CASE REPORT

Mountaineer's heel

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Mountaineers are at risk of skin lesions caused by constant boot friction. This is the case of a 35 year old mountaineer who presented with large and deeply ulcerated lesions over the medial aspects of both heels after a two and a half day climb using crampons. A number of factors such as the length of the climb in cold and thin air and the impossibility of removal of the footwear to allow rapid rewarming may have contributed to a more acute presentation of these lesions.

Mountaineers often endure extreme physical conditions that can translate into a variety of skin problems, among others. Frostbite is probably the most common skin pathology that brings climbers into contact with health professionals.¹ Other reports include acute and chronic actinic damage and seborrhoeic dermatitis,² and, more recently, a higher prevalence of malignant melanoma has been suggested.³

Mountaineers are at risk of skin lesions caused by constant boot friction. However, as opposed to other sports in which repetitive movements are performed for long periods of time, there is often no possibility, when climbing in high mountains, of stopping the action once a painful lesion has occurred. This, together with other factors, can rapidly aggravate skin lesions in this sport.

CASE REPORT

A 35 year old mountaineer presented with large ulcerated lesions over the medial aspects of both heels (fig 1). He had just returned from a two and a half day mixed climb on rock and ice at the Matterhorn (Switzerland, 4478 m) which required the use of crampons. Pain in the affected areas was noted within the first 24 hours of continuous exercise. Despite regular climbs with the same boots and socks which had an adequate fit, there had been no previous blistering problems. However, on this occasion and because of adverse weather conditions, the climb was prolonged for over

60 hours, during which time the climber was not able to remove his boots even during the nights which were spent in bivouacs.

He was treated with antiseptic potassium permanganate (1:10 000 dilution) baths and advised to rest his feet. Swabs were not performed. Wounds were clean within five days when hydrocolloid dressings were applied. There was full resolution of the lesions within four weeks.

DISCUSSION

Blistering and erosions on feet are a common occurrence in mountaineering, as they are in any other activities involving repetitive movements and friction such as running or hiking.^{4,5} There are, however, added factors in climbing that can aggravate this process leading to a more severe presentation. Whereas walking downhill puts strain on the toes, walking or climbing uphill enhances the shearing force present over the heel.⁶ This can be aggravated when climbing with crampons (fig 2), particularly on ice or during mixed climbs on ice and rock. In these circumstances, the force accumulated over the front points of the crampons increases the shearing force over the skin of the heel even further. In addition, decreased peripheral blood flow and low oxygen partial pressure in low temperatures at high altitude will limit the defensive mechanisms of the skin.⁷ Also, on long mountain tours with little or no possibility of adequate rest or removal of the boots and rewarming of the feet, the skin is under prolonged strain. All these factors work together to aggravate erosions and blisters and can lead to an overall more severe presentation. To avoid this, it is recommended that climbers train in their boots and get their feet used to them on long but easier climbs with adequate rest. This will eventually lead to callus formation over areas with maximum friction as a response to repetitive trauma and so prevent blistering. The lack of callus formation on the heels of the climber described here indicates a possible lack of sufficient training in climbing with crampons. It is advisable that areas most likely to be damaged by friction, such as heels, should

Figure 1 Superficial abrasions with crusting over erythematous skin.

Figure 2 Mountaineering boot with crampon.

Take home message

- Blistering of the feet often presents in a severe form in mountaineers.
- Prolonged training with new boots and tape dressings to areas at risk are preventive measures.
- Blisters should be punctured between 24 and 72 hours and roofed blisters tape dressed.

be protected with a tape dressing. If blistering occurs, blisters should be drained through a small puncture within 72 hours—for example, using a clean pocket knife—thereby leaving the overlying epidermal roof intact. To avoid further damage through friction, roofed bullae should then be taped. This is based on a study showing that draining friction bullae within this time frame produced a higher incidence of blister top adherence, with the blister sites becoming functional earlier and causing less discomfort than sites with no drainage or earlier or later drainage.⁸

In summary, acute blistering of the heel, although common, can be severe in mountaineers. This is due to a combination of factors that are unique to this sport such as constant boot friction, the impossibility of adequate rest or change of footwear, and the presence of external factors such as cold weather and low oxygen partial pressure in high mountain climbing. It is suggested that this pathology therefore merits consideration as a distinct clinical entity: “mountaineer's heel”.

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COMMENTARY

Blistering problems are common in mountaineering especially at the beginning of the climbing or alpine skiing season or when new footwear is used. Dr Strauss presents an extreme case of blistering on the heels after a two and a half day climbing trip with crampons. The combination of factors such as friction caused by an unfamiliar activity, cold, and high altitude may lead to a typical ulcerated skin lesion “the mountaineer's heel”. Most mountaineers are aware of this skin problem and prevent it by training to induce callus or by taping. Callus (hyperkeratosis or epidermal thickening) due to moderate repetitive trauma is a physiological protective reaction of the skin. Alternatively tape dressings can be applied to the areas at risk of blistering (fig 1).

Figure 1 Tape dressings applied to heels to reduce the risk of blistering.

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