Evidence in focus

Publication summary

Hirokawa E, et al. *J Wound Care* (2019)*

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VERSAJET® Hydrosurgery System achieved significantly faster debridement and wound healing compared with surgical debridement in a rat model of thermal burns

Injury to healthy tissue was reduced with use of the VERSAJET System versus surgical debridement

Study overview

- An animal study comparing debridement of thermal burn wounds using the VERSAJET System or surgical debridement
- Grade II thermal burns (2cm in diameter) were created on the backs of 23 male Wistar rats (two burns per rat; 46 wounds)
- The day after thermal injury, one burn on each rat was debrided surgically and the other with the VERSAJET System; a calcium alginate dressing was then applied to each wound until haemostasis was achieved
- Wound surface area was measured at days 2, 4, 7 and 9 after debridement (15 rats, 30 wounds), and full thickness skin wound specimens were obtained for histopathologic examination on day 4 (8 rats, 16 wounds)

Key results

- Compared with surgical debridement, the VERSAJET System significantly reduced:
  - Time to debride wounds by 61% (75 vs 190sec, p<0.01)
  - Blood loss after debridement (6.9 vs 20.1mg, p<0.01)
  - Time to wound healing by 2 days (Figure)
  - Wound size at days 2, 4 and 7 after debridement (p<0.01, p<0.05, and p<0.05, respectively), although wound size was similar with both methods after 9 days (p=0.061)
- Compared with surgical debridement, after 4 days:
  - Markers of damage to tissue (inflammation in the submuscular tissue and reactive fibrosis at the wound surface) were significantly lower with the VERSAJET System (p=0.017 and p<0.001, respectively)
  - Tissue healing markers increased with the VERSAJET System (p<0.001)

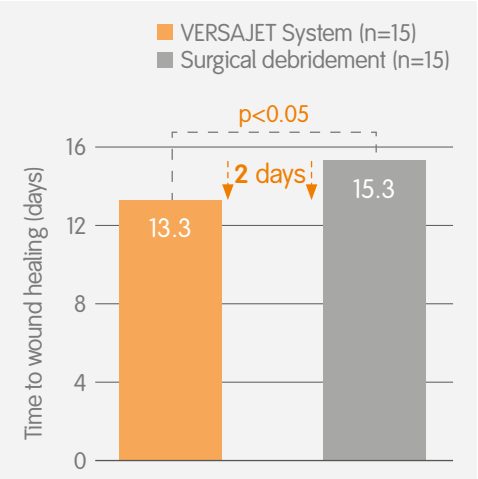

Figure. Mean number of days to wound healing

Conclusion

In this thermal burn model, debridement with the VERSAJET System was less invasive and quicker than surgical debridement. Use of the VERSAJET System appeared to minimise injury to healthy tissue and ameliorate inflammation, which may promote early wound healing and help to reduce scar contracture.

Considerations

- Pathophysiology and histology of rat burn wounds differ from human burn wounds
- Rat dorsal skin is relatively hard, which makes shallow surgical debridement difficult; therefore, surgical debridement was expected to result in more bleeding than use of the VERSAJET System

Study citation

*Hirokawa E, Sato T, Fujino T, Gotoh Y, Yokogawa H, Ichioka S. Hydrosurgical debridement as an approach to wound healing: an animal thermal burn model. *J Wound Care*. 2019;28(5):304–311.

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For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

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