A Comparison of a Gentle, Absorbent Silicone Foam Wound Dressing with Two Market Leading Products in Terms of Fluid Absorption and Peel Force

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Introduction

Effective management of wound exudate is essential to create the optimal environment for wound healing and to prevent maceration of the surrounding skin[1]. For the treatment of chronic wounds, wound dressings need to perform under compression and also need to be easily removed. This allows for minimal pain and can prevent damage to new epithelial cells[2]. Pain and trauma during removal of a dressing can cause delayed healing and be distressing for the patient[3]. Wound dressings that can effectively manage wound exudate and be easily removed can improve patient experience.

Aims

- To investigate the free swell capacity of Product K* and two market leading products.
- To investigate the fluid absorption capabilities whilst under compression of Product K and two market leading products.
- To determine the amount of force required to peel Product K and two market leading products from porcine skin explants under dry and exuding wound conditions.

Methodology

1. Free swell absorption was measured according to methods adapted from EN 13726[4].
2. Absorption under compression was assessed using a mass equivalent to 40 mmHg using methods adapted from EN 13726[4].
3. The peak force required to remove dressings from porcine skin explants was measured. Dressings were adhered to 100 cm^2 porcine skin explants. Following a 30 minute contact time, the dressing was removed using a digital peak force meter. The peak force required for dressing removal was recorded.
4. The peak force required to remove dressings from porcine skin explants following an introduction of fluid, was also measured. Dressings were adhered to 100 cm^2 explants and incubated overnight. Each day, 2 ml of phosphate buffered saline (PBS) was injected through the underside of the explant in order to mimic an exuding wound (Figure 1). Dressings were removed at 24, 48 and 72 hours using the digital force meter.

Figure 1. A photograph demonstrating phosphate buffered saline being injected into a porcine skin explant prior to peel force assessment.

Results

The average free swell absorption and absorption under compression were comparable for Product K and Market leader B. Market leader A absorbed and retained a greater volume of fluid than Product K or Market leader B (Table 1, Figure 2).

Parameter	Average Solution A absorbed (ml)		
	Product K	**Market leader A**	**Market leader B**
Average free swell absorption	9.44	13.17	7.96
Average absorption under compression	8.80	11.29	8.15

Table 1. Average free swell absorption and absorption under compression of three wound dressings.

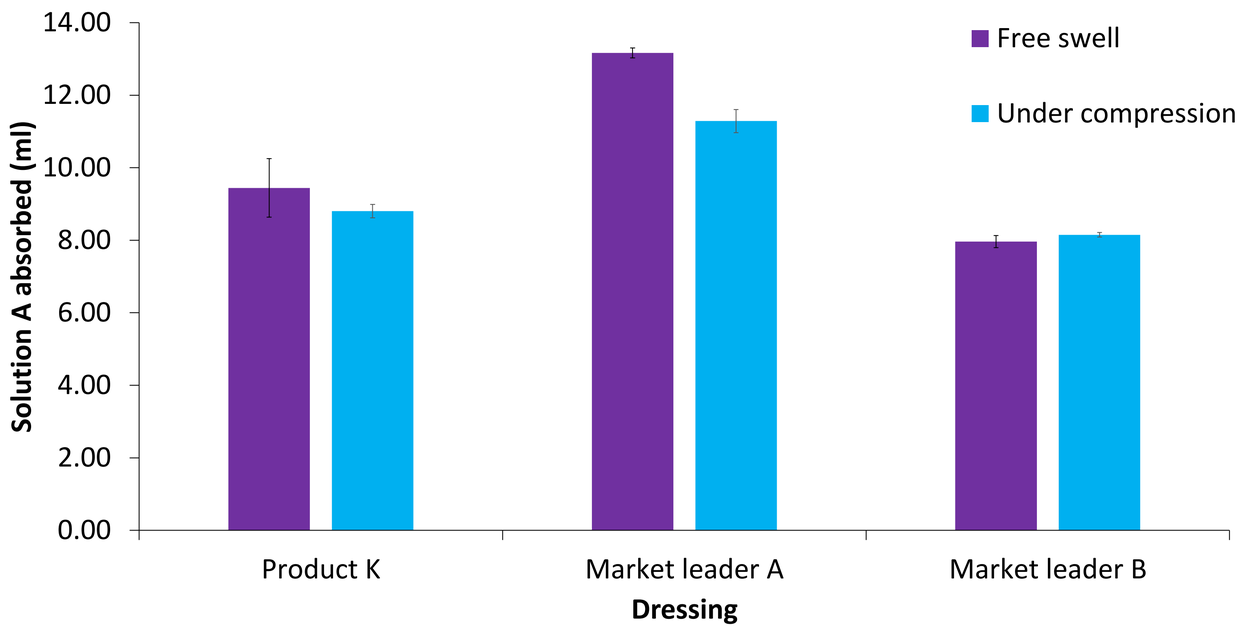

Figure 2. Average free swell absorption and absorption under compression of three wound dressings.

The average peak force required to remove wet and dry dressings from porcine skin explants was comparable for all dressings regardless of the model used; approximately three newtons of force was required to peel each dressing from the porcine skin. This was observed for both the dry and wet porcine models.

Discussion and conclusions

Product K demonstrated equivalence to Market leader B in terms of free swell absorption and fluid absorption under compression. The active area of Product K was smaller than the two market leading dressings suggesting a potentially greater performance per cm^2. Market leader A outperformed Product K and Market leader B in terms of the amount of fluid absorbed in each test condition.

The three test dressings demonstrated equivalence in terms of the amount of force required to remove the dressings from a porcine skin explant. The daily addition of 2 ml PBS did not have a significant effect on the force required to remove the wound dressings.

References

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* Product K - Kliniderm Foam Silicone. Market leader A - Foam dressing with proprietary adhesive. Market leader B - Foam dressing with silicone gel adhesive.

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