

DELAYED HBOT FOR DYSBARIC SYMPTOMS IN RECREATIONAL DIVERS

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Introduction

Fife cases of dysbaric symptoms are reviewed, in which recompression treatment was omitted or delayed for 12 days or longer after the onset of dysbaric symptoms

One patient had pain only (type I)

The other three patients had paresthesia, nausea/vomiting (type II)

One patient had barotrauma of the inner ear

Materials & Methods

All patients were the recreational divers

One patient received HBOT (abbreviated table 5 US NAVY) and then continued 10 treatment at 2.0 ATA for 60 minutes till symptoms disappearance

Three patients received 6-10 HBOT sessions at 2.0 ATA 60 min. each

One patient received normobaric oxygen (1 hour per day) during 1 month

First case: J A C R. Male aged 56

History of seminoma and successful surgery in 2001

Was diving at 3.40 meters not exceeding a NDL (no decompression limit)

After 48 hours after surfacing appeared pain localized in the right elbow, with relief in certain position

Consulted 3 weeks after diving for a joint pain

Diagnosis: sequelae of DCS type I (mild) with pain in the joint (bends) or arthrosis (!)

Treatment

The clinical picture was interpreted as the inflammation manifestations

After first HBOT at 2.0 ATA for 60 minutes, the pain disappeared. Bone scan and MRI were asked, but never realized

The patient receives 4 HBOT sessions more, considering chronicity and inflammation nature of the symptom with complete recovery

Second case: A.L. male aged 35

Moderately obese, humerus fracture 16 years ago treated by osteosynthesis, open-angle glaucoma

Diving experience - 1 year

Diving in cold water at 21 m and ascending without decompression stops because of technical problem in his air tank

2 hours post surfacing suffered thoracic pain, pain and paresthesia in both upper limbs

Haemogram, R-x of thorax and wrists showed no pathologic findings

In 2 weeks hyperesthesia in the right foot, tingling. Nocturnal paresthesia, diurnal discomfort

In 3 weeks bilateral cramps in lower limbs, nocturnal paresthesia in upper limbs

A slight reduction of the nerve conduction velocity (median nerve)

Consulted in 4 months after diving

Diagnosis: sequelae of DCS type II

Treatment:

The first HBOT at 2.0 ATA 60 minutes produced a slight benefit Received 9 HBOT sessions more, with subjective improvement and disappearance of symptoms

Evoked potential test was asked, but not realized, hence the result is considered as partial improvement

Third case: C.P. male patient 42 yrs.

was diving in cold water in dry suite First dive at 33 m, second at 14 m, during the second floatability problems (yo-yo effect, changing the depth from 14 to 9 m)

A fast ascent because of the same problem

At surfacing vomiting, and headache.

Not asked for medical aid

Six days later headaches, nausea, vomiting, large bone pain, neck pain, weakness, fatigue

Consulted in 12 days after diving

Diagnosis: DCS type II 12 days of delay in treatment

Treatment:

The patient received abbreviated HBOT table 5 of US NAVY with marked improvement of all symptoms

Nine more HBOT sessions at 2.0 ATA of 60 minutes each

Complete recovery

Fourth case: L.C.D. male patient of 33 yrs. with 10 years of diving experience

Diving during three consecutive days in Caribbean region with all diving and decompression precautions

In 2 hours after the last dive had thoracic pain, pain in the left arm, paresthesias, the latter increased the next morning

R-x of thorax, haemogram, ECG, cardiac and hepatic enzymes (GPT 125 UI)

Because of thorax pain the patient received *Aspirin*, *Isosorbide Dinitrate*, *Ranitidine*. Continued with symptoms, anxiety and psychological distress

Because of transpiration, vomiting, weakness and anxiety received 1 HBO session at the 5th day after diving at 60 ft during 90 minutes. Complained ear pain after HBOT

The symptoms returned some days after treatment

Consulted us 14 days after diving

Diagnosis: DCS type II recurrent (after 1 HBOT), with multifocal sequelae: headache, thorax pain, skin alterations (Rash on the back, fingers and face)

Treatment:

Inflammation manifestations in areas affected by nitrogen bubbles

The patient could not access to HBOT

Normobaric oxygen daily 1 hour during 1 mo with complete recovery



Fifth case: J.M. Male patient of 59 yrs. with

1 year of diving experience

Diving at 10-12 m during 50 minutes.

Descending at 3 m realized Valsalva maneuver reaching right ear control, but not of the left ear. Appeared tinnitus in the left ear. Denies labyrinth symptoms. Rapid ascent because of tinnitus

ORL on the same day. **Diagnosis:** acute otitis media, ATB (7 days) and anti-inflammatory drugs (5 days)

After 3 weeks audiometry shows progressive loss of acoustic perception in the left ear from 500 Hz till 8000 Hz

RMI: cochlea, vestibules and semicircular conducts conserved

Treated with steroids without clinical effect

Consulted us 4 mo after the event

Differential Diagnosis with

- sudden sensory hearing loss
- decompression sickness of inner ear
- trauma of the inner ear (x Valsalva)

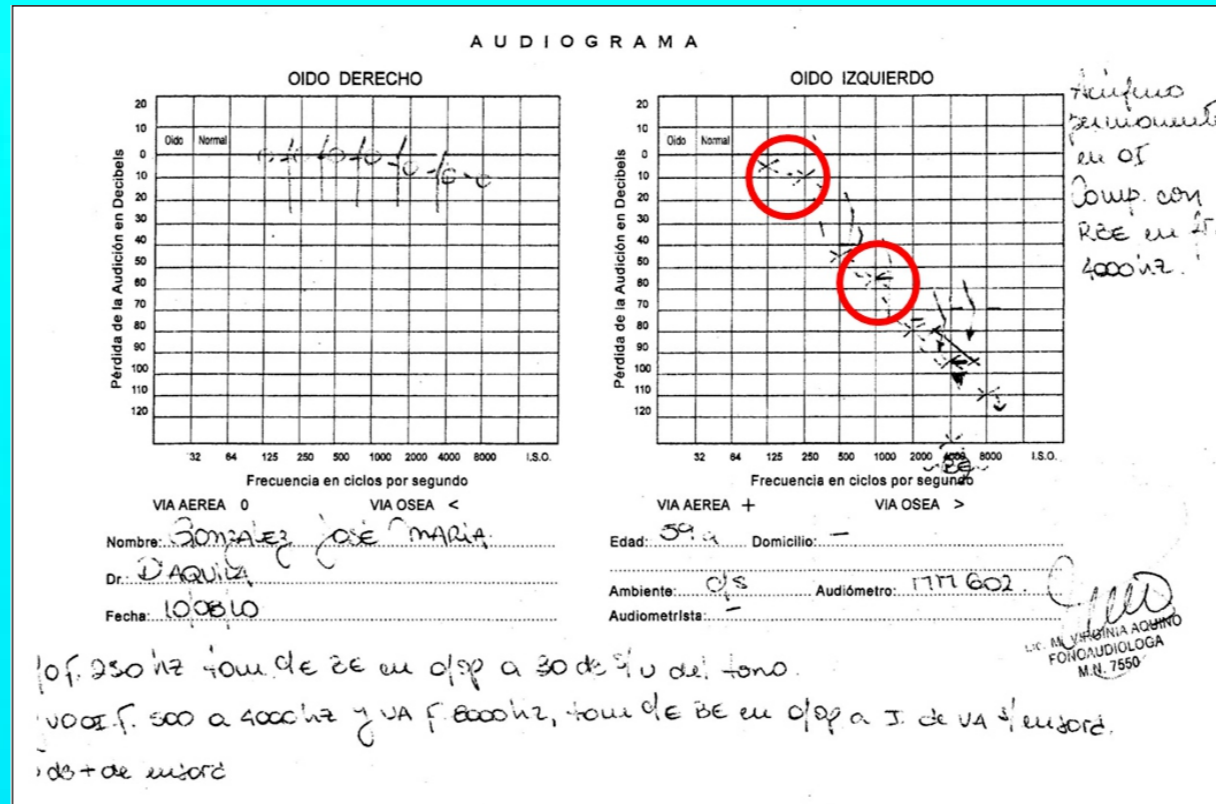
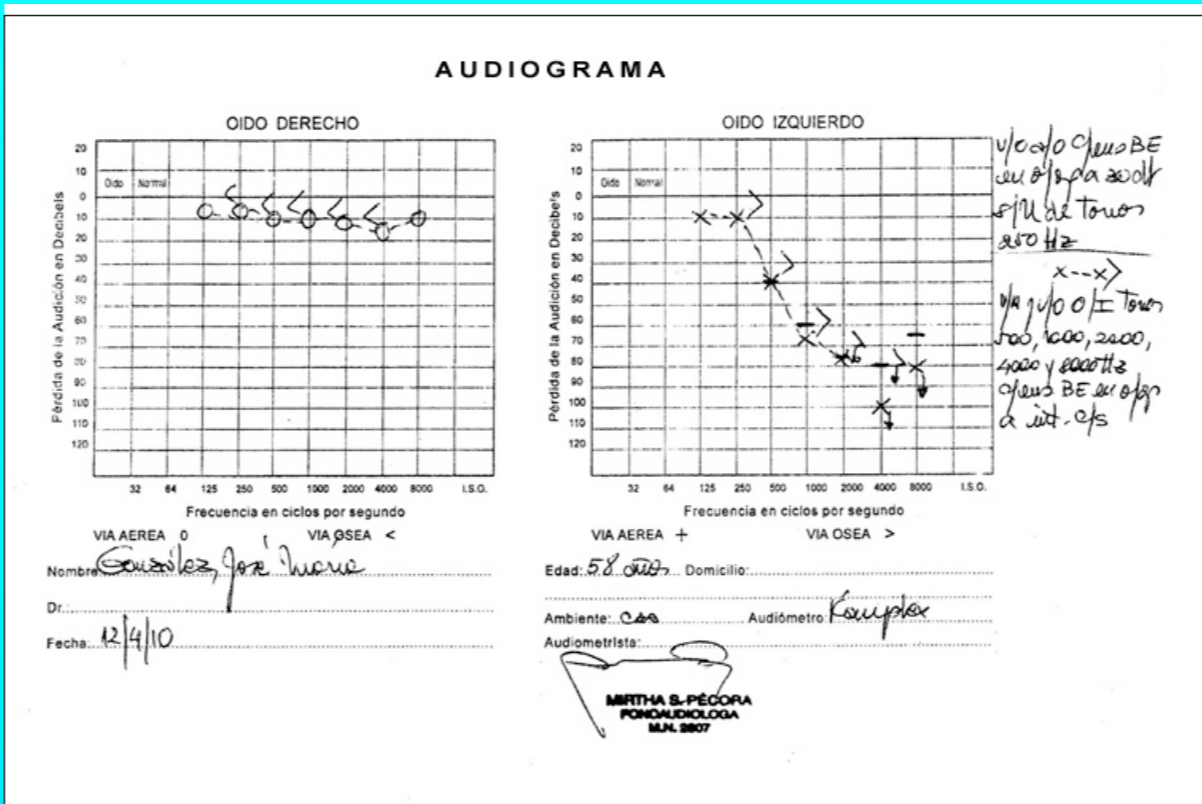
Treatment

10 sessions of HBOT at 2 ATA during 60 minutes each

No clinical effect respect hearing loss, the insignificant recovery of 5 dB at 125 Hz and 1000Hz

Disappearance of tinnitus from the 5th HBOT

After 1 mo tinnitus reappeared, slightly less annoying



Results:

Four patients recovered either completely (three: 1st, 3rd and 4th) or substantially (one: 2nd) all associated with treatment, although much delayed and in some cases not a standard recompression protocol

One patient (5th) continued without improvement

Conclusion:

Although our hyperbaric facility is located far from usual places of recreational diving, the diving pathology should be waited for and the staff should be prepared for diving pathology treatment.

Some of our patients violated the rules of decompression procedure; generally, these cases are more severe.

No breach of the rules of diving and decompression could also lead to DCS or other dysbaric problems

