Sphenoid Sinus-Related Vision Loss and Scuba Diving: A Case Report

Jochen D Schipke1*, Sinclair Cleveland2, and Markus Drees3

1Research Group Experimental Surgery, University Hospital Düsseldorf, Germany
2Institute of Neuro- and Sensory Physiology, Heinrich Heine Universität Düsseldorf, Germany
3Medical Office for Otorhinolaryngology and Diving Medicine, Germany

Abstract

Sphenoid barotrauma and vision loss after scuba diving is a rare condition. We report on the 17-year-old Luc Besson, his case being described in a biography, published in French in early 2016. In spite of suffering from sinusitis, he performed an open-water solo scuba dive to 35 m. Soon after the descent, he suffered from ‘sinusoidal’ pain. Thus, he surfaced to 20 m where he became blind. He then descended some meters and regained vision. Ascending to 20–15 m, ‘each time’ he lost vision. Finally, he reached the surface in an ‘indescribable’ condition. Besson was transferred from Italy to a Marseille hospital, where he stayed for two weeks. The biography mentions nothing about either diagnostics or therapy, but vision loss must have resolved spontaneously. Missing diagnostic data from the hospital present a major shortcoming of this case report on a 30 years earlier accident. It is known, however, that the treating physicians specifically prohibited further diving. Thus, the presence of anatomical variations e.g. Onodi air cells must be speculated. The authors recommend that both divers and physicians consider that parallel to usual causes of diving-related headache, otic and paranasal sinus barotrauma need more consideration.

CASE PRESENTATION

Sphenoid barotrauma after scuba diving is rare [1] is rare. Similarly, sphenoid sinusitis-induced vision loss is also rare [2]. Sphenoid barotrauma with vision loss occurs even less frequently. This might be due in part to the fact that it sometimes resolves spontaneously, as described here for Luc [3]. After intensively searching the literature, there were only four cases related to scuba diving and two related to breath-hold diving.

During dive descent

Within his brief notes on 16 dive accidents, Nemiroff (1977) [4] presents one case of a 32-year-old man performing an underwater exercise [4].

A male scuba diver had no problems with equalizing. At a depth of 22 m his right eye faded out. Further descending to 26 m, both eyes were blinded. After ascending to about 7–8 m, vision gradually returned and was normal at the surface [5].

During dive ascent

After four recreational scuba dives a female diver developed a progressive neuropathy of the right eye while ascending. A CT showed fluid in the right sphenoid sinus. Partial vision loss resolved over 10 days [6].

After scuba diving

In an experienced female diver a left side monocular blindness developed after scuba diving [7]. Sphenoid barotrauma without vision loss was diagnosed in two breath-hold divers who both complained of acute headache during descent to 12 and 13 m, respectively [8].

MECHANISM

A barotrauma might develop in paranasal sinuses with malfunctional or dysfunctional ostia during changes of the ambient pressure, i.e. during descent or during ascent. Here, Besson experienced pain soon after he had arrived at the bottom. Thus, due to dysfunctional ostia, the pressure equalization was hampered. As a result pressure in the sphenoid sinus must have been lower than the ambient pressure. During the following ascent, the air in the sinus expanded but could not readily exit the sinus thus producing a higher than the ambient pressure. It is described that blindness can result not only from elevated...
pressure on the optic nerve but also from pressure on the internal carotid artery [8].

**CONCLUSION**

Because of the deleterious consequences, divers and physicians must be very vigilant so that this type of injury remains neither undiagnosed nor misdiagnosed.

**REFERENCES**