


Periwound Maceration Is Strongly Associated with Poor Healing of Venous Leg Ulcers and May Be Treated Effectively Using Liquid Cyanoacrylate Protectant*

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INTRODUCTION

While the status of venous leg ulcer (VLU) periwound skin is typically noted during wound evaluation, its significance has not been widely appreciated. We have accumulated anecdotal experience that would suggest that maceration of the skin around a wound may be an indication of worsening wound status and can predict poor healing. The present retrospective review was conducted to probe further into this association.

METHODS

Our electronic medical record (EMR) system+ was used to identify all 13,880 outpatient visits to the Overlook Hospital Wound Healing Program from June, 2006 through June, 2009. The EMR menu includes a field in the wound evaluation page that queries for the presence of wound maceration. Wound evaluations in which maceration was noted by the nurse or the physician (in the progress note), were encoded as "M" other visits were encoded "O." Statistical measures were used to pose various hypotheses related to the possible relationship between wound edge maceration and healing outcomes.

RESULTS

The database included 2,220 wounds of various etiologies, involving 832 patients. In 4,708 (33.9%) of wound evaluations the edges of the lesion were noted to be macerated. There were 1,332 VLU which became the focus of the current study.

VLU that were seen during 8 or more weekly clinic visits were identified; 35 who had periwound maceration noted during 4 or more visits were compared with 35 matched controls who demonstrated maceration on 0-3 visits. The group with more frequent maceration healed substantially more slowly (mean 4.8 months and median 4.25 months, respectively vs. 2.1 months and 2.0 months for control; $p=0.0002$ by two-tailed Student t -test.) Further, 6 of the 35 macerated wounds failed to heal by 18 months, compared with 1 of the 35 controls ($p=0.046$ by chi-squared analysis.)

A table was created, stratifying wounds that required either greater or less than 6 visits to heal, and wounds noted to be macerated more or less than 30% of visits:

Clinic visits required to heal		Maceration noted (# of visits)	
		>30%	<=30%
>6 visits		319	357
<=6 visits		214	442

There was a strong negative correlation of wound edge maceration and the incidence of prompt healing ($p<0.0001$ by chi-squared analysis.)

Prevention and treatment of maceration: No studies have proven conclusively that any particular dressing diminishes wound maceration compared with other dressings. The primary approach to prevention and treatment of maceration is the use of skin protectants. In our recent experience we have had excellent success with liquid cyanoacrylate protectant particularly in situations where the patient or the wound is only available once weekly and an optimal, long-lasting protectant is required.

CONCLUSION

We have demonstrated a powerful association of peri-wound maceration with delayed or non-healing of VLU. This association may occur because heavy exudate, causing maceration, can reflect poorly controlled congestive heart failure or occult wound infection. Additionally, high levels of destructive matrix metalloproteinases (MMPs) which are found in poorly healing chronic wounds may be damaging to the skin edges.

It is possible that diligent skin protection may facilitate not only prevention of skin maceration but faster wound closure because the tendency of heavily exuding venous wounds to enlarge may be counteracted. We have found that liquid cyanoacrylate protectant is a highly effective skin protectant, and the one most suited to application under compression dressings that are changed weekly.

SUMMARY

This retrospective chart review shows that there is a likely co-relation between poor periwound skin health and wound chronicity. In general, wounds that remain macerated for prolonged periods were also open for prolonged periods. The reverse was also true, wounds that had less periwound maceration, were likely to heal faster.

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Examples of macerated wound edges treated in our clinic.



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