WINTER CASE DISCUSSION

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The following question has been posed to an international panel who give their responses below:

A climbing team, who plan to go to Everest in 4-5 months time (in the pre-monsoon seaon) have just returned from a succesful "practice run" on Cho Oyu but 2 members sustained second degree frostbite to their toes. Both have achieved re-epithelialzation of the digits concerned but still have areas of paraesthesia and occasional hyperaesthesia.

1. Would they be at increased risk of further cold injury - assuming that all other factors such as tight boots / not warm enough boots, windchill are corrected ?

2. What is the average time frame in which complete recovery (if that is truly possible) takes place.

3. Would a return to an 8000m peak (Everest) in 4-5 months time be too soon for reasonable recovery ?

Bernard Marsigny, Chamonix, France
Thank you for the question. I have excluded 1st degree frostbite injuries from the discussion.
In my experience (just as a lot of other authors, in Europe and USA), former frosbite increases the risk of cold injury. This is not the only risk factor; individual sensitivity is important and, maybe, these two people are more sensitive. Furthermore, it would be interesting to know if they wore the same equipment as the other team members.

Anyway, in reply the first question, even if the other factors (especially tight boots) are corrected, the risk of further frostbite injury is great, even for a lesser degree of cold exposure.

Complete recovery takes place very late, some years after, and sometimes never. Patients complain of residual pain following cold exposure for years after the initial injury. In deep frostbite, the nervous sequelae decrease with time but are replaced by early distal arthrosis.

A return to an 8000 peak (nearly 9000) in 5 month is too soon, definitely. This is a doctor's opinion !

As an alpinist, my reply would be less affirmative... Everest is tempting, and modern shoes are very effective...In fact the question if very difficult !

A good reference on the subject : Frostbite and other cold-induced injuries by McCauley and al in Wilderness Medicine, 3rd edition, Auerbach editor, Mosby.

Robert B Schoene (USA)

My thoughts are that it might be a bit early since it has been my experience that the tissues will still be a bit fragile. They will certainly still be hypersensitive to the cold (for up to 25 years in my experience). obviously that is not a deterrent.

Frank Tschirky
Swiss Federal Institute for Snow and Avalanche Research
Because I am neither a member of the ISMM nor a medical doctor I can not comment medically on the questions about frostbite and the necessary recovery. But as an old expedition climber and mountain guide I would say the time of 4-5 months would be too short for a reasonable recovery.

Jim O'Malley (USA)
If these climbers did sustain an intermediate level cold injury to their feet, the best option for them is to minimize their risk of cold exposure for at least a year, and then to use all precautions to protect their feet from cold exposure in the course of their climb. One problem remains for these climbers, and that is that they may always be at increased risk for cold injury depending on the depth of their injury in the first place The decreased sensitivity that you describe that these climbers have in their feet now will render them more susceptible to another cold injury, since they won't be able to feel that their feet are freezing. Another problem is that these climbers will be exposing themselves to both altitude and cold, and these two extremes are more than additive.
I would recommend that these two refrain from the exposure for a year. The mountain will still be there.

Bruno Durrer (Switerland)
I am not a frostbite specialist, but I have a few mountaineers every year in my practice mainly with frostbitten fingers. According to my experience there is an increased risk - and to go to Everest after 4-5 months would be rather too early with an increased risk.

Dave Syme(UK)
I wouldn't want to comment in an "expert" way on frostbite but it occurs to me that if two members of the team sustained frostbite on a "successful" practice run, perhaps they should be attending more to their BRAINS than their feet and making sure that (a) they really are keen to put themselves in danger in this way and (b) they are better organised next time!

Charles Houston (USA)
In my opinion persons whose toes have suffered second degree frostbite will be more sensitive and susceptible to cold for many months and probably years. From my own experience I believe it would be unwise to attempt Everest 4-5 months or even more after the frostbite. Paraesthesias (chillblains) and increased cold sensitivity is likely to last for many many years.

Editor’s conclusion
1) Recurrence of Cold Injury: it seems that these climbers will be at risk of frostbite again but it is impossible to judge how much or little exposure would be required. After significant cold injury, there is a high incidence of recurrent symptoms on

exposure to minor cold stimuli (thought to be due to persistent and marked vasospasm). This presumably increases the risk of a repeat of frostbite too. People who have had frostbite once can get cracked painful skin on exposure to cold (even non-freezing cold exposure). Recurrence is likely with a lesser degree of exposure than they received on Cho Oyu but not necessarily unavoidable. The combination of extreme altitude hypoxia and cold on Everest will put these digits in grave danger.

2) Recovery: Deep structures such as muscle and bone do not seem to have been involved in these individuals. There may be surprisingly good recovery despite large areas of involvement in the early stages. Up to 3 months may be required following injury before it is clear which tissues are non-viable, at which time experienced advice from plastic/orthopaedic surgeons should be sought. Early surgery should be avoided unless there is infection. With more superficial injury, recovery is longest for nerves. From experimental nerve injury and clinical experience, this may take up to 9 months. One study found 61% of individuals following cold injury had a persistent burning sensation after 'full' recovery and anecdotal evidence demonstrates persistent symptoms for over 30 years.

3) Advice: Finally, it is difficult to give definitive advice without more of an idea about how the hands and feet look now. Do they have complete healthy skin cover? Assuming the hands/feet now look reasonable, I would expect superficial tissue (other than nerve) to have mostly ‘recovered’ by next Spring. Recovery may not return the individual to normal. The hypoxia at 8000m is probably a major factor in the high incidence of frostbite on the highest peaks. The safest advice is that they should not expose themselves again so soon. But this may be unrealistic, If the climbers are determined to go they should take great care to ensure well-fitting insulated boots, warm layered socks, keep their feet dry, and to use supplementary oxygen (as finances dictate but definitely above 8000m). They should only take their gloves off when in a warm tent environment. The progress of their extremities should be reviewed as the expedition progresses by the expedition doctor.

On the other hand, if the frostbite was severe and the hands and feet are still raw and there is incomplete coverage with healthy skin they should be advised that they are at great risk of further severe peripheral injury at 8000m. They should consider the importance they place on climbing compared with their hand function and consider the likelihood of a repeat of their current situation or loss of digits.

AJP

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