Self-adaptive wound dressing in managing complex pressure ulcers

Authors:
Abdulkarem Iblasi, Dr Hussam Itani

This article discusses use of a self-adaptive wound dressing (SAWD) for the management of a complicated pressure ulcer. The primary objective of this study was to observe patients' wound progression in terms of wound size and condition of the wound bed when using SAWD as a primary dressing. The evaluation demonstrated that Enluxtra effectively managed exudate, assisted in slough autolysis, decreased bacterial burden, and supported granulation in the wound tunnel and epithelialisation of the periwound skin.

In cutaneous wound healing, wounds are usually classified into two broad categories: acute and chronic (Diegelmann and Evans, 2004). Wounds that heal in a complex series of interlinked and overlapping but well-defined and timely mannered phases are classified as acute wounds (Schultz et al, 2003). Conversely, chronic wounds are those that are 'hard-to-heal' or have failed to heal with 'standard therapy' in an orderly and timely manner or that have persisted for over 4 weeks or over 6 weeks (Fletcher, 2008; Markova and Mostow, 2012).

Chronic wounds, which are not limited to pressure ulcers, but include diabetic foot ulcers, arterial ulcers and venous leg ulcers, represent a significant burden to patients, healthcare professionals and healthcare systems, and cost billions of US dollars annually (Frykberg and Banks, 2015). Considering that dressings are fundamental to wound management, it is imperative that wound care specialists choose appropriate dressings based on the wound's aetiology, type and wound bed condition (Dabiri et al, 2016).

Wound dressings play a crucial role by protecting the affected area from external aggressors such as bacteria and bodily fluids and, ideally, create a moist, warm, wound healing environment. Good exudate handling properties are also essential to support wound healing (Dabiri et al, 2016). One dressing category that many clinicians turn to is the foam dressing. Polyurethane foams dressings, which were introduced in the mid 1980s, continue to be important in wound management, particularly where exudate levels are challenging (Abdelrahman and Newton, 2011).

Despite their wide usage, the limited exudate absorption and fluid retaining abilities of foam dressings mean frequent dressing changes are required when they are used over highly exuding wounds. Otherwise, the foam dressing will become saturated with exudate and cause maceration of the surrounding skin (Dhivya, 2015; Dabiri et al, 2016). Additionally, foam dressings are not suitable for dry wounds and scars as the wound bed may desiccate if there is no exudate. For that reason, foam dressings are contraindicated for use for third-degree burns, dry eschar and sinus tracts (Dhivya, 2015; Dabiri et al, 2016).

Recently, SAWD technology (Enluxtra, OSNovative Systems Inc, Santa Clara, CA) has been introduced as a management option for chronic wounds. SAWD is the first and only self-regulating superabsorbent synthetic polymer dressing with adaptive absorbency and a built-in adaptive hydration function. When SAWD is in direct contact with the wound bed, it can sense the underlying tissue's physical condition and adapts its local function to provide optimal treatment simultaneously for different wound zones. SAWD vertically absorbs exudate in exuding wound zones, while hydrating dry wound zones, and moving slough, necrotic tissue, debris and harmful bacteria away from the wound. Since the introduction of SAWD in 2015, hundreds of patients with various chronic wounds (pressure ulcers, diabetic foot ulcers, traumatic wounds and post-operative complicated wounds) have benefited from the technology. This paper reports on a challenging Grade 3 pressure ulcer with tunneling that was fully treated with SAWD.

Abdulkarem Iblasi *is Clinical Nurse Manager, Wound Care King Saud Medical City, Riyadh, Saudi Arabia and* ***Dr Hussam Eddine Saleh Itani*** *MD MSc is Wound Healing and Tissue Repair Wound Care Specialist in Canada and UAE*

Case study
A 74-year-old male patient, with diagnosis of cerebrovascular accident (CVA) in the last 3 months and history of diabetes mellitus (15 years), was admitted to the acute care hospital for investigation on 27 August 2015. He was semi-conscious with a GCS of 12 and a Braden score of 12. On 15 December 2015, the patient was referred to the wound care division with a Grade 3 pressure ulcer with tunneling on the right side of his back *[Figures 1 and 2]*.

Treatment objectives
To provide proper wound treatment and prevent further complications.

Wound assessment
The wound was located on the right side of the patient's back between the fifth and seventh intercostal areas in the thoracic region. It was 4 cm in length and 3 cm in width, with a tunnel that was 4 cm in depth. Wound bed and tunnel covered with thin layer of slough, serosanguinous exudate (mid to high). A wound swab showed presence of Staphylococcus aureus with moderate growth.

Treatment
Treatment started on the 15 December 2015, as follows:

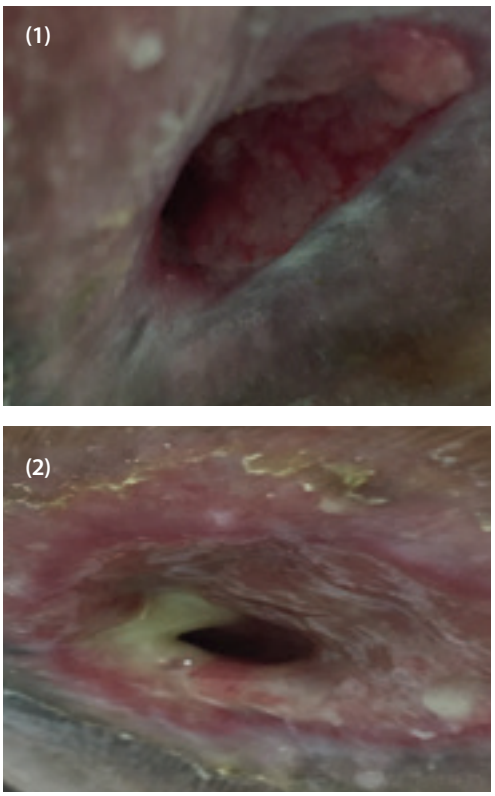


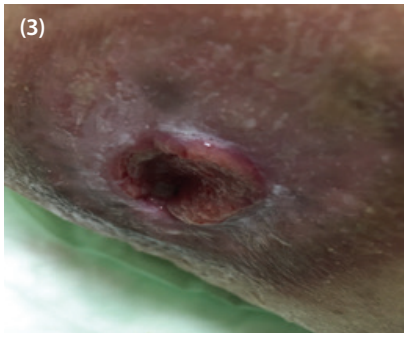
Figure 1 and 2. The wound on 15 December 2015

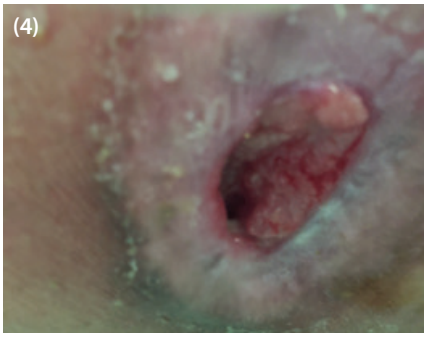
Wound bed preparation	Primary dressing	Secondary dressing	Frequency of change
Ulcer Cleansing System	SAWD	Transparent dressing	48 hours

First review
The first dressing change was performed on 17 December 2015. The wound showed positive progress in term of healthy granulation tissue, slough tissue still present in the tunnel. Minimal serosanguinous exudate level, no clinical signs of infection. There was no significant change to the tunnel depth *[Figures 3, 4, 5]*.

Treatment recommendation			
Wound bed preparation	Primary dressing	Secondary dressing	Frequency of change
Ulcer Cleansing System	SAWD cut to fit inside the tunnel, with silver dressing inside the tunnel	Adhesive transparent dressing	72 hours

Figure 3,4 and 5. The wound in 17 December 2015





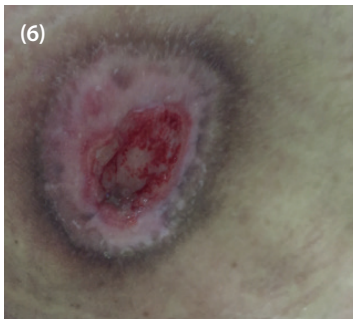


Figure 6. The wound on 20 December 2015

Figure 7. The wound on 23 December 2015

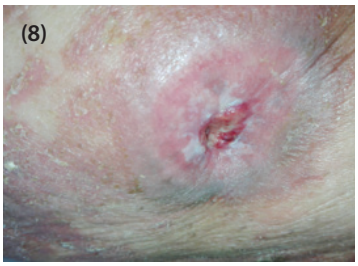


Figure 8. The wound on 3 January 2016

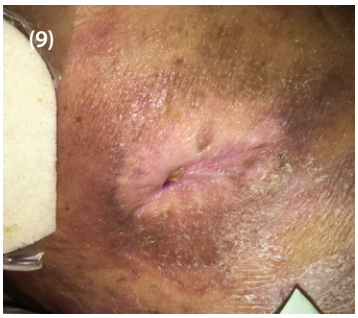


Figure 9. The wound in 6 January 2016

Second review

On 20 December 2015, the wound had decreased in size by more than 50%, showing a fast response to the treatment *[Figure 6]*. Healthy Granulation tissue layer over the wound bed and the tunnel. Signs of epithelial migration from wound edges. Wound swab showed none significant growth.

Treatment recommendation			
Wound bed preparation	Primary dressing	Secondary dressing	Frequency of change
Ulcer Cleansing System	Pack tunnel with SAWD and cover with another SAWD	Adhesive	72 hours

Third review

On 23 December 2015, 75% of the wound bed covered with epithelial layer and 25% healthy granulation issue. Wound became superficial with no tunneling *[Figure 7]*.

Treatment recommendation			
Wound bed preparation	Primary dressing	Secondary dressing	Frequency of change
Ulcer Cleansing System	SAWD	Adhesive	One week

Fourth review

On 29 December 2015, the wound measured less than 1 cm x 1 cm with healthy epithelialization at the wound edges healthy granulating wound bed. The patient was discharged from the wound care division on 3 January 2016 with the recommendation to continue using SAWD along with pressure ulcer preventative measures *[Figure 8]*.

Follow-up

At a follow-up on 6 January 2016, the wound had completely healed *[Figure 9]*.

Conclusion

In summary, SAWD performed well at removing of excess exudate, slough, and microbial bioburden, as well as promoting granulation tissue formation and epithelization. Achieving complete healing of a complicated Grade 3 pressure ulcer (with tunneling) within 22 days with use of SAWD is a promising step toward healing of chronic wounds and warrants further study. WME

References

Abdelrahman T, Newton H (2011) Wound dressings: principles and practice. *Surgery Journal* 29(10): 491–95

Dabiri G, Damstetter E, Phillip T (2016) Choosing a wound dressing based on common wound characteristics. *Adv Wound Care* 5(1): 32–41

Diegelmann RF, Evans MC (2004) Wound healing: an overview of acute, fibrotic and delayed healing. *Front Biosci* 9(1): 283–9

Dhivya S, Padma VV, Santhini E(2015) Wound dressings – a review. *BioMedicine* 5(4): 24–8

Fletcher J (2008) Differences between acute and chronic wounds and the role of wound bed preparation. *Nursing Standard* 22(24): 62–8

Frykberg RG, Banks J (2015) Challenges in the treatment of chronic wounds. *Advances in Wound Care* 4(9): 560–82

Markova A, Mostow EN (2012) US skin disease assessment: ulcer and wound care. *Dermatol Clin* 30(1): 107–11

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance (2014) *Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline.* Emily Haesler (ed.) Cambridge Media, Perth, Australia

Schultz GS, Sibbald RG, Falanga V et al (2003) Wound bed preparation: a systematic approach to wound management. *Wound Repair Regen* 11(Suppl 1): S1–28