

SPUMS 1983 SCIENTIFIC MEETINGTHE WAIGANI EXPRESS

Ian Lockley

This film is about the salvage of the Waigani Express. The Waigani Express is a container ship, German owned, German officered, and Papua New Guinea-national crewed. She was on a run from Australia to Port Moresby, when they forgot to turn the corner, literally, and took up their selection on the reef at full speed, within sight of a lighthouse. A lot of people have asked how do accidents like this occur? It was quite simple. The officer of the watch was being entertained by the rather gorgeous blonde German radio officer. The lookout, who came from the village which was just beside the lighthouse, was not prepared to go and disturb the First Officer, because he was not quite sure what they were up to. This accident happened on the fourth of July 1981. It certainly was not Independence Day for the crew of that ship. They spend the next four weeks working hard with myself and our team battling, not only the elements, but the German owner, who was an ex-U-boat commander. If anybody was difficult to work with, he took the cake. I think the film shows some of this.

The camera man, Lynton Diggle from New Zealand, did an excellent job. He was able to get his camera into some spots where it was not always appreciated, sometimes under threat of the film being destroyed. But we did persevere and asked him to persevere, because the film was taken primarily for arbitration. The major part of our reward and remuneration for salvage is decided by an arbitrator appointed by the Committee of Lloyds of London. The more we can show him exactly what happened, the easier his job is.

This U-boat commander decided to take it one step further after we re-floated the ship. He transferred the ship from one group of owners to another, then managed to convince Lloyds that it had been very badly damaged and received a settlement for repairs. Then he promptly went to another shipbuilder, who gave him a quote that was about one third of the first one. We were able, with some of the evidence which was on the film, to typify the sort of man he was and prove that this had happened, and have our salvage value increased. This of course, hopefully, increases our reward. Even though this operation took place some two years ago, we have still not been paid for it. This gives you some idea of just how long the process of arbitration can be.

Those interested in seeing this excellent film should contact:

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DECOMPRESSION SICKNESS
THREE CASE REPORTS FROM THE
CARIBBEAN

Grahame Barry

When we first start off doing diving medicine, we think we can cure all people who have the bends, air embolism and so on. But the more conferences we attend the more we are regaled with horrendous stories of totally failed treatments and people ending up crippled. So to start this conference on a happy note I am presenting two marvellous cases of 100% success. One resulted from the right people doing the right thing in the right place at the right time and the other was probably due to sheer good luck, but nevertheless had a very successful outcome. Neither of these cases is mine, mine is the third case, with the bad result.

The first two cases were dealt with in Trinidad, by a group which I worked with. I think they are fascinating cases, not that they raise any great problems, but show that if one does do the right think, one can do some good.

CASE ONE

In 1976, an inexperienced diver, who was working for a commercial diving company, made a working dive to 70 feet of sea water (fsw). Every now and then horrendous things happen, and these things started to happen in this case. There was a foul up in his air line after 90 minutes at depth. Furthermore he could not get the safety bottle free from his down line. Also, just to make things a little more complicated, he could not get himself free from his harness. His co-worker was on the ball and they buddy breathed from 70 feet to 40 feet, at which time the buddy's air ran out. So the buddy made for the surface, leaving the patient airless and tied up on the down line.

The buddy reached the surface and gave the news to the diving superintendent. The superintendent, who was also on the ball, put on scuba gear and went down. He found the patient at 40 feet still tied to his lines and unconscious. He brought him to the surface, where CPR was at once begun. The patient, on reaching the surface was reported as having no pulse and no respiration. However, within one minute of starting CPR the pulse returned. Two or three minutes after surfacing, the patient was trying to breathe and then vomited. Within five minutes, the patient was put into the recompression chamber (this was a commercial diving operation, so they had a chamber on site) and taken to 10 feet of sea water for thirty minutes.

By then he was conscious and vomiting, his pulse was stronger and becoming regular. After thirty minutes at 10 feet he was taken out of the chamber and transported by launch and ambulance to a hospital, breathing oxygen by mask all the time.

In the hospital, his clinical examination was entirely normal and the patient felt well. The X-ray of his chest was normal, his blood gases were normal, and his electrolytes were normal. The man was discharged two days later.

I am presenting this as an example of saving a life by prompt CPR and the avoidance of decompression sickness by giving some sort of hyperbaric therapy plus oxygen on the surface. The doctor who saw him in hospital assumes that he probably had glottic spasm, which prevented sea water from entering his lungs and that the increased partial pressure of oxygen in the lungs at 40 fsw kept his physiology going during the three or four minutes until CPR was begun at the surface. In any case, three cheers for all the people involved.

CASE TWO

The next is perhaps the most magnificent case that I have ever heard of. It concerns a diving casualty in 1977 in Sequin, which is a small island in the West Indies. A 23 year old Negro male, who was physically fit, went diving for lobster, as had been his custom for the past seven years.

At 7.30 am with a single 72 cubic foot tank on his back, with neither depth gauge or watch, because he had not heard of these, he dived to about 90 feet (his own estimation), looking for lobsters. He stayed down for about fifteen minutes (again estimated), surfaced, using no decompression schedule, which indeed, according to the tables, he did not have to. He rested for three or four minutes and then repeated the dive. He would have had 20 minutes "residual nitrogen time" when he came up, so he went down already over the limits of a no-stop dive.

He repeated three such dives, with a surface interval of about three to five minutes between each dive. He was obviously a very careful fellow, because on the third surfacing he rested for seven minutes, feeling that if he rested twice as long, he would probably be alright. So in all he made approximately four dives to between 90 and 110 feet, with bottom times of approximately fifteen minutes each. I tried to follow this in the tables and lost it after the second dive.

As he was surfacing from the fourth dive, a large fish attacked him. He threw caution, but not his lobsters, into the water, and made for the surface as fast as possible, holding his breath. He escaped the fish, he also escaped the air embolism, but it was not third time lucky, it was fourth time unlucky as he did get decompression sickness.

He came ashore having got enough lobsters. After fifteen minutes ashore, he developed chest pain. This was at about 1130, about three hours after he commenced this escapade. He decided, being a very astute person and knowing all about medicine, that as he had chest pain, he had better get back into the

water. So he took himself down to 50 feet, with the purpose of recompressing himself. Strangely enough, on surfacing, there was no relief.

We next hear of him at 1600, about five hours later. He was still on the beach, obviously not feeling 100%. The next phase was that the pain in his chest got worse. He also developed pain in the abdomen, in the ankles, hips and knees, numbness of the legs and lower back pain. He was however, mentally alert, so he put on his tank and went down to fifty feet again to try and recompress himself.

On surfacing again, there was still no relief, so he did as all good divers do, he went home to bed. Around midnight he was awakened with severe chest pain, tightness across the abdomen, severe weakness of both lower limbs, numbness and paraesthesia of both thighs and legs, inability to micturate and vomiting. He also had low back pain. When he was eventually seen he said that he had "felt terrible".

Around 0600 the following morning, almost 24 hours after the original dive, he went to the neighbouring island of St Vincent, where there is a hospital. He was flown from there, when they realised what the trouble was, to Trinidad, where he remained in the Public Hospital for a further four hours, until some bright spark there made the diagnosis of decompression sickness.

He was taken to the recompression chamber at 1630 and treated on US Navy Table 6a straight to 165, there for 30 minutes, come up to 60 feet and have oxygen with air breaks. The total time is five hours and nineteen minutes. Unbelievably, he got relief of all his symptoms within five minutes at 165 feet. He emptied his bladder spontaneously. The diagnosis of Type II decompression sickness with spinal cord involvement was made. He was given Decadron and examined fully. All his physical signs were normal. There was no neurological deficit. The cranial nerves were intact. There was no loss of sensation, no pulmonary symptoms, nor emphysema. At 60 feet all the physical signs were still normal, but the patient complained of feeling weak, and having low back pain and tightness across the abdomen, weakness of both thighs, pain in the hips and knees, numbness of both thighs and legs, paraesthesia and cotton wool feeling in the feet. The chest pain did not recur.

At the surface these symptoms persisted. So the following day he was treated on table five, which is the oxygen table, and all his symptoms decreased. Table five was repeated in the evening of that same day, the morning and evening of the next day, and the morning of the following day. After each treatment there was a further decrease in his symptoms. After five oxygen treatments the only symptom was tightness across the abdomen. This persisted in spite of further treatment over the next two days.

They then decided to discontinue the chamber

treatments as all possible improvement had been presumed to have taken place. He was given Decadron 10 mg daily throughout the whole of that period. The patient was comfortable and happy and was returned to Biquea one week after the accident.

The tightness across the abdomen could possibly have been muscular pain from trauma during the dive, or to use his own words, "Because I had to get to the boat in a hurry", after the fish attacked him.

This again is a case of totally successful recompression treatment using a table 6a and continued with intermittent use of table 5, of a patient who violated almost every rule of diving and paid the penalty for it, developing decompression sickness with a spinal involvement. He was not treated for some 31 hours after the original symptoms, and probably some 23 hours after the offending episode. If a diver is lucky, treatment can be delayed up to 33 hours and still achieve a good result, but I would not really recommend it.

CASE THREE

The next case is one of my own. It has not been presented before although I had prepared it for presentation when I left the Bahamas to return to Australia. As a result of the move all my notes are inaccessible. This case is very clear in my head, due to the principles involved, although the exact details as to times, specific depths, and specific treatment are not at my fingertips. I think it is the overall picture which is important.

The story concerns two experienced divers, A and B, who with diver C looking after the boat, went for a dive in the Bahamas to a ledge at roughly 120 feet. The dive must have pushed the limits of the table, although they were not at 120 feet all the time, but remember that according to the tables one has to take the deepest depth. They were on the borderline of having a decompression dive.

While they were down at depth, diver B noticed that diver A was in difficulties. When he swam over to him, he saw that A was unconscious with his regulator out of his mouth. Diver B then took diver A to the surface. B was an experienced diver, a diving instructor who ran a dive shop, so he knew what to do. He tried to give his buddy buddy-breathing on the way up, but the buddy was unconscious and was unable to keep a regulator in his mouth. Diver B was very certain that diver A made not one attempt to respire, in other words, he held his breath during the ascent.

They arrived at the boat. The unconscious diver was pulled into the boat, and they thumped him and bumped him and did the right things. He gave a huge gasp and retched and vomited a great quantity of sea water. In a reasonably short space of time he was breathing. It was about a half hour boat trip back and

by the time they reached the shore, diver A was fully conscious and a little bit upset that people were making a fuss about him. However, his buddies were reasonably responsible people and they decided that they were going to take him to the hospital anyway. They took him to the hospital where he was admitted and put to bed and treated as a case of near-drowning, partial drowning, incipient drowning, or whatever one likes to call it.

His two buddies, the one who had helped him to the surface and the one who had been in the boat, then decided to walk down the street and have a hamburger and a beer. On the way, diver B, who had brought diver A up, noticed that one of his legs was not working properly and thought that he must have bumped it getting into the boat. So he had his hamburger, then got into a taxi and went back to the boat on which they were living. By this time he realised that one of his legs was not in good shape. So he did the usual thing. He went to bed. This all had happened in the late hours of the afternoon. By the time he decided that something was wrong, and that he needed treatment it was late. Around 2330 diver B presented himself at the chamber.

When I was informed my immediate concern was the fellow in hospital, who was probably sitting up in bed with an air embolism, or at least pulmonary barotrauma. Although he was reported to be normal, I felt that he could not have come up from 120 feet without breathing and not have something the matter with him. So I told them to stick diver B in the chamber on a table 6a. And I went to see the fellow in hospital.

I found diver A sitting up in bed smoking a cigarette and asking when he could go home. I had a look at his chest X-ray and found it completely normal, so I tore back to the chamber to see diver B. By that time my colleague had arrived, so I went into the chamber and he stayed on the outside.

To cut a long story short, we did serial treatments, and there was an improvement over three or four days, but nothing dramatic. He also had Decadron and various ancillary modes of treatment, but he was not benefiting remarkably from any of our treatments and eventually he was sent off to the States where he had an intensive course of physiotherapy. The last I heard of him, he was back to operating his dive shop, back to diving, feeling pretty well, but with some neurological deficit in his leg.

Two questions that arise from this are:

1. Why did diver A, the unconscious one, not embolise, coming up from 120 feet without breathing?
2. Why did diver A, even if he did not embolise, not get bent when his buddy did?

It has been suggested that diver A breathed out before he was found unconscious at 120 feet. It is possible than if he just had residual air, that his lungs would not have inflated to the point of bursting by the time he reached the surface. While that is possible, I prefer another explanation, liquid breathing!

I mentioned that when diver A was back in the boat he vomited copious amounts of sea water. I suggest that for some reason or another, he had a malfunction of his equipment and inhaled sea water. As a result he had two lungs full of sea water, which of course would prevent an air embolism. So here is a new way to prevent someone having an air embolism, drown him first!

Why did diver A not get bent? Perhaps it was because he did not exercise on the way up or in the boat. I think it more likely that some people bend and some people do not for the same exposure. I think that diver B's decompression sickness was just a manifestation of chance.

DIVING ACCIDENTS IN NORTHLAND, NEW ZEALAND

Edgar Johnson

I am a pathologist, so you can imagine the outcome of the cases which I will be talking to you about. However, I do not intend to just discuss a list of tragic misadventures. The reason for giving this paper is to point out one cause of underwater tragedy, and subsequently I would hope to learn the opinion of others.

The northern area of New Zealand is served by two pathologists who come to see all the violent or unnatural deaths. It is about 100 miles to Whangarei, from Auckland, where the Poor Knights islands are offshore, and about 40 miles further on there are the Three Kings islands. There is a population of about 100,000 in this area, jumping in summer to approximately 200,000. Probably the greater part of recreational diving in New Zealand takes place in this Northland area, the reasons being the climate, the clarity of the water and the special attractions.

In 1902 on a calm but foggy day, a cargo-passenger ship was travelling at full speed when it ran slap into a charted rock and sank. The bullion lost ran into millions. Soon after the tragedy, two divers, in an attempt at salvaging on the wreck in 150 feet of water, soon succumbed to a mysterious illness, characterised by muscle and chest pain, subsequently known as the bends, or now as decompression sickness. More recently, about fifteen years ago, Kerry Tarleton began a huge salvage operation which today provides the fortunate diver with the possibility of finding a gold or silver coin in the sand.

Between 1976, when I arrived in Northland, and mid 1982, there were eleven scuba related diving deaths. During this seven year period the national toll was thirty one. But in Northland all these accidents have come through the one centre at Whangarei, I was involved in most, but not all, of the post mortem examinations.

CASE ONE

The first was a young diver who went alone into the water from the beach, from a group of divers. He was found on the bottom in about ten feet of water, with all his diving gear in place. There were no signs of life when he was returned to the beach. At post mortem, his head and neck were blue, and there was filling of his trachea and bronchial tree with the fragments of a very recently ingested meal.

CASE TWO

The next case, in 1977, was due to air embolism, which is the common cause of tragedies of this kind. He was diving from a boat, he surfaced, apparently normally, and waved to his companion in the boat but shortly became very distressed. By the time the companion in the boat reached him he was unconscious and died before being taken to the beach in the boat.

CASE THREE

This man was one of twelve divers on a trip to the Poor Knights Islands in 1977. Following a dive he was noticed to be trembling and a little scared. He was advised by more experienced divers on the boat not to dive if he was anxious. He went over the side ahead of two of the divers. The leader of the party saw bubbles coming up in an area where the water was up to 230 feet deep. The leader immediately donned his gear and dived, but could not find the victim. He was subsequently found about one or two hours later at 220 feet, where he was obviously deceased. When his diving bag was examined by the police, a plastic bag of cannabis was found. Subsequently the blood level of the active ingredients was found to be close to intoxication level. Subsequent examination of lung section, however, brought the conclusion that this man may have inhaled gastric contents whilst diving.

CASE FOUR

Three companions, having completed a dive for scallops, were swimming back to their boat when the first two looked round and found their companion was no longer swimming with them. Just before the disappearance, one of the swimmers thought that their companion was swimming somewhat erratically. He was later discovered, unconscious, but died of drowning.