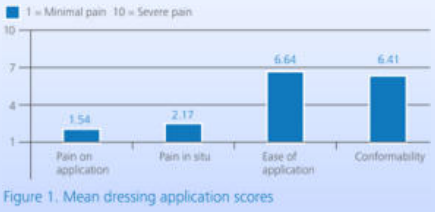

Figure 1. Mean dressing application scores

Figure 2. Mean dressing removal scores