Human Interaction in Sump Rescue

In July 1991 two non-cave divers were exploring a flooded cave in Venezuela when they became lost. One found his way to the exit. The other surfaced in an air bell. Cave divers from the U.S.A. were flown in and found him two days later. When the lost diver first saw them, he was hallucinating and thought that they might be angels. When he discovered that they looked and sounded like Americans, his suspicions were confirmed. Well, that last bit isn't true.

Considerations

In sump rescue, like any type of rescue, there are complex forms of human interaction. These include between the patients, patients and rescuers, and amongst the rescuers. Cave divers should be aware of these dynamics in case their help is ever called upon. In this article we will examine a number of historical case studies to draw out the psychological elements. We will pay special attention to those elements peculiar to sumps.

In the period between when a group of cavers realize they are trapped behind a sump and when rescuers first make contact with them, relations between the cavers are generally above average. The feeling of danger, the unknown amount of time they'll be trapped, and the limited resources force the group to work together. The most frequent disagreement is over whether to shelter or gamble with a breath-hold dive. As time goes on and their lights die out, psychological pressure increases.

In several incidents, cavers have reported not knowing if they were hallucinating or not. Random cave noise is misinterpreted. They are not sure if they have been visited by a rescuer or not. The probability of events like this seems to increase over time, and is also more common in smaller / solo groups. This is why as a rescuer, when you first find the missing group and then leave to report your discovery, it is important to leave something tangible behind so they know you were there and did not imagine it.

The first encounter between a trapped caver and a sump rescuer is a sensitive time. The patient will expect to be immediately extracted from the cave, and may be desperate to get out. In rescue diver courses, open water divers are trained to stay out of reach of panicking divers. Sump rescue is no different. If possible, stay out in the water while you talk to a caver up on shore. If you're going to get out of the water, leave your tanks away from where they can easily get to them.

Keep your initial conversation basic. In smaller chambers, the oxygen may be reduced and there may be increased carbon dioxide, so do not be surprised if they have reduced mental capacity. They will want to talk about when they will be extracted, food, and the status of others who were in the cave but aren't with them now. If they have been trapped for any amount of time, they will be eager to eat anything you can give them. If it has been a more than a few days, consult with a doctor first when packing the kit you'll bring with you for any missing people you encounter.

Psychologists prefer that the first encounter between the trapped cavers and rescuers include people that the trapped are familiar with. This keeps things simple, is calming, and reassures the patients they will get taken care of. From then on, interactions and communication can be with people they are introduced to.

After finding the patients and before they leave the cave, regular communication and medical support will ramp up. In a hasty rescue, you'll swim the patients out as soon as you find them, but in a deliberate rescue there will be several dives to shuttle equipment. It is OK and even suggested to pass personal messages back and forth between the patients and their families. Whether to limit the topics that can be discussed is an open question. The patients will worry about being blamed for the incident and will want to know that their personal affairs are being taken care of. On the other hand, telling the patients about problems their families are having will not help them. If the patients are separated and swum out in sub-groups, and some are injured or killed in the process, consensus is that the remaining patients should not be told. Patients' faith in their own rescue is a vital commodity.

In an ideal situation, the patients will be rescued from a temporary sump through the lowering of the sump. In this case, coordination of timing will become an issue. The patients will be eager to leave the cave as soon as possible, no matter the method. The rescuers will want to prevent too-soon an exit, as the moving water associated with a temporary sump may create swift-water hazards. Sump rescues are perhaps unique amongst rescue situations in that it is also possible to wait too long. Weather may worsen and re-close the sump. If pumps are emptying the sump, timing must be such that everyone can still get out if the pumps fail after they have started movement. The rescuers must convince the rescuees that they will not be allowed to choose their own timing.

Rescuer-rescuee interactions are even more important in the case of permanent or long-lived sumps. If you are going to swim a patient out who does not have cave diver training, you need to be able to trust each other. The case history is full of three outcomes: there was a good relationship and the patients stayed calm, the rescuers took measures to restrain the patients, and there was a wrestling match. Taking time to assess the psychological state of the patient and your relationship with them would seem to be warranted.

When it comes to interactions between the rescuers, all too often there is controversy over whom to send into the cave. In a rapidly developing situation, should a local cave diver who knows local procedures and people be sent to get the missing group help as soon as possible? In a static situation, should they wait for a Big-Name Caver to be flown in? Do the available divers have compatible procedures, equipment, and languages? Whose SnapFace account should they post updates to?

Case Studies

Let's take a look at the case history. We'll look at four rescues, examining the interactions between the rescuers and patients.

In 2019, cave divers were re-lining the Mill Pond cave in Tennessee, U.S.A. in limited visibility when the team got mixed up. One of them, Bratchley, wound up in a good-sized air bell with no line back to the exit. After extensive efforts by his teammates to find him, they called in additional support. The events of the initial rescuer-rescuee encounter are well known due to being captured on video. The rescuer, Sorenson, spoke to Bratchley from some distance away, made sure to check on his mental state, and calmly and simply explained the extraction plan. Bratchley knew of him and could have faith in their exit. The hasty rescue was successful.

In 2019, a dry cave guide and one tourist got trapped behind a sump in Falkenstein Cave in Germany. A rainstorm was raising the water level in the cave and the other tourists exited, while the guide and tourist were willing to push further. The rain sumped the cave and they were trapped. Local sump divers, including Rainer Straub, responded and located them. After rewarming the patients, the rescuers dove with the guide out of the cave. The guide had basic open water experience and experience as a dry caver. The tourist had no diving experience. Straub gave the tourist a half hour "Discover Cave Diving" (DCD) class. The tourist was given their own scuba equipment, and followed Straub through the sump. Straub stayed well in front of them. A member of the German naval special warfare community swam behind the tourist, ready to bear hug him if he panicked and swim him the rest of the way. They figured they would resuscitate him on the surface if needed. The rescuers used proper discrimination to treat the patients according to their individual abilities and needs.

In the 2018 incident at Tham Luang cave, Thailand, the soccer team were not the only ones to be rescued. During their initial dives at the cave, rescuers Stanton and Volanthen came upon four Thai workers trapped behind a sump, with rising water imperiling them. The incident management team was not using proper access control at the cave entrance, and no one knew they were even missing. The only language the divers and workers had in common was gesturing. Stanton and Volanthen gestured their way through a DCD class, and one at a time had the workers hold on to them and swam them through the restricted sump. At the far end, when the workers saw air, they would try to bolt for the surface, and minor wrestling matches ensued. There was no relationship and no trust, but the rescuers were able to cope for a limited time.

For our last case study, we will examine a non-cave diving incident. In 2010 thirty-three miners were trapped seven hundred meters underground in the Copiapó mine in Chile. Part of the mountain collapsed, completely blocking the tunnels to the lower portion of the mine. Fifty-two days elapsed between when an initial tiny hole was drilled down to discover the miners, and when they were finally returned to the surface. In the days between the collapse and when the first drill found them, the danger and limited resources forced the miners to put aside their differences and get along.

After a generally positive start, the interactions got worse. In their initial voice contact with the rescuees, instead of having a fellow miner speak to them, a national-level politician made the phone call. The first supplies sent to the miners were simple glucose drinks, which they were told to drink over a period of hours. The miners guzzled the drinks and got sick. The rescuers tried to limit the conversations the miners' families had with the miners, but all too often the families' problems were brought up, which only made them feel worse. With the sense of danger removed, and disagreements about media rights after the rescue, the relationships between the miners deteriorated. When drill bits broke and interrupted progress on the rescue shaft, the miners' faith in their rescuers also deteriorated.

Conclusion

Sump rescues are complex operations, both technically and interpersonally. The good behavior of the Thai soccer team in 2018 should not be assumed to be the norm. Cave divers

participating in a sump rescue should assume their patients are under extreme pressure. Keep things simple, build the relationship, and be ready for when things fall apart.