Brain Lesions

A hidden heart defect raises the risks

A few years ago researchers discovered that a tiny hole in the heart that affects about a quarter of the population increases one's susceptibility to the bends.

Now, researchers from the University of Heidelberg found that some frequent divers who seem to be perfectly healthy have brain lesions — and those with the tiny hole are at most risk of the brain damage.

The hole, known as a patent foramen ovale, exists when a fetus is developing, but for most people it closes at birth; in about a quarter of the population it stays open and in some cases the opening is big enough to let blood clots or air bubbles through.

The researchers used magnetic resonance to study the brains 87 divers with an average of more than 500 dives each. "A total of 41 brain lesions were detected in 11 of the 87 divers," they reported in the *British Medical Journal*. "The three divers with multiple brain lesions were nonsmokers, aged in their 40s, and did not have any other multiple risk factors." What was different was that they had the little holes.

"The association of multiple brain lesions with a large patent foramen ovale supports the hypothesis that the brain lesions were due to arterial gas embolism during or shortly after decompression," they wrote.

Peter Wilmshurst, a cardiac consultant at the Royal Shrewsbury Hospital in England, told Reuters news agency that divers with the defect could give up diving, stay in shallow water, or not stay down as long as other divers. Ultrasound scans could show whether divers had the PFO and they could choose to have surgery to close it.

Dr. Kelly Hill (who is with Our Lady of the Lake Medical Center in Baton Rouge and medical columnist for NAUI's *Sources*) told us that the study seems to indicate that divers with PFO are "in danger of suffering brain damage to some degree. Since the brain never heals, no damage is better than some

An Alternative to Shallow-Water Drowning

Shallow-water drowning secondary to surface-airway submersions is typified by the following quotation from Dive Alert Network's "Report on Diving Accidents and Fatalities," 1996 edition, pp. 94-95.

DAN RECORD NO: 294

CAUSE OF DEATH IMMEDIATE: Drowning / nonfatal submersion

"The decedent was a diver of moderate experience with a 14-diver group on a charter boat. The sea conditions were marginal and several divers had difficulty. The decedent was low on air but not in immediate difficulty and was escorting another diver who was in trouble and required rescue by the boat crew and divers. When that emergency was over, it was recognized that the decedent was missing. The search revealed her floating face down in the water with BC inflated."

Every buoyancy compensator (BC) — vest-style, back-mount, or horse-collar — particularly when partially inflated, is capable of side high-airway submersion. This position can be aggravated by cylinder selection. The vast majority of steel and all-aluminum cylinders need an attached counterweight for reliable self-rescue.

The Dive Alert Network's review of 2,500 fatalities shows that 50 percent of the drownings occurred on the surface, 90 percent of them while the divers were wearing their weight belts. Unconsciousness is the great equalizer: the instructor-trainer equals the novice, the 30-year expert equals the irresponsible uncertified diver. All that stands between the distressed diver and airway submersion is the diver's gear.

Ballast Mediated Airway Protection (BAMP) is the nonreleasable attachment of a small amount of ballast onto the tank to offset the BC's side buoyancy, conferring emergency surface flotation or self-rescue.

In 1996, Scuba Pro, Forte, Zeagle, and Brownie's Third Lung reintroduced tank-mounted counterweights. Forte's is integrated into one model's BC tank band. Scuba Pro's is an option available for one of their products. Zeagle's optional tank-mounted weight system is said to fit all models of their BCs. Brownie's counterweight is a stand-alone system that will retrofit any BC with airway protection and is the only product supplied with adequate instructions.

William L. Courtney, M.D.

This article first appeared in Pressure, *a newsletter published by the Undersea and Hyperbaric Medical Society.*

damage." Hill says the number of divers found with lesions "gets my interest because it is higher than I would expect," but he adds, "This is only an indication of a potential problem; the studies are still inconclusive."

Because the cost of an MRI on the heart is roughly $1,000, Hill says, "it's too much to ask for routine checks. However, he said, "when someone comes through our chamber with a bad hit and indication of potential neurological problems, I recommend an evaluation for PFO. While research hasn't proved that PFO is a major problem, the studies that have been conducted indicate that something is going on."

Ben Davison

Why British Divers Die

Accident reports from the other side

Unlike American certification agencies, the British SubAqua Club doesn't avoid reporting on injured and dead divers to make diving seem as safe as stamp collecting. In fact, they make their reports public so divers can learn from errors to become safer divers.

From their 1996 report we wish to cite a few injury cases so we all can learn from the unfortunate few who erred and got hurt.

Too often at the end of a long dive someone has to return to the bottom to free the anchor. This British instructor went to 55 feet, but had 12 minutes of stops as he surfaced with his students. He then reentered the water to 45 feet to free the anchor, which had gotten stuck. He exerted himself, surfaced rapidly and out of breath, with bends resulting. Recompression treatment resolved the problem.

While this case seems almost like one noted urban myth, it indeed happened. During an ascent from a wreck, a diver was hooked by a fisherman and dragged toward the surface. Every so often the fisherman let the line go slack and the diver sank again. The diver s buddy finally managed to cut him free, but he made a rapid ascent to the surface.

One nightmare ascent involved two wreck divers. One tied a line to a wreck and released the buoy in preparation for their ascent. The line did not run freely, so they detached it from the wreck, but it caught one diver's thumb and pulled him rapidly upward as the buoy rose. The divers were attached to each other by a buddy line, so both were carried to the surface, shooting past a five-minute required stop.

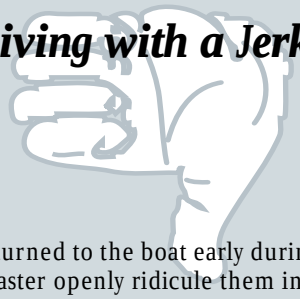
American reports never talk about out-of-water injuries, but they occur. And they ain't fun.

While getting out of his gear, this Brit bloke had a clip on his BC break, causing the whole rig, tank included, to drop to the earth. His big toe was in the way and the tank fractured it.

Two fully dressed divers were walking toward the entry point for a dive. Their route down some steps was blocked by a group of school children. In trying to negotiate past them, one diver fell and broke his leg.

Finally, there were two blokes who drifted off their anchor line, got to the surface, and had no way to attract attention. A simple safety sausage would have gotten attention, but they drifted nearly three miles out to sea where, by sheer luck, they were spotted by another dive boat. ■

Diving with a Jerk



Kendall Botellio (Phoenix) led a group of 14 to Little Cayman Beach Resort last September. They found the food excellent and the wall diving world-class. It was a good trip, marred only by the insensitive behavior of one of the divemasters.

Two neophyte divers in Kendall's group returned to the boat early during one dive. There they had to listen as the divemaster openly ridicule them in a conversation over the boat's radio: "You wouldn't believe the basket cases I have on my boat."

Anyone who has paid hard-earned money, traveled far, and used valuable vacation time will find this kind of treatment from a member of the resort staff inexcusable. We were all beginners when we started diving — including this boorish divemaster. His condescending attitude and behavior earn him a richly deserved thumbs down.