

Dr John Hayman

Nothing. When I open the skull and then remove the brain, I then go on to look at the middle ear. The incision we use goes up around the side and exposes the mastoid on the way up. There is also the question of examining the spinal cord and examining the hips, knee and shoulder joints, which are the usual sites for articular bends. My feeling is that if I am dealing with a professional diver who may well have these changes then I should go ahead and so that full post-mortem. In a professional diver and certainly one of the abalone divers I would want to get as much tissue as possible and not necessarily to look at myself but to pass on to somebody else who would be interested in it.

Dr Carl Edmonds

I would like to go on record as saying that I have slung off at pathologists for the last 15 years and I now withdraw those comments.

Dr John Hayman

I think that your slinging off at me at least would be firmly justified 15 years ago when I first went to Sale. I think I have only just acquired this experience. I would like to think that I am now much better at doing post-mortems on divers than I was 15 years ago.

ABALONE DIVING IN NSW, INCLUDING A CASE REPORT

John McKee

My first interest in abalone divers occurred some twenty-five years ago, after I had spearfished for some years, then undertaken a Scuba course, and then observed the activities, from a medical point of view, of New South Wales Far South Coast abalone divers.

In those days, it was a rather frightening observation in many ways, because of their rather extraordinary dive profiles and diving habits, which if adopted by we amateur divers would almost certainly have led to our demise.

In 1962 the first diving and medical text book; written by Stanley Miles, became available in Australia, and during my four or five years overseas I studied that book, and on my return I found that things really had not changed very much in regard to the way abalone divers behaved in the water in New South Wales.

In the early 1970s, as some of you may be aware, abalone reached a very high price, and it produced a very good income for many professional divers, varying between \$500 and \$1000 per week. At that time, some 10 to 15 years ago, I found that school leavers were taking up abalone diving, as a means of obtaining an income, and many of them had no training, and some tended to drink excessively at night before diving, and also take drugs. Unfortunately, in my area, when the abalone were fished out or they went too deep, some of these young men would then have a one week course in using a chainsaw, and they would then become tree fellers, and regrettably some of them came back to me

as surgical patients!

In recent years regulations have come into the abalone diving industry, and in New South Wales there are now some 60 professional divers, of which 20 are on the North Coast. Those 20 tend to dive in shallow and surge conditions, whereas the 40 in my region, between Narooma and the Victorian border, dive much deeper, anywhere between 1 metre and 40 metres, although the average would be between 13 and 25 metres.

In southern New South Wales the average abalone diver, weather permitting, does three dives per day, each to around 22 to 25 metres. These usually last for one hour, following each descent, and then the diver brings up his abalone bag. After a brief rest, he then goes down again. He basically does three deep dives, of approximately one hour each, of 20 to 25 metres, and then the final, usually fourth dive, the so-called "shallow dive", tends to be between 8-10 metres. It is that latter dive, which for some unknown reason, seems to prevent the abalone diver from developing one of the most serious complications of diving, decompression sickness.

Abalone diving may be hard work, and in fact it is estimated that a diver who is working at about 20 metres, in reasonably heavy conditions, perhaps in one hour does as much physical work, as does a labourer doing manual work at atmospheric pressure, on the land for seven hours. The abalone diver in our area may be wearing a 20-30 lb weight belt, he may be dragging behind him an abalone bag of varying size and weight, he will have a hookah connection to the surface supply air, of between 75 to 100 metres length, and this often has to be dragged through a current of 2 to 3 knots.

Abalone divers suffer from numerous medical conditions, diving related, similar to those which may afflict amateur divers. One of the most troublesome ones is the so-called ear drum "scarring" or perforation, related to changes in pressure. The abalone diver makes frequent ascents through the water, often from great depths, bringing back bags of abalone, and as he is constantly in the water over many hours, he probably has inflamed and rather water-logged ears. Every now and again he is subjected to an emergency free ascent, when his hose gets cut by a propeller, or the hose bursts.

Another complication of abalone diving is decompression sickness, but we have been rather fortunate in our area. Over the last eight years there have been about 15 cases of decompression sickness, of which several have been severe. All of those in recent years have survived, but until about 1975 there were a number of deaths on both sides of the Victorian border.

From a subjective point of view, abalone divers consider that they acquire a partial deafness defect, due to prolonged ear drum exposure in water and it is probably reasonable to say that in our area some 80% of the divers are afflicted in this way. Probably all veteran divers have some permanent form of ear problem, as a result of their diving. From the subjective point of view, I am told by friends of mine who are abalone divers, that as time passes, they notice that the screeching of the kids and cats is no longer an annoyance as it used to be. From the objective point of view of their families however, when Dad comes home from a tiring day at diving, he comes into relax and turns on the hi-fi or the TV, adjusts the volume, and then the whole family, including the cat, leave the room!

A further problem is dysbaric osteonecrosis, bone infarction from exposure to pressure, and this condition does

frighten abalone divers, from the

long range point of view. They are concerned as to whether or not their repetitive dives over the years will produce a defect in or around a joint.

The abalone divers on the Far South Coast of New South Wales are far more educated than they were in the past, and they are far more sensible. Most of them are aged between 30 and 45, they have wives and children, and they take a much greater interest in their own welfare, and in the welfare of their fellow divers.

I have had one diver recently, who went through quite a lot of stress, because he had been involved in the re-organisation of the abalone industry in New South Wales, and he had been subjected to perhaps unfair harassment, verbally and in other ways. He was diagnosed as having a stress problem, he was treated with lithium, and later he displayed quite a lot of intermittent aggressive behaviour, 'smashing up dishes and throwing furniture around, and finally crashing cars and wrecking boats. There was some doubt as to whether or not this behaviour was related to the lithium. I am interested to know whether lithium is a safe drug for divers.

DISCUSSION

Dr Carl Edmonds

Lithium has been used at depths of 1500 ft, without showing any serious effects. I would not worry about the effects of that drug under pressure at all. However, one would question whether or not lithium was the appropriate treatment for the particular medical condition afflicting that diver.

The business of divers smashing things up is very common, especially after a dive. In fact, in some other areas, such as Port Lincoln, where abalone divers are more wealthy, and as wealthy people tend to look after their property, there is one diver there who has an old car, which he goes and smashes up whenever he feels aggressive! Aggression is something that has been commonly recorded in abalone divers.

Dr Janine Mannerheim

I have a patient who has been diving for twenty years. He has been taking lithium for about six years, and he dives 200 to 300 times a year, averaging between 24 and 39 metres, and it does not seem to have made any difference to his behaviour.

Dr Peter McCartney

You mentioned that the abalone divers in your part of the world tend to collect their catch, and ascend after a long session. I have often raised this with the Tasmanian abalone divers, and to my knowledge, only two of them do that. They have developed a little rig, with snap hooks, and this allows the catch to ascend on the hookah line, although this is not an ideal thing to do. The common practice is for these divers to ascend and descend, with fairly small loads. I think this is a very dangerous practice. I have been trying unsuccessfully to get them to convert to only making a minimum number of excursions to the surface.

Dr John McKee

In our area I think there are possibly more ascents and descents, than there used to be, perhaps five years ago.

Since then abalone are being bought on the shell, so there is no need for a sheller always to be aboard the boat. The sheller was often very useful if there were changes in the weather, or the Fisheries Inspector arrived, etc., etc. Since the sheller has been done away with on many of the local bats, this is a major reason for more ascents than in the past.

Dr Peter McCartney

Our divers are specifically prohibited from shelling on the boats, and that is an official Fisheries Inspector's ruling, to 'which they seem to adhere.

THE PUNCHDRUNK DIVER

Carl Edmonds

Unlike my other lectures, I have found this presentation to be particularly difficult. I am going to try and give an overview of this history of the problem, and a statement regarding our current position.

Some years ago, a group of divers asked me if there was any truth in the common belief of "divers' dumbness". Because I was not aware of any such problem, and because I had previously demonstrated that intelligence is positively correlated with success in diving courses, I had no compunction about reassuring them.

Unfortunately, the problem did not go away. More references to the "punchdrunk diver" and to the "tunnel-brain caisson worker" made me question again the possibility of brain damage associated with excessive diving exposure. Indeed, I began to believe that the reassurances I had given may only have served to conceal my ignorance.

About the same time, a group of navy wives contacted the Royal Navy Physiological Laboratory, complaining that their husbands had appeared to suffer from a variety of disorders associated with their saturation diving. Of the seven husbands (divers) concerned, six appeared to have an atypical or sensitive response to alcohol, five showed aggressive behaviour and short temper, four had an inability to concentrate, tiredness, short memory, visual problems and a disinterest in appearance. Three were said to be secretive, slow and anxious, two had an inability to communicate, and one had become antisocial.

This type of anecdotal information is very difficult to evaluate. Certainly, the same type of things had been said amongst the wives of our own professional abalone divers, many of them stating that the husbands were very irritable, aggressive, non-communicative and inconsiderate following their diving day. The director of one of our major abalone co-operatives has stated that he would not consider contacting the diver after his day's work, even to transmit good news. "Phone him up that day, and you get into a fight, phone him up the next day and he is very reasonable".

Literature

It is not difficult to summarise the literature on this subject. There is not much of any great note. In one series of papers, it appeared as if divers who suffer severe neurological decompression sickness are likely to become effected to some degree.

Rozsahegi, in 1959, from the Hungarian Institute of Industrial Medicine, examined 100 subjects between two and a