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“NO TECH” TECHNICAL DIVING: THE LOBSTER DIVERS OF LA MOSQUITIA

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Key Words

Deaths, deep diving, decompression illness, equipment, occupational diving, treatment.

La Mosquitia includes the south eastern area of Honduras, and the north eastern area of Nicaragua. This area is extremely remote, with no access except by boat or plane. The land is rain forest and savannahs, traversed by many rivers which meander to the Atlantic.

The population of La Mosquitia in Honduras is about 40,000, with the majority of the people belonging to the Miskito Indian tribe. The main source of income for the entire population is lobster diving. Alternative income is derived from fishing and a minimal amount of agriculture. In Nicaragua turtles are fished for local consumption legally, but none can be sold outside the area. There is no tourism in La Mosquitia, but the potential for an “eco-tourist” industry is unlimited.

The lobster fishery started in the early 1960s and was exclusively free-diving. The lobsters were sold to the processing plants which are in the Bay Islands of Roatan and Guanaja. By the late 1970s lobster could not be found shallow enough for free diving and the lobster boats out of Roatan and Guanaja began supplying the Miskito divers with tanks and masks to take lobster. They had no knowledge of diving physiology or safety and they began to dive deeper to find the lobster. By the early 1980s, dives to 27 to 33 m (90 to 110 feet) were commonplace. The total number of dives a day would be from 9 to 20.

Originally the divers learned to dive by observing other divers. The boat captains supplied marijuana and rum to the divers before each dive, as it would “Help them to see the lobster better”. If a diver returned to the boat with paralysis, it was thought that he had the mermaid’s curse on him. If he survived to the mainland, he was often taken to a witch doctor or herbal doctor. When he finally make it to one of the chambers, there was the added delay, plus possible complications from the treatments of the witch doctor.

Many paralysed Miskito divers are being treated at the Episcopalian clinic at Anthony’s Key Resort in Roatan, where a 54 inch (1.37 m) deck decompression chamber was donated to the island in the late 1980s. As of 1995 around 1,000 divers have been treated in this chamber, with 90% of the treatments being given to Miskito Indians.

A Moravian church clinic in Ahuas, a small village about 40 km (25 miles) inland, was also being inundated with paralysed divers. The director of the clinic contacted me in 1989. Los Robles Regional Medical Center in Thousand Oaks, California, donated an old Vickers monoplace chamber to the Clinica Evangelica Moravia in Ahuas in 1991. Since that time well over 200 Miskito divers have been treated in this chamber.

The average delay to treatment is about 5 to 7 days. Approximately 70% of the divers have severe decompression illness (DCI), with paraplegia or quadriplegia as their presenting symptoms. Another 20 to 25% present with moderate symptoms, including bladder dysfunction, paraesthesias and weakness in the extremities, ataxia, and pain. The remaining few are mild cases.

In spite of the delay to treatment, the severity of the cases and the limitations of the old monoplace chamber, statistics from the clinic show about 65% of the divers respond with good to excellent outcomes, 20% fair outcomes, and only 10 to 15% with poor or no response. Unfortunately, no neuropsychological or neuro-imaging tests are able to be done on these divers.

Examinations have been performed on “normal” lobster divers which reveal abnormal neurological findings in all those examined. It is felt that virtually 100% of the diving population has at least a mild form of decompression sickness. It has been estimated that one or two divers on each boat develops severe DCI. The total number of deaths in the diving population is not well documented, but it is not uncommon to have deaths from shark attacks, air embolism, out of air events and probably carbon monoxide (CO) contaminated air.

Those divers who have not been treated in the chambers, or who have had poor responses, are often abandoned by their wives and die within four years from kidney infections secondary to self catheterisation, or from infected bedsores (decubitus ulcers). Their wives frequently turn to prostitution to provide a living for their children, and the incidence of sexually transmitted disease is on the increase. This is a tragedy which involves the entire population of La Mosquitia.

As an outgrowth of articles written about this problem, others have become touched by this situation, including Bob Izdepski, the editor of *The Universal Diver*. He has written articles in this newspaper about the appalling situation in La Mosquitia, which have stimulated others in the commercial diving industry to offer aid.

CalDive has donated a 48 inch (1.2 m) recompression chamber for La Mosquitia. Bob Armington,

a retired commercial diver, moved to the area and opened up a diving school for the Miskito Indians, funded by the Moravian Church, and the association of lobster dive boats in Guanaja. A non-profit organization has been started by Bob Izdepski called SOS (Sub Ocean Safety) which is accepting donations of both material and money to continue working towards helping with the diving problem in La Mosquitia.

So far SOS has filmed a video concerning in-water recompression to be utilised in the diving schools, and transported the 48 inch (1.2 m) chamber to a coastal clinic in La Mosquitia. A compressor has been donated by Oceaneering, and DAN (Divers Alert Network) has donated \$2,000 US to SOS. These funds were used to rebuild a Lister engine to drive the compressor. The physician at the clinic will be instructed in diving and hyperbaric medicine by the three diving medicine specialists with SOS, Dr David Youngblood, Dr Keith VanMeter and myself.

Members of SOS have been researching the statistics of the lobster industry in Honduras. There were a total of 262 lobster boats in the Bay Islands, 70 of which dive for lobster, and the rest trap lobster. The average lobster diver makes about \$US9 a day, although many do much better. The trips last about two weeks, and they can make as much as \$US750 on a good trip.

In the last two years, the skippers have been teaching the divers about the proper size of lobsters and this year less than 5% of the take are undersized. Their project for the next season is to make sure females with eggs are not taken.

The government has imposed a four month ban on lobster fishing the last two years, and the net yield of lobster last year has been the highest in the past decade.

If a diver is paralysed, the lobster boat owner must pay him, for a year, the amount of money the diver made the day before he was injured. If the diver has not recovered, the boat owner must pay a "death settlement", which is equivalent to three years' wages.

For this reason, as well as not wanting to be responsible for another human being's death, the organization of lobster dive boat owners has written a list of standards, which they have asked the Ministry of Fishing to make as law. These standards include having clean filters on the boat's compressors; separation of the compressor's exhaust from the air intake; tank inspections every third trip; oxygen on each boat with a face mask to deliver the oxygen to an injured diver; divers to have their own depth gauge and pressure gauge (which they do not use now); every boat utilising at least four trained divers (600 of the estimated 5000 divers will have been trained by July 1996); a 3 mm (1/8 inch) or equivalent short type of wet suit.

They would also like to have every skipper take a week's "crash" course on diving, so the skippers have some idea of what the divers are doing. The skippers and the instructors at the dive school are urging the divers to stop using rum and marijuana before their dives. Tobacco and rum are used in La Mosquitia from childhood and it is taking a large effort to decrease their use of these.

Plans are being formulated for several studies on the long term effects of untreated decompression sickness from both a physical and a neuropsychological standpoint using the large population of divers from La Mosquitia as well as several other Caribbean islands where the same problems exist. A second study is planned using the many injured divers presenting on each boat. We are contemplating using on-the-site treatment of injured divers, alternating in-water oxygen recompression therapy using the Australian tables, versus emergency treatment with oxygen in a portable 2 ATA chamber which will also be on the boat. After initial emergency treatment, the divers will receive standard recompression therapy at the main chamber in the nearest clinic. Statistics will be kept to see which is the most effective treatment, on site surface oxygen, in-water oxygen recompression, or emergency 2 ATA chamber oxygen.

Similar problems are occurring in many other areas of the Caribbean, as well as many other third world areas where the lure of money outweighs the significant risk from DCI in untrained divers and uncaring boat operators. Hopefully the work of Sub Ocean Safety and other interested groups can continue to make a positive impact on these areas in the future.

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ROUND WINDOW MEMBRANE RUPTURE IN SCUBA DIVERS

Noel Roydhouse

Summary

Since 1971 the author has examined 19 cases of round window membrane (RWM) rupture and one case of oval window rupture caused by scuba diving. They consisted of 8 cases operated on and in which flow of perilymph was seen (Group A), 2 cases operated on and an intact RWM and oval window annular ligament (OWAL) were seen