

THE GP'S ROLE IN DIVE ACCIDENT MANAGEMENT

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Key Words

Accidents, case report, decompression illness, rescue, sequelae, transport.

Introduction

Many people dive around the North Island of New Zealand which has a magnificent coastline. Our varied geography, with deep diving available at a string of excellent offshore island venues as far as the Three Kings in the far North, can present acute diving emergencies at any time and in isolated areas surrounded by hills and mountains.

The GP's role

Before the accident the GP can screen diving candidates to reduce their chances of becoming an accident. Local knowledge of diving sites can be useful when advising novices and when an accident occurs. Prescribing for divers needs care to avoid harmful side effects. Being aware of diving illnesses and knowing their treatment prepares the GP to handle diving accidents better. Knowing the Royal New Zealand Navy (RNZN) Hospital telephone diving emergency number (09-445-8454) makes contacting expert advice easy.

At the time of the accident the GP can be involved in First Aid and in diagnosing the problem. The informed GP is the person to contact expert advice about further treatment and decide how to act on the advice. This will involve organising transport, stabilising the patient's condition for transfer, arranging for recompression therapy, giving oxygen and fluids and keeping clinical records of the patient's condition, drugs given and fluid balance.

After the accident the patient needs to be followed up. A minimum is at one week, at one month and one year. This latter interview should include an interview with the spouse, who is the most sensitive detector of mental changes in the diver since the accident. Adequate support and medical assistance to a damaged diver may require much more frequent follow up. The other important post-accident service to the patient is keeping him or her from diving, or flying, for at least a month.

Table 1 summarises the ways that GPs can help their patients after a diving accident.

GP ROLES IN DIVE ACCIDENTS

Before the accident

- 1 Screen dive trainees
- 2 Geographic knowledge
- 3 Awareness of diving illness.
- 4 Prescribe carefully for divers
- 5 Know RNZN Hospital telephone number (09-445-8454)

At the time of an accident.

- 1 First Aid
- 2 Diagnose the problem
- 3 Communication with expert advice
- 4 Reach an informed decision about treatment.
- 5 Organise transport
- 5 Stabilise for transfer/treatment at RCC
- 6 Give oxygen and fluids as appropriate
- 7 Keep records of clinical state and drugs/fluids given.

After the accident

- 1 Follow up at 1 week, 1 month, 1 year (with spouse)
- 2 Support and medical assistance
- 3 No diving nor flying for 1 month minimum

Discussion

Divers get into trouble at sea or in lakes and local GPs are often involved in the first aid treatment. This is helpful in assessing fluid administration and in accurate observation at a distance from the centre where definitive recompression may be offered. If these doctors are aware of hyperbaric principles this contact is valuable, but those who know little or nothing about diving medicine (which can include A&E house surgeons) may misdiagnose and cause delays in transport.

Land evacuation has to be weighed against air evacuation before evacuation is arranged. In the meantime the highest possible oxygen concentration should be administered and hydration kept up. Networking local knowledge with the Naval Unit Medical Team's desire for stabilisation and rapid transport, where indicated, is the aim.

Recreational divers often present late. They may not mention that they were diving several days before and the diagnosis can be elusive. A high index of suspicion is needed to avoid missing diving related problems. Inner ear pathology may well be not reported by patients unless the symptoms are specifically asked about.

For severe disease rapid transport to a hyperbaric facility, after stabilisation, is indicated. This is even more important when symptoms of DCI appear early. New Zealand's geography means dive locations are often remote and separated from Auckland by mountains. Helicopters, being able to keep below 300 m, and some fixed wing aircraft, which can be pressurised to ground level, may have advantages over land transport by car or ambulance.

In the early 1980s in the Northland area we instituted a local service based on St John's Ambulance notification. Now the Westpac helicopter service, which is co-ordinated from Auckland, has replaced the original scheme. The main disadvantage is the lack, in Auckland, of local knowledge of the geography. Paramedics now attend emergencies and diving doctors are no longer used. In some cases helicopters are, in fact, a slow option because of delays in reaching the patient when the helicopter is already in use elsewhere,

Helicopters enable access to remote areas, Northland is now being serviced from Auckland by the Westpac Squirrel or from Whangarei by the Northland Emergency Services Trust (supported by Northpower) using a Kawasaki BK117 helicopter. These are expensive, limited for space, but well equipped with resuscitation gear. If the patient is acutely unwell and unstable, helicopters can be a less safe option than an ambulance which has room for on-going resuscitation and treatment by a doctor.

The following case illustrates some of the problems in Northland.

Case report

In March 1984 a 20 year old man, an experienced diver, entered the water at 0930 off the Cavalli Islands, about 225 km, as the crow flies, north of Auckland. The previous day he had dived to 24 m for 25 minutes. He dived to 27 m, swimming hard in a current, for crayfish, for 17 minutes. On the surface at the end of the dive, he was conscious and inflated his buoyancy compensator. He developed pins and needles and numbness, then lost consciousness for 2 minutes. He did not vomit or cough up blood.

In the previous 2 years he had noted paraesthesias and elbow pain on at least 3 occasions after diving, and had done at least one bounce dive to 69 m. He had had a normal chest X-ray 5 days before the accident. As a result his GP advised that he was safe to dive, although he had had a cough and recurrent chest infections for 6 months before his accident.

He was rapidly taken by boat to Te Ngaere Bay, a distance of some 10 km. Assistance was sought by CB radio en route, advising the then Winfield helicopter service at 1000. An ambulance met the boat and oxygen by

mask was started 30 minutes after surfacing. He was conscious in an ambulance to Kaeo Hospital, a journey of about 15-20 km. His breathing had become laboured 1 hour post dive. The helicopter arrived at 1330, 3 and a half hours after being notified. By this time he was unconscious again and needed stabilisation to travel. The helicopter was low on fuel so they flew about 50 km north west to Kaitaia to refuel. They flew to Auckland down the West Coast, stopping about every 15 minutes to allow the paramedic to reassess his condition. The helicopter covered about 250 km to reach the Royal New Zealand Navy Hospital at 1600, six and a quarter hours after he surfaced.

He was recompressed, then had to be decompressed early because of increasing respiratory difficulty and transferred to the Critical Care Unit at Auckland Public Hospital. He survived as a T6 paraplegic. His marriage failed after his accident. Sadly his accident was before the ICU-under-pressure facilities were installed at the Slark Hyperbaric Unit.

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EVACUATION METHODS IN DIVING INJURIES

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Key Words

Accident, transport.

Introduction

The evacuation and retrieval of diving injuries is an unavoidable issue for those involved in the treatment of decompression illness (DCI) in the recreational diver and is likely to remain so for the foreseeable future. This is because civilian hyperbaric facilities in Australasia are relatively widely scattered and the best dive sites are often remote from a treatment chamber. This means that acutely unwell divers will require transfer over considerable distances in order to reach definitive care. This paper outlines the principles involved in selecting the appropriate transport and illustrates some of these with reference to recent cases at the Prince of Wales Hospital.