



ASK DR. DEBBIE...

By Debra A. Hill, MD

DCI: DEMYSTIFYING CERTAIN IDEAS ABOUT DECOMPRESSION ILLNESS...

That this month is when we all acknowledge and support Chamber Day seemed the perfect opportunity to share my own experience having to do with the dreaded Chamber.

Haven't you heard people whisper under their breath... "I heard so and so had to go to the Chamber, can you believe that...they must not have been a very good diver...or maybe they weren't very experienced...well, I've never been to the ...Chamber, have you?" And, yet how many times have we all had a strange pain, headache, felt a little dizzy, had a funny feeling, or felt exhausted after a dive or a day of diving, and had the fleeting thought, could this be DCI or DCS?

My last day of diving for my NAUI Advanced Diving Class was great! We all headed out to Catalina for a day of boat diving. I was a bit nervous to go on my first 100-foot dive, but excited as well. The instructor prepped me for the dive explaining that we would go to 100 feet for just about 6 minutes and then we would gradually work our way up the sloping contour of the bottom into the 20fsw depth where we would tour around for 5 or so minutes, which would be our safety-stop, then we'd surface. I was well rested, and ready for the dive. The water was amazingly clear that day and the sun glistened on the bottom even at 100fsw. I asked myself if I felt at all narc'd, and I did feel relaxed—probably a bit narc'd, but was able to keep my wits about me, and focused on keeping good buoyancy control. It seemed like a long leisurely dive, since we essentially slithered our way up the bottom contour of the island looking at everything along the way—the usual urchins, horn sharks, and back then abalone, bryozoans, gorgonians,

sheep head, garibaldi—Catalina's finest! We surfaced and had a short swim back to the boat. We made a couple more dives that day that were significantly shallower—about 40fsw max. All in all it was a relaxing fun day of diving. Over the next few days, I noticed a feeling like I had a crick in my right shoulder that I couldn't seem to work out. I'd stretch and twist, but nothing seemed to help—not even massage. I just thought that I probably pulled a muscle in my shoulder hoofing my dive gear to and from the boat. The weekend after I'd gone on my 100fsw dive, I decided to ski in Big Bear with a friend. She was asking all about my dive experiences as we were driving up the mountain, when I began to notice that the pain in my shoulder was getting worse—in fact it was radiating up my neck into my jaw and down my back some, too. Then it dawned on me that this wasn't a pulled muscle at all, but in fact must be due to a bubble in the shoulder muscle that was now getting bigger and bigger as we went up in altitude driving up the mountain. My friend was chatting away, when I said, "Turn the car around. We need to go down the mountain now." She was surprised at first, until I explained what I was experiencing. As we descended, the pain began to diminish. Ahh, the definitive test! Yikes! This must be DCS! How could that be, I thought, since I hadn't done anything wrong! We got to the bottom of the mountain, and I got to a pay phone (no cell phones then), and I called the Dive Alert Network. I had DAN Insurance, since my instructor had insisted that we all get it. I certainly didn't think that I'd ever have to use it! I explained to the Medic on the line what had just happened, and he instructed me to go to UCSD Medical Center where there is a chamber and a doctor who specialized in Dive Medicine, Karen Van Hoesen, M.D. Dr. Van Hoesen indicated

that it was rare to hear of symptoms a week out, but then again said that it appeared that I'd had symptoms not too long after the dive, but hadn't put two and two together that the "crick in my shoulder" was a symptom of DCS. She was concerned that I might not get relief from treatment in the Chamber at this late date, a week after the dive, but felt it was imperative to try. Entering the Chamber was truly a unique experience. First of all, I had to change into cotton doctors' scrubs and put on cotton booties too. A nurse also dressed the same and accompanied me into the Chamber to stay with me throughout the treatment. The Chamber has high oxygen content and we needed to dress in cotton, a fabric that wouldn't create any static electricity that could potentially spark and cause a fire inside of the Chamber. As the Chamber was pressurized it got quite cold, and I was told that I would undergo periods of 20 minutes of 100 percent O2 with air breaks in between. When I received the 100% O2, I had to wear a clear plastic hood that enveloped my head and sealed around my neck. It was very bizarre to have my head inside of a bubble. I was also instructed to let the nurse know if I felt strange in any way. This was because breathing 100% O2 can lower the seizure threshold, and you can have a seizure. This can be avoided if you look out for feeling strange or feeling a little nauseated or headachy which can be the aura or signal that you are about to have a seizure. There were a couple of times that I did feel strange and then the 100 % O2 was stopped before the 20-minute period was completed. I did clearly feel a reduction in the pain in my shoulder when the Chamber was pressurized—which is diagnostic of DCS. I was in the Chamber for a total of about 6 hours. Basically the nurse and I knew each other's life stories by the end of the Chamber Ride—and boy did we laugh. Maybe we were a little narc'd at times. Once the treatment was complete, Dr. Van Hoesen and I again reviewed everything I'd done before the dive to try to find a cause for the DCS, and nothing could be found to be the cause. She checked my computer profile too—and said it was just fine. So, it is possible to "get a hit" no matter how careful you are.

By the way, just a reminder, DCI stands for Decompression Illness and encompasses both Decompression Sickness and arterial gas embolism. Decompression Sickness is a consequence of bubbles that form within the tissues, and arterial gas embolism occurs when air enters the arterial system. This occurs when air can't escape through the bronchi and gets forced into the arterial blood—for example, when a diver holds his/her breath, or when air gets trapped due to a respiratory infection or from asthma or emphysema. Interestingly, the stats are, per a 1995 Scientific American article by Richard E. Moon, Richard D. Vann, and Peter B. Bennet that in the U.S there are about 900 reported cases of Decompression Illness reported per year.

Although the incidence isn't known in the U.S., it is estimated that worldwide about one per 5,000-10,000 dives results in DCI amongst recreational divers.

But, what is even more interesting is that most of the cases are not due to reckless diving...

And, it was also discovered at the Dive Alert Network that 50% of those cases of Neurological DCS showed up as having a patent foramen ovale. This is a defect of the heart in which there is an opening between the right and left atria of the heart allowing bubbles to bypass the lungs and go straight to the brain, which can result in trouble with vision, speech, thinking, personality, or consciousness. It makes you wonder if it would be smart to get tested for this. In fact, I have gone for this test just to be sure that I'm not at risk of DCI from patent foramen ovale—as it is a heart defect that one can live with for years and never know that you have it. The test is very simple. It's essentially an echocardiogram of the heart in which a small amount of bubbles are injected into an IV and the echo detects any flow of the bubbles across the septal wall that separates the right and left atria of the heart.

So, although getting DCS may not be entirely preventable, it is worthwhile taking necessary precautions such as being well hydrated, and well rested, and avoiding intense exercise after diving, ascending slowly at a rate of 30 feet per minute, and doing a 5 minute safety stop at 15-20 fsw before ascending. A Dive Alert Network Study indicates that doing the safety stop reduces venous bubbles by 50%. Also, it's important to know the symptoms of DCI and not be afraid to speak up about them and get any suspicious symptom evaluated. There's no harm in calling DAN when you first notice a suspicious symptom to run your situation by them—they'll advise you what's best to do next.

So, my naiveté and tendency to brush off a symptom, even though it didn't make complete sense to me that my shoulder pain wasn't getting better, kept me from contacting DAN sooner than I did. I have definitely learned my lesson.

Bob and I will share another interesting story about DCS at this month's Dive Club Meeting—so join us to see what happened. And remember: never be afraid to speak up and ask questions about how and what you are feeling after a dive. DAN is a very helpful organization—and you'll see even more why we say this after you hear our presentation at this month's meeting.

As always, Happy and Safe Diving!

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