

3. CASE REPORT - ORBITAL BAROTRAUMA

Presenting Symptoms

A New Zealand diver descended to a depth of 20 feet, using a compressed air demand supply. At this depth he noted that his right eye was becoming swollen. He requested permission to ascend and this was given. By the time he reached the surface the right eye was completely closed, and was grossly swollen. Duration of illness - 3 hours prior to presentation.

Past History

This diver had received a 'black eye' during a minor altercation some days previously. He decided to dive with this, assuming that it could not in any way influence his performance in the water.

Clinical Features

The right palpebral fissure was completely occluded by the puffed up and slightly bruised eyelids. It was impossible to open these due to the swelling, and thus the cornea could not be observed. Palpation of the superficial tissues of the orbit revealed a surgical emphysema. There was no evidence of any pathology of the ears, nose or throat.

Treatment

The books on diving medicine didn't help very much for this one. We decided to administer 100% oxygen via a mask and bag, with a high O₂ flow (15 L/min). Within an hour the swelling had decreased greatly in size, the eye was able to be opened by the patient and there was no evidence of any ocular pathology involving the cornea or sclera. The patient himself stated that discolouration was no worse than when he had commenced his dive. O₂ was then administered for a further hour, with again further improvement in his clinical state, as shown by a further decrease in the swelling and a widening of the palpebral fissure. No diving for 2 weeks.

Follow Up Treatment

The patient was observed for a couple of hours and then dispatched back to his ship. He was advised that under no circumstances should he do any flying, and that if a recurrence of the swelling is noted, that he immediately start breathing 100% oxygen, as previously described.

Provisional Diagnosis

Facial barotrauma, involving the orbital tissues, with the probably source of entry of air through the integument damage ('black

eye'). It is presumed that during the dive there were some periods in which the pressure within the face mask exceeded ambient pressure by a slight degree, but sufficient to cause a passage of gas into tissues. The ascent produced an aggravation of the condition, in accordance with Boyle's Law.

Comments

1. There seems to be no limit to the variety of barotrauma.
2. Diving should not occur following any injury which produces a break in the integument. This is specially applicable where the integument is related to higher than ambient pressures, eg. following dental extractions and breathing with a positive pressure demand system.
3. 100% O₂, given through an efficient mask and without positive pressure, is invaluable for the removal of bubbles within tissues.
4. Recompression therapy is not required in barotrauma producing surgical emphysema, no matter where it may be, as long as there is no likelihood of mortality or serious morbidity.