Coming to Grips with Symptoms

The Diver

The diver was an experienced, 43-year-old female with more than 150 lifetime dives. She was reportedly healthy and reasonably fit, and she denied taking any medications regularly.

The Dives

The dives were made in the ocean from a private vessel; the diver breathed air and performed a three-minute safety stop on each dive. The water temperature was 14°C, and the diver wore a drysuit with attached gloves. The first dive was to 26 m for 22 minutes. After a one-hour surface interval, she made a second dive to 17 m for 40 minutes. Despite her use of dry gloves, the diver's hands became cold, especially during the second dive. At the surface she reported reduced sensation in both hands with associated loss of grip strength. She and her companions attributed the symptoms to being cold, and they headed home.

Contact with DAN

The diver experienced some difficulty driving due to the reduced sensation and strength in her hands. Thinking her symptoms resulted from being cold, she spent more than an hour immersing her hands in warm water, but she noted no change in her symptoms. Concerned that she might have decompression sickness (DCS), she called DAN. The diver and the DAN medic discussed her dive profiles, breathing gas and any potential issues that might have occurred on either dive. The discussion then turned to the symptoms: their time of onset, character and evolution. During the conversation two important pieces of information surfaced. First, her wrist seals were well used, meaning the chances were very low that constriction had impeded normal circulation. Second, the diver had a history of similar symptoms.



The Complication

The diver reported a history of carpal-tunnel syndrome. Upon reflection she noted her present symptoms were essentially identical to those she had before. Once carpal-tunnel symptoms became a likely explanation, the medic sought to determine whether some activity during the dive could have aggravated the condition. The diver explained that she made the dives to familiarize herself with the use of a new camera housing in the marine environment. She confirmed she had an appropriate amount of weight for ballast, but she realized she did not have the weight positioned for proper trim. The housing tended to float with the lens side up, which required her to flex her wrists to bring the camera into a usable position. The DAN medic encouraged her to be evaluated at the local hospital's emergency department that day.

Discussion

There are no tests or imaging methods such as X-ray, CT scan or MRI that can diagnose DCS. The diagnosis of DCS is typically reached by a process of elimination. This can be more difficult when a preexisting condition mimics the symptoms of DCS. Three primary factors are associated with the diagnosis: provocative dive profiles, proximity of symptom onset to diving and symptoms consistent with DCS. Let's review this case with these criteria in mind.

The diver's profiles (26 m for 22 minutes on air; 60-minute surface interval; 17 m for 40 minutes on air) were not particularly aggressive, but DCS cannot be ruled out based on this exposure alone. The actual onset time of the symptoms is somewhat unclear due to the fact that the diver's hands were so cold. However, the symptom onset was well within 24 hours, the timeframe within which DCS symptoms are expected to occur. Eighty percent of all DCS symptoms present within the first 12 hours following a dive.

Regarding the specific location of her symptoms, there are no documented cases of DCS in which symptoms occurred in both hands and nowhere else. Some might argue that a preexisting musculoskeletal condition could predispose the individual to an increased risk of DCS in the affected area. There is some evidence that this is a possibility, but no such predisposition is statistically apparent; the case data about DCS do not support the idea that previously injured areas of the body are prone to DCS. DAN's recommendation that the diver seek medical evaluation was to ensure review of all other possible signs and symptoms.

The Conclusion

The diver chose to wait until the next morning so a physician familiar with her condition could evaluate her. Her symptoms had improved slightly overnight and remained localized in her hands. The diver did not report any new symptoms. A physical evaluation determined that the reduced sensation originated at the heels of the hands and extended into the index, middle and ring fingers of both hands. The fifth (little) fingers were unaffected.

Based on this verified presentation and the manner in which the diver repeatedly flexed her wrists during the dives, the doctor suggested that the symptoms were consistent with an aggravation of the diver's existing carpal-tunnel syndrome. The doctor spoke with one of DAN's consulting dive physicians. After reviewing the profiles, the time of symptom onset, the character and progression of the symptoms and, ultimately, the objective physical findings, both doctors agreed that DCS was unlikely, and hyperbaric treatment was not recommended.

There is no substitute for a physical examination in person. A diagnosis cannot be made over the phone or based solely on signs and symptoms that appear in a particular list. None of the signs or symptoms listed for DCS is exclusive or unique to DCS; all factors need to be considered in their proper context. While one of the essential goals in the management of DCS is prompt initiation of treatment in a hyperbaric chamber, this should not supersede a thorough medical evaluation. Medical examinations that occur prior to

treatment have not been associated with negative clinical outcomes, and they may uncover other important causes of symptoms that were erroneously associated with diving.

If a diver develops symptoms following a dive, encourage prompt evaluation by a medical professional, and do not hesitate to contact us via the DAN Emergency Hotline (+39 06 42115685).