

TWO DEATHS IN TWO DAYS: A CASE REPORT OF MOUNTAINEERING FATALITIES ON MOUNT RAINIER

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Abstract

Mountain climbing is a popular recreational activity that has experienced an increase in the number of fatalities as the popularity of mountaineering has increased. This case report presents the conditions surrounding two mountaineering fatalities on Mount Rainier, Washington, U.S.A. The fatalities occurred on subsequent days and in approximate locations. Environmental conditions and falls of 91 m and 250 m were identified as contributing mechanisms in both deaths. However, the role of climbing behavior is called into check as the climbers involved in both incidents repeatedly ignored warnings about poor climbing conditions and one victim ignored warnings of climbing solo.

Key words: *mountaineering, Mount Rainier, fatality, falls, behavior*

Introduction

Participation in outdoor sports is on the rise [1-3]. In the United States, the 2003 National Survey on Recreation and the Environment reported that the vast majority of Americans participate in some type of outdoor sport activity each year [4]. Mountaineering in particular is an increasingly popular outdoor sport activity despite its perception by non-climbers as a high-risk activity [5-7]. Traditionally, mountaineering attitudes have been strongly influenced by 19th century values of discipline, self-denial, cooperation, and romanticism [8, 9]. However, regardless of the values, it is evident that the number of mountaineering fatalities has increased as the popularity of mountaineering has increased [5, 6, 10].

The intent of this case study is to review the deaths and identify the contributing mechanisms of two mountaineering fatalities on Mount Rainier. Such reviews can provide useful insights into mountaineering incidents and could aid in the development of preventive measures. Both fatalities occurred on subsequent days and in approximate locations. Mount Rainier is a popular mountaineering destination in the state of Washington that summits at 4392 m [11]. The mountain is the most heavily glaciated peak in the lower 48 states with 26 major glaciers and 90 km² of permanent snowfields and glaciers. Additionally, approximately 50% of the estimated 8000 annual climbers attempting to summit Mount Rainier are successful [6]. The information for each case study was retrieved from the original and official incident and investigation reports (NPS Forms 10-343 and 10-344) conducted by supervising park rangers in Mount Rainier National

Park. These reports contain information on the socio-demographics of each involved persons, the date, location, and nature of each incident, a detailed narrative and summary describing the emergency response to the incident and the nature of any injury or illness, a detailed narrative analysis describing the incident, a detailed outline of the incident investigation, and witness statements. Supplemental information contained in the original incident reports includes photographs, hospital reports, and coroner / medical examiner reports. No toxicological reports were included in the reports for either case report.

Case Report 1

Two male climbers aged 38-years (Male 1) and 29 years (Male 2) were at 3900 m and descending the Emmons Glacier via the Disappointment Cleaver route when an ice layer beneath Male 2 slid out from under him. Three Climbing Rangers had earlier informed both men that climbing was not recommended because of poor weather conditions. The Rangers cited that late August storms had recently brought freezing rain, high winds gusting to 80 km, and snow which led to the development of icy climbing conditions. However, despite these warnings, the climbers decided to attempt a summit climb at 0500 hours. They felt a summit attempt was plausible because their crampon penetration was adequate despite a layer of snow on top of the ice.

The two climbers failed to summit and began to descend the summit area at a pre-arranged turn-around time of 1500 hours. During their descent the climbers were using boot ax belays and were leap frogging each

other. Due to the weather conditions, the trail was not visible, there were multiple exposed crevasses, and the surface became brittle as it was refreezing. The climbers had already slipped twice when the ice layer below Male 2 broke away. Male 1 attempted to arrest the fall by pushing his ice axe shaft through the rope coils and into the snow. Unfortunately, the anchor failed when the rope pulled against it which in turn caused Male 1 to lose his footing and balance. Together, both men slid 91 m downhill. Male 2 fell an additional 15 m into a crevasse and Male 1 slid over an ice wall cliff falling an additional 18 m before landing on a flat section of ice. Following their fall both Male 1 and Male 2 were able to call out and speak to each other. Male 2 suffered a fractured left arm, torn cartilage between his ribs, and temporary blindness. Male 1 was bleeding profusely, had severe facial injuries, a flailed chest, and broken pelvis.

Approximately 40 minutes after the fall, two additional climbers who had witnessed the incident from the summit area arrived on scene. They wrapped Male 1 in a sleeping bag and extra clothes in an attempt to treat him for shock and exposure. Male 2 was removed from the crevasse he fell into using a Z pulley system and was then sealed up in extra clothing and a sleeping bag next to Male 1. Both men were placed in a biovac snow pit and duct taped together. Due to his injuries, Male 1 passed away at 1930 hours. Just prior to his death he gurgled up blood and clear fluids, gasped for water, and his tongue twisted in his mouth. The following morning the assisting climbers alerted other climbers of the incident with three sharp emergency whistles. A military Chinook-D helicopter evacuated the climbers at 1200 hours. The final cost of the rescue operation was USD \$2518. The military did not charge for the helicopter services.

Case Report 2

A 41-year old male presented to Mount Rainier Climbing Rangers at the Jackson Visitor Center at 0830 and asked permission to attempt a solo climb on Mount Rainier. He was informed he would need to apply for a solo permit in writing if he wanted to procure such a permit. He was also informed that the solo climbing permit process takes approximately two weeks to process. When questioned, the potential solo climber was evasive in answering questions from Climbing Rangers and refused to give them his name or address. The Climbing Rangers suspected that the man was under the influence of illegal narcotics.

The unnamed potential climber left the Jackson Visitor Center stating that he would try joining up with another climbing party. Later that day around 1545 hours he arrived at a public shelter situated further up the mountain. He had made the climb wearing flip flop sandals instead of shoes or hiking boots. When

questioned by another park official about hiking boots he indicated that he did have boots but that they were uncomfortable. He also indicated that the condition of his hiking boots may prevent him from climbing any further on Mount Rainier. Nonetheless, one hour later he was seen venturing further up the mountain to Ingraham Flats and back using only an ice ax. He used no crampons, did not carry a backpack, and was wearing only a single thin layer of clothing despite the temperature falling and the snow beginning to freeze. Another Climbing Ranger informed the man of the same weather conditions reported in Case Report 1 and stressed that climbing the mountain solo without a permit was illegal. The climbers' response to this third warning was reported as very casual and non-caring.

The following morning at 0735 hours, two mountain guides assisting with the rescue of the climbers in Case Report 1 encountered the same man illegally climbing solo on the Emmons Glacier, Disappointment Cleaver route around 3840 m elevation. They informed him of the deteriorating climbing conditions, the ongoing rescue situation in Case Report 1, and that no further help was needed in the rescue. Despite this information the solo climber continued on with his route. However, shortly thereafter the guides witnessed the solo climber crouching while descending on steep ice. At this moment the solo climber caught his frontpoint crampon on his gaiter and began a 250 m fall. The two guides yelled at the solo climber to self arrest and kick his feet in. However, the soloist did not attempt to self arrest with his feet or ice ax. Instead, he continued sliding on his back at a high speed, spun around so he was sliding head first, and fell a final 3 m before coming to a stop inside a crevasse.

The mountain guides descended to the point where the body of the solo climber was sprawled out in the crevasse. After securing an airway, checking for a carotid pulse, and finding no signs of life, they marked the site and departed the crevasse. The body was later picked up by the same helicopter involved in Case Report 1. The final cause of death was reported as multiple internal injuries. The question of suicide was raised about the victim because of his earlier behavior when speaking with rangers. It was also raised because he was offered a rope with another climbing party but refused it after stating he wanted to climb solo. Excluding helicopter costs, the final cost of this incident was USD \$3310.

Discussion

The nature of the mountain environment can present a number of challenges for mountaineers. Such challenges range from rockfall, icefall, and avalanches to hypothermia, high altitude pulmonary edema, high altitude cerebral edema, and sudden cardiac death [5,

12]. However, as was the situation in both case reports, the contributing mechanism in most mountaineering fatalities are falls [13-15]. Previous research has identified that the median distance of a fatal fall is 91 m compared to a non-fatal fall of 9 m [10]. In both case reports the mountaineers slid distances of 91 m and 250 m. In addition, the slope, landing surface, and efforts made to arrest a fall have been identified as contributing mechanisms in mountaineering fatalities [10]. While the degree of slope was not recorded in either case incident report, all three mountaineers fell an extra distance after their initial slide. Despite an initial attempt to arrest their fall, in Case Report 1 the fatality occurred after Male 1 fell over an ice wall and landed on an uneven surface whereas the rate of fall for Male 2 was somewhat arrested by the narrowing walls of the crevasse he fell into. In Case Report 2 the victim made no attempt to arrest his fall despite the yells of witnesses to do so. In fact, the victim in Case Report 2 made what appeared to be an intentional effort to turn around and slide head first at a high rate of speed.

Although mountaineering on Mount Rainier is not considered as challenging as Mount Everest or Mount McKinley, venturing onto Mount Rainier is still a serious undertaking. Search and rescue operations on Mount Rainier typically run an average cost of USD \$9100 per operation [16]. Moreover, the presence of glaciers and crevasses on the mountain exacerbates the environmental extremes regularly faced by climbers. For example, glaciers and crevasses are thought to play a role in 50% of mountaineering deaths on New Zealand's Mount Cook and is a known factor contributing to mountaineering incidents on Alaska's Mount McKinley [2, 7].

A final key contributing mechanism that cannot be ignored in both case reports is the behavior of the mountaineers. The reasons behind an individual's decision to climb mountains are complex but these two case reports call into question the behavior and poor decision making of the climbers. Behavioral issues have been identified as a contributing factor in mountain sport incidents and decisions such as deciding to climb solo have proven fatal for climbers [2, 17]. Despite this the climbers in both case reports chose to ignore the advice and warnings of Climbing Rangers and mountain guides and their decision proved to be fatal. In addition, the victim in Case Report 2 appeared to lack adequate equipment, adequate climbing skills, and insisted on pursuing an illegal solo climb. Climbers attempting to summit Mount Rainier are required to register with Mount Rainier National Park authorities. Registration permit systems such as the system in place on Alaska's Mount McKinley have proven successful at reducing the number of mountaineering fatalities and providing controlled

opportunities for risk management messages to be delivered to potential climbers. Whether or not this is the same with Mount Rainier is unknown although it is generally recognized that some climbers are able to avoid the registration system [6].

Stronger risk management messages directed at climbers combined with strong enforcement of climbing rules may help avoid situations such as those reported in these two case reports. However, the ultimate responsibility for personal safety and appropriate behavior belongs to the individual climber. Adequate knowledge and training is essential to mountaineering and may have helped prevent both reported fatalities. For example, the boot axe belay technique used by the climbers in Case Report 1 is often criticized as an old school technique that is not able to withstand the full weight of a fall. If the boot axe belay fails, the flying axe and slack in the rope present hazards to climbers. The use or knowledge of safer belaying techniques such as those recommended by the International Mountaineering and Climbing Federation (UIAA) could have prevented this incident [18, 19].

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