

## PRE-EXISTING MEDICAL CONDITION—Ascending Too Fast

California, Mt. Shasta, Clear Creek Route

Around 9:30 p.m. on Friday, October 7, two climbers (both male, mid-20s) left the San Francisco area for a fast ascent of Mt. Shasta by the Clear Creek route up the southeast side, a 16-mile round trip with 7,800 feet of elevation gain. In late summer, the route is mainly hiking with Class 3 rock scrambling above Mushroom Rock.

After arriving at the trailhead at 6,500 feet, the two slept for three hours before starting their ascent at 5:30 a.m. After seven hours, they had ascended more than 7,000 feet without problem. At 1:30 p.m., one of the climbers started feeling uncomfortable but still capable of continuing up. Just below the scramble near the summit, approaching 14,000 feet, he felt worse and needed to rest.

At 1:45 p.m., after completing the scramble, the climber's discomfort level suddenly increased, with severe abdominal pain. Both climbers realized they needed to abandon the summit push and descend. The climber in pain started walking down without his pack, with his partner following behind and carrying both packs. The partner soon caught up with the stricken climber near a football-field-sized flat snowfield above the scramble. He was lying on a flat rock, very pale, and in extreme pain, unable to sit or stand.

At 1:50 p.m. the partner attempted a 911 call via his mobile phone, with intermittent one bar of service. He was able to connect briefly and request helicopter evacuation near the Mt. Shasta summit. He soon lost voice service but was able to maintain texts. The 911 dispatch operator contacted California Highway Patrol, which dispatched a CHP helicopter from Redding. Meanwhile, the partner tended to the ill climber, periodically monitoring him for movement and replies to questions. Several other hikers gathered to provide help if needed. The partner was able to continue texting 911 to provide incident status, using a backup battery pack. One of the hikers had a GPS, which allowed him to provide the coordinates of the incident location and the elevation of 13,850 feet.

At 3:50 p.m., the CHP helicopter arrived on scene and was able to land on the flat snowfield. The pilot and partner carried the injured climber back to the helicopter and got him into the rear seat. Due to the high elevation, the helicopter could not carry other persons or gear. The partner began his descent and was able to reach the trailhead at 11:15 p.m. and drive to Mercy Medical Center by midnight.

The emergency room doctor diagnosed that emergency surgery was needed, but felt that a Level 1 hospital would be much better equipped. The doctor administered pain medication and said the climbing partner could drive the patient to a hospital in San Francisco, where they arrived at 6:15 a.m. on Sunday after being on the move for about 36 hours. The climber underwent surgery for splenic infarction plus acute appendicitis. He was discharged two days later and made a full recovery in three months.

## ANALYSIS

Both climbers were very fit and physically able to reach 14,000 feet from sea level within 16 hours. This rate of ascent put them at a high risk of adverse reactions to altitude, like AMS, HAPE, or HACE. Other factors that may have contributed to the risk were possible dehydration and the exertion involved in the final rock scramble.

In this incident, the climber had a pre-existing health condition that increased his risk at altitude. Sickle cell trait is an inherited condition that involves a faulty hemoglobin gene and is not generally symptomatic under normal conditions. It can be determined by a blood test and is often assessed for college athletics. Sickle cell trait prevalence in the United States is 0.2 percent among Caucasians and nine percent among African Americans. Before the incident, the climber was aware that he had sickle cell trait, but he did not know the trait carried additional risk at altitude.

Individuals with sickle cell trait have an elevated risk at altitude of splenic infarction, which is tissue death in the spleen due to reduced oxygen. Complications of splenic infarction include rupture and hemorrhage, necessitating emergency surgery. In this case, descent alone would not have improved his medical condition; he needed prompt evacuation and medical treatment. It is unknown if there was a direct connection between the climber's splenic infarct and his appendicitis. He very well might have ended up in the hospital whether he had attempted Mt. Shasta or not. (Editor's Note: Click here to read a study about the link between splenic infarct and altitude.)

The successful rescue in this incident depended on several things, some of which cannot be counted on. Cell phone service in the mountains, having a backup phone battery, and mountain terrain that allowed the helicopter to land close to the incident were all necessary.

Proper acclimatization is generally achieved by gradual ascent above 8,000 feet. A more typical ascent from sea level to 14,000 feet would take at least three days. For most instances of severe AMS, HAPE, and HACE, the definitive treatment is descent of at least 3,000 feet. (Sources: Climber and partner, www.ncbi.nlm.nih.gov, and the Editors.)

## Images

## **Article Details**

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