KICK-START STALLED WOUNDS: CASE SERIES EVALUATING AN INNOVATIVE FLUID DELIVERY SYSTEM FOR WOUND HEALING

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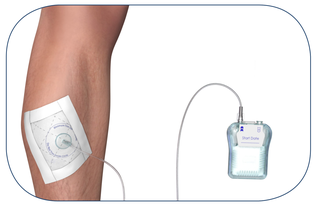
BACKGROUND

For nearly a half-century the benefits of moist wound healing have been compared with dry techniques.[1] Research through the years has continued to support moist wound healing as the gold standard in wound treatment. "Dyson et al. (1992) reported that the inflammatory and proliferative phases of wound healing were shortened by use of moist wound healing as opposed to dry conditions. They also showed revascularization occurred at a faster rate and in a more orderly manner in wounds managed in a moist environment.[2] Subsequent research supports the concept that wounds managed in a moist environment heal faster with less pain, fewer infections and less scarring."[3]

METHOD



We conducted a non-randomized trial on a new device designed to provide a moist wound environment through the continuous introduction of a small volume of topical solution. The System includes an innovative pocket sized Fluid Delivery Device connected to a semi-occlusive dressing with small tubing. Below are the results of three of the 15 patients who received a total of 57 procedures.

RESULTS

Patient's phases of wounded healing were shortened by use of the moist wound healing treatment. The following patient examples illustrate the results of 15 patients who received a total of 57 procedures. In the study 14 of the 15 patients showed improved healing.

PATIENT 1

26 year old female (with venous stasis disease and morbid obesity) had a traumatic injury to her right shin (falling while ascending a staircase and striking her shin on a stair). This injury caused swelling to the leg and drainage from a skin tear at the site of the injury. The skin tear developed into an open wound with a tunnel (measuring 1.95 cm^2 and a depth of 1 cm). Treatment consisted of packing the wound tunnel with silver impregnated collagen with application of the Delivery Dressing and the Fluid Delivery Device delivering a small amount of sterile water to the wound. After an initial increase in size with standard wound care, the device was applied and the tract decreased in size by 0.22 cm^2/day and healed completely in 3 weeks *(figure 1)*.

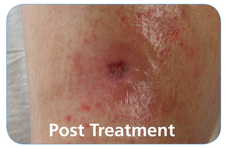
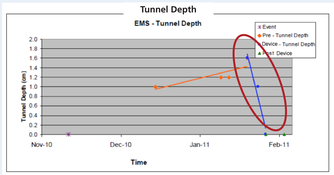
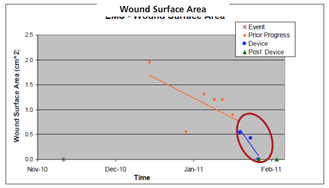


FIGURE 1: RATE OF WOUND HEALING



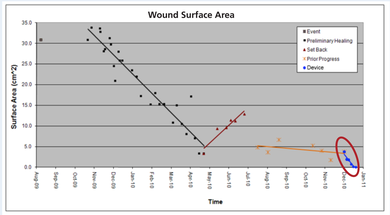


Description	Duration	EMS Rate of Wound Healing	
Event	11/15/2010		
Prior Progress	12/16/10 - 1/20/11 5.2 weeks	0.01 cm increase in tunnel length per day	0.03 cm^2 reduction in wound size per day
Device	1/20/11 - 1/27/11 1.2 weeks	0.22 cm decrease in tunnel length per day to closure	0.07 cm^2 reduction in wound size per day
Post Progress	1/27/11 - 2/03/11 1.2 weeks		Wound closure

PATIENT 2

47 year old diabetic male: laparoscopic repair of a ventral hernia, which dehisced leaving a chronic, non-healing open wound. Preliminary healing was followed by a setback (increase in size of the wound of 0.14 cm^2/day for 9 weeks). The wound stalled for 19.6 weeks with a 0.01 cm^2/day decrease. The new System was applied instilling a 0.3% gentamicin solution. The wound then showed a decrease in size of 0.2 cm^2/day and closed completely in 2.6 weeks *(figure 2)*.

FIGURE 2: RATE OF WOUND HEALING

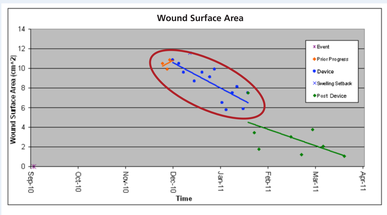


Description	Duration	BB Rate of Wound Healing
Preliminary healing	10-29/09 - 4/28/10 26 weeks	0.16 cm^2 reduction in wound size per day
Set back	4/28/10 - 6/30/10 9.2 weeks	0.14 cm^2 increase in wound size per day
Prior progress	7/21/10 - 12/3/10 19.6 weeks	0.01 cm^2 reduction in wound size per day
Device	12/3/10 - 12/21/10 2.6 weeks	0.20 cm^2 reduction in wound size per day to closure

PATIENT 3

50 year old male (comorbidities include: diabetes, obesity, edema and peripheral neuropathy) had a non-healing ulcer on his left medial calf. The new device and dressing were applied using a 0.3% gentamicin solution. The wound decreased in size at a rate of 0.08 cm^2/day over the next 7.2 weeks. The device was removed with wound closure 9.2 weeks later *(figure 3)*.

FIGURE 3: RATE OF WOUND HEALING



Description	Duration	BG Rate of Wound Healing
Event	Stated as 9/1/10	----------
Preliminary Progress	11/26/10 - 12/03/10 1.2 weeks	0.08 cm^2 increase in wound size per day
Device	12/03/10 - 1/21/11 7.2 weeks	0.08 cm^2 reduction in wound size per day
Post Progress	1/21/11 - 3/25/11 9.2 weeks	0.05 cm^2 reduction in wound size per day

REFERENCES

1. Winter, G. (1962) Formation of the Scab and the Rate of Epithelisation of Superficial Wounds in the Skin of the Young Domestic Pig. Nature 193, 293-294.
2. Dyson, M, Young, SR, Hart, J et al. (1992). Comparison of the effects of moist and dry conditions on the process of angiogenesis during dermal repair. Journal of Investigative Dermatology, 99, 729.
3. Doughty, DB & McNichol, LL (Eds.). (2016). Wound Ostomy, and Continence Nurses Society Core Curriculum Wound Management. Philadelphia, PA: Wolters Kluwer. Page 112-114.

CONCLUSION

This new moist healing treatment System, that continuously instills a small volume of solution, shows promise of improved healing rates. Further studies are needed to determine if improved healing rates are due to maintaining a moist environment or to the effects of a continuous addition of an active topical solution.

Product information: the Acton Topical Delivery System is a product of Aplion Medical Corporation. Salt Lake City, Utah