Neurological DCI

The Diver

The diver is a 27-year-old female scuba instructor who has been certified for four years. A technical diver, she has made more than 250 dives since certification. She indicated that she was taking an anti-anxiety medication. She had no history of injury and was in good physical health. At the time of the dive in question, she was making her first decompression training dive.

The Dive

The dive plan called for the diver to make her first decompression training dive to a depth of 140 feet (46 meters) for 20 minutes. Her breathing gas was air using open-circuit scuba in a drysuit for thermal protection and a buoyancy control device. Her drysuit experience included 20-plus previous dives in depths ranging from 20 to 60 feet (6 to 18 meters). Prior to this training dive, the diver had used dive tables for preplanning and contingency planning; for this dive, she was to follow her dive computer. Two students, an instructor and an assistance instructor made the dive.

The diver reached depth and began her skill drills, which included three valve shutdowns and a swim without mask. Visibility was limited, the diver was cold and felt the onset of drysuit squeeze, which added to her discomfort. She made all required drills well but was affected by narcosis: besides a generally anxious feeling, she experienced tunnel vision, her thinking was slowed and she reported that objects had an orange hue.

Decompression and ascent time lasted approximately an hour. The divers used oxygen blends with higher oxygen partial pressures on required stops; they used 100 percent oxygen at the final 20-foot (6-meter) stop. Despite her issues at depth, the diver reported that the dive went according to plan. The instructor said that he felt she had performed her drills well. No one else on the dive offered complaints of narcosis or other difficulties.

After she exited the water, she noted that her skin showed marks where her drysuit had squeezed her (possibly hampering her circulation). Noting this, she realized that she had not added significant air to her drysuit during her dive. She maintained that her narcosis had been so severe during the dive that she didn't realize how badly her drysuit squeeze had been. She did not have any buoyancy problems during her dive.

The Diagnosis and Treatment

With her symptoms just slightly improved while breathing oxygen, she was then transported to the nearest hospital, where the initial assessment noted her extreme fatigue and dizziness. She was then transferred to a second hospital that had a recompression chamber for the treatment of divers. Her chamber treatment began five hours after her original symptoms had begun. By the time she was first recompressed, her skin symptoms had become less severe, but she had difficulty walking and standing while unassisted. She received a U.S. Navy Treatment Table 6, with good results, with resolution of her aches, tingling, numbness and skin rash.

The next day she experienced a recurrence of mild joint and muscle pain, so she went to the local medical center and hyperbaric facility for a second evaluation. The diver noted that she felt dizzy, and medical

personnel saw that she was slightly unsteady when standing or walking. She was given a second U.S. Navy TT6. The result was minimal resolution of her dizziness and pain, but all of her symptoms resolved during the next three weeks. In two months, this diver returned to pool instruction, but she refrained from deep diving for four months. Since she has returned to diving, she has reported no return of symptoms.

The Discussion

Symptoms that occur shortly after a dive are always suspicious, especially when they represent unusual or first-time symptoms. Skin bends like rashes, marbling or mottled areas of the skin are rare, but often associated with cold-water diving in DAN case reports. According to the annual DAN Report on Decompression Illness, Diving Fatalities and Project Dive Exploration, most symptoms of decompression illness (DCI) occur in the first three hours after a dive.

The early onset and progressive evolution of these symptoms often indicate a serious case of DCI, which can be difficult to treat. Despite being surprised by the injured diver's unexpected symptoms, the trained divers in this case immediately began oxygen first aid and then transport to the nearest hospital. This likely played an important role in the diver's eventual but complete recovery.

Getting the diver to a facility that can help evaluate and appropriately treat DCI is another important aspect of this case. It's wise to seek immediate local medical care: although the first facility was not capable of treating divers, all hospitals can provide a neurological exam, intravenous fluids, oxygen and, if necessary, medically supervised transport. This hospital was no exception: medical personnel there were able to help stabilize the diver and verify her need for recompression.

DCI symptoms can wax and wane before and after treatment. In addition, such indications may not always clear after a single treatment. This is especially true in cases in which someone progresses from simple joint or muscle aches and pains to a general fatigue and difficulty standing or walking, as with this diver. One should continue to check with the treating physician and call DAN if questions arise. Symptom recognition, oxygen first aid, medical evaluation and treatment are all parts of the total picture in the response to DCI.

A Word from the Diver

This experience reminded me of the importance of details. Looking back, I probably wasn't comfortable enough with my drysuit before the dive. I didn't adequately respect how important it was to prevent drysuit squeezes, a condition that can inhibit circulation and increase discomfort during the dive. The suit squeeze and the extreme cold may have contributed to the skin bends-type rash I experienced. Additionally, I knew I had extreme narcosis: I should have been more conservative on my stops, doing more than the minimum requirements since the dive was quite stressful for me.

In the end, I have to say that this was probably the best diving experience I have ever had. Not that I would ever recommend this to anyone, but this experience has made me more aware of the conditions that surround a dive and ways to reduce factors that may lead to decompression illness, especially when making a technical dive. I still enjoy diving very much, but now when I dive, I think through and address issues that may cause problems before they present themselves.