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SEVEN GREEN DIVERS HANGING FROM A LINE A case reported to Project Stickybeak

Douglas Walker

There was nothing to indicate that this was to be anything other than an uneventful dive. The divers were taking an Advanced Diver Course under the care of an instructor and in the dive boat there remained two men with coxswain qualifications. There was 15 m (50 feet) visibility underwater, the dive was to be to 27 metres for 20 minutes, and there was to be a decompression stop at 5 metres, this being a routine precaution even when the proposed dive was within no-decompression limits. The "stop" was to be taken on a line suspended from a 20 litre plastic buoy with the group remaining together at all times. To prevent uncontrolled fluctuation of diver depth during the decompression stop due to the surge at the surface, the divers were advised to be slightly negatively weighted rather than aiming for neutral buoyancy at the surface.

The dive progressed as planned and the group of eight then clustered on the shot line at 5 metres for the 5 minutes planned. It was only after the instructor had twice needed to equalise his ears in the four minutes they had been hanging on the line that a suspicion rose in his mind that this was somewhat unusual so he checked his depth gauge. It read 15 metres. He looked up and saw that the buoy had been pulled underwater by their weight: it was now visibly indented by the pressure and was consequently now providing even less buoyancy lift to the eight divers. Though he at once started trying to indicate to his pupils that they had to let go of the line this took time, and after obeying this order they lost the buoyancy it had provided so sank deeper until some, if not all, returned to the sea bed.

One of the divers, A, now found that he was low on air and started breathing from the octopus regulator of diver B after indicating his need. The instructor saw that they were connected only by the air hose and put them into the correct, and safer, hands-on contact position before they started their ascent. He then saw another pupil swimming over the sea bed unable to reach the inflator hose and apparently lacking sufficient buoyancy to start ascending. After ensuring the vest's inflation he ascended with this diver and surfaced uneventfully.

On surfacing the instructor found that all was not well as divers A and B had surfaced in distress and were requiring an urgent resuscitation management. At this time there was still one diver not surfaced but fortunately this diver soon returned after completing the planned, but interrupted, 5 minute stop at 5 metres. Witnesses had seen A and B surface then float quietly face up and unresponsive. When the boat reached them one was able to make some response but the other was ash-grey faced and blood was seen in his face mask. They were quickly taken from the water and into the dive boat where A was noted as cold, breathless, and ashgrey faced, with chest pain and tingling fingers, and he was immediately placed in the Trendelenberg position and oxygen commenced. He had these symptoms when the boat reached harbour and he was airlifted with his buddy to a hospital having a hyperbaric unit. However as he appeared to have recovered by the time he reached the hospital and his buddy was similarly well they were both allowed to return home after a short period of observation.

These divers had apparently made an out-of-air ascent from an unstated depth (possibly 5 metres) because the octopus had soon exhausted the buddy's remaining air. They were observed to "pop to the surface". Diver B admitted that "he had held his breath" as he ascended. At the surface he was breathless and felt anxious but far less effected than was diver A. He had retained his weight belt. His scuba diving experience is unknown but diver A had been diving for one year.

When he got home diver A felt very tired and this tiredness was still present the next day after a good sleep so he went back to the recompression unit and on this occasion it was agreed to recompress him. This completely removed his feeling of fatigue and it did not recur. floating out of reach.

This incident commenced because the instructor made a decision intended to increase the safety of the group of divers as they waited out the decompression stop together on a shot line. The need to check that the buoy provided sufficient buoyancy when eight divers hung on the line was not recognised. Compression of the buoy as it was pulled underwater aggravated the situation. There was an acute and unexpected worsening of the situation when the dive group followed instructions and released themselves from the line and sank deeper as soon as the uplift it gave was lost. The group was no longer facing an expected situation and may then have been scattered to some degree, although the good visibility enabled the instructor to see what was happening. In these circumstances this instructor exercised as effective control as anyone could expect, but the group was too large for a single person to fully control. He ensured that divers A and B established effective hands-on contact before commencing their ascent and could not have altered their risk of running out of air because at that time most of the divers were probably down to a similar remaining-air and his assistance was required by the diver whose vest inflation control was

The response of the persons in the dive boat when they saw divers A and B "pop" to the surface and then float motionless was completely correct. Possibly less so was the medical decision to discount the incident history, which suggests that cerebral air embolism may have complicated a lung-overpressure episode, as soon as the two divers appeared to be fully recovered. The development of decompression sickness by diver A, indicated by the excessive fatigue he felt, might have been clinically suspected while he was still at the recompression facility had there been a higher index of suspicion applied.

This incident indicates the rapidity with which any diving situation can change from the uneventful to the potentially fatal after a single additional adverse element in a dive already containing several "silent" adverse factors. In retrospect it is clear that the surface float provided inadequate buoyancy, that one instructor cannot control seven pupils should a problem arise involving more than one of them, and that it remains true that careful divers should know enough to diagnose their own diving-related problems and be prepared to maintain such opinions if necessary even in the face of dismissive medical opinions. The incident could have led to two fatalities. The triad of Archimedes, Boyle, and Murphy must never be forgotten when using a "sky anchor" for a shot line.

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witness the ultimate in justice, lawyers being sued for the effects of their case law medicine on the management of a patient. But do not hold your breath waiting for this to happen.

Until that day there is the risk of being sued by a disgruntled diver either because an "ordinary" long bone survey was performed instead of scintigraphy, or on the grounds that it was totally unreasonable to refuse to issue a certificate of fitness, because some bone changes had been found, thereby depriving the diver of his livelihood. Naturally failure to act on a finding of such changes will be actionable also. This threat to practitioners of diving medicine can only be contained when we have a database containing far more information than is now available, as decisions can then be defended from a secure foundation of case histories. Lawyers have a great respect for precedent but it will be up to us, the medical and diving community, to collect case histories and to define the areas of uncertainty where suppositions reign.

Among articles reprinted are what to do when embraced by an overinflated buoyancy compensator. Some regular divers will recognise the feelings of the occasional diver whose musings appear on page 202. And those who entrust their bottom time to a computer may get a tip or two from Bill Lovin's sad story on page 201.

SOUTH PACIFIC UNDERWATER MEDICINE SOCIETY 18th ANNUAL CONVENTION

PALAU PACIFIC RESORT 31 May - 9 June, 1990

Members wishing to present papers should contact the organiser of the Scientific Meeting.

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