IMAGES

Clinical Images

This climber presented to the author at 4300 meters (about 14 000 feet) on Denali (Mt McKinley) with a large laceration sustained about an hour earlier while

descending the fixed lines from 5000 m (16 400 feet) (Figure 1). How did the wound occur? How would you treat it?

Figure 1. Climber's leg at Ranger Camp, 4300 meters, Denali National Park, Alaska. Photograph copyright 1997, Ken Zafren, MD.

Answer

WOUND CARE IN THE WILDERNESS

The climber lacerated her leg with a point of a crampon worn on her other foot. Crampons are of great advantage in moving over hard snow and ice, but a disadvantage is that they offer many sharp points that can damage clothing and skin, especially on the medial aspect of the contralateral leg. This climber and her party had controlled the bleeding and placed a pressure dressing at the site of the injury and then presented to the Denali National Park Mountaineering Rangers' camp at 4300 meters, where I examined and treated her.

While some authors believe that "[i]n the wilderness the risk of infection precludes suture closure,"¹ I disagree. There are many circumstances in which sutures or staples are appropriate for laceration repair in backcountry settings. In my own practice in Alaska, I sometimes encounter patients whose wounds were sutured in the wilderness by themselves or by other members of their party not trained in suture repair. While most of these wounds would have been better managed by delayed primary closure or by tape, I have yet to see a serious wound infection resulting from this practice. However, I recommend that anyone who does not regularly repair wounds in the nonwilderness setting not suture wounds in the wilderness.

The principles of wound care in the backcountry are the same as those in the clinic or hospital setting. Control of bleeding, decontamination, and debridement are the first steps, followed by definitive management. Anesthesia should be used as appropriate, and closure may be either immediate or delayed. The best option for any grossly contaminated wound in the backcountry is delayed primary closure, as it is for wounds managed in

Figure 2. The author irrigating the wound at 4300 meters. Photograph courtesy of Ken Zafren, MD.

Figure 3. The author anesthetizing the wound. Photograph courtesy of Ken Zafren, MD.

the nonwilderness setting. This technique is underused in both wilderness and nonwilderness settings.

The use of glue (Dermabond) is a tempting alternative and may be suitable for small facial wounds, which can be decontaminated easily. However, the chance of infection is likely higher than for wounds that have been taped.

A complete discussion of wound care in the backcountry is beyond the scope of this article. For a general treatment, the reader may consult the *Wilderness Medical Society Practice Guidelines for Wilderness Emergency Care*.² A more detailed treatise is Trott's *Wounds and Lacerations: Emergency Care and Closure*.³

In the case of the climber with the crampon injury, immediate primary closure with sutures was a very reasonable option. I irrigated the wound copiously with sterile normal saline (Figure 2), prepared it sterily with povidone-iodine (Betadine), but did not drape it as I was operating on the wound with the leg propped between 2 points rather than on a nonsterile surface. Natural lighting with sunlight (and snow reflection) was more than

Figure 4. The author closing the wound. Photograph courtesy of Ken Zafren, MD.

adequate. In fact, sunglasses were required except when actually looking at the wound. I anesthetized the wound with lidocaine (Figure 3) and repaired it using 4-0 nylon running suture (Figure 4). I was able to obtain good edge approximation. I then placed a sterile dressing. Good anesthesia was maintained throughout the procedure, which the patient tolerated well. I gave her all the usual wound care instructions and recommended that suture removal be done in 10 days. She was able to continue her descent of the mountain soon after the procedure.

Lacerations are actually a rather infrequent backcountry injury. I have sutured only a handful of lacerations on expeditions and at the Himalayan Rescue Association in Nepal. One memorable laceration occurred on a med-

Figure 5. Wound repair on the trail in the Buri Gandaki River Valley, Nepal. Photograph copyright 1980, Ken Zafren, MD.

ical expedition in the Buri Gandaki River Valley of Nepal when a porter fell. As a first-year medical student, I was only a spectator at the laceration repair, which was accomplished in a very adequate and sterile fashion (Figure 5). The patient sustained a number of injuries in his spectacular fall down a 10-meter embankment, but continued with the expedition. At first he did not carry a load, but in a week or so he was carrying a full load again. His wound healed without complications. As one can see from the photograph, natural light was quite adequate for suturing. Another time, also trekking in Nepal, I assisted Eric A. Weiss, MD, who sutured a wound by headlamp.

Wound care in the wilderness is just as much of an art as wound care in the clinic or the hospital. The same principles, basic techniques, and attention to detail will yield the best results, but limitations of resources will affect the choice of methods to be employed.

References

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