

# **BREATH-HOLD DIVES INDUCE CEREBRAL INFARCTIONS**

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**BACKGROUND:** Repetitive breath-hold (BH) dives rarely induce decompression illness (DCI), and we described a few Japanese professional breath-hold divers (Ama) with DCI.

We report another Ama diver with neurological events during dives, and present the characteristics of DCI in BH diving.

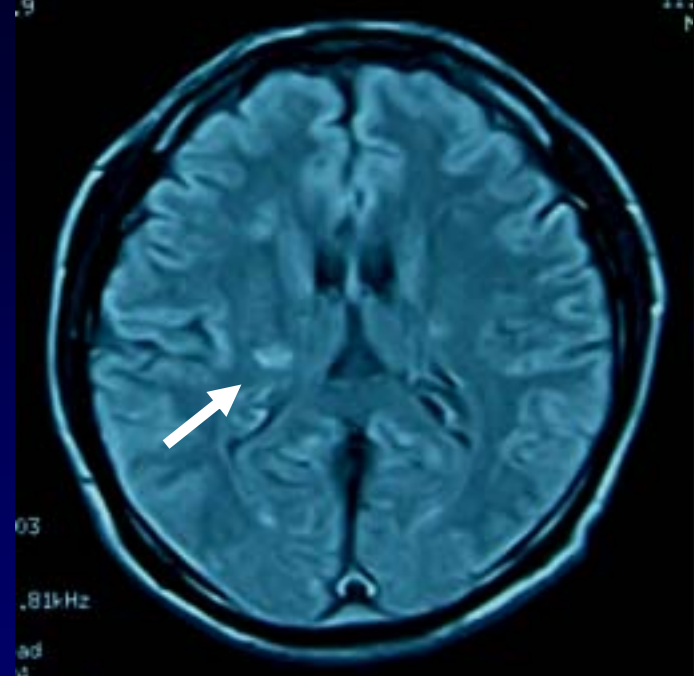
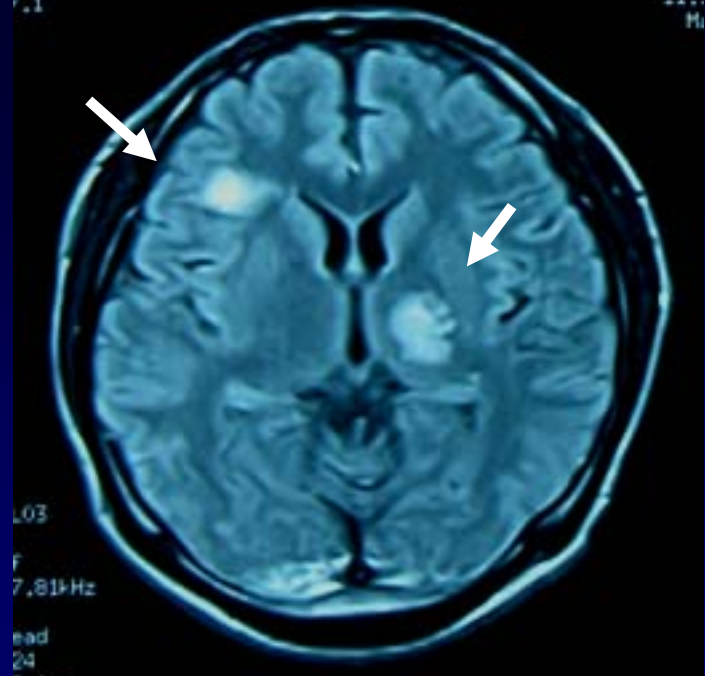
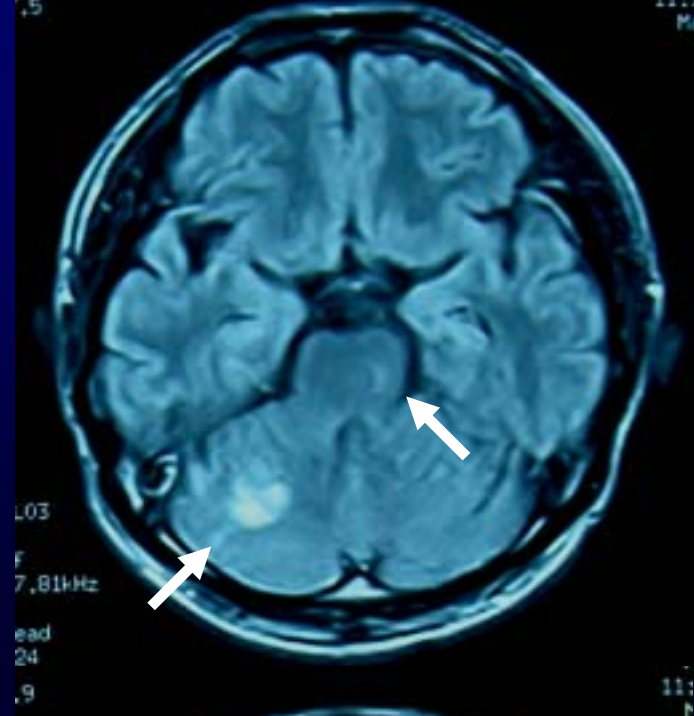
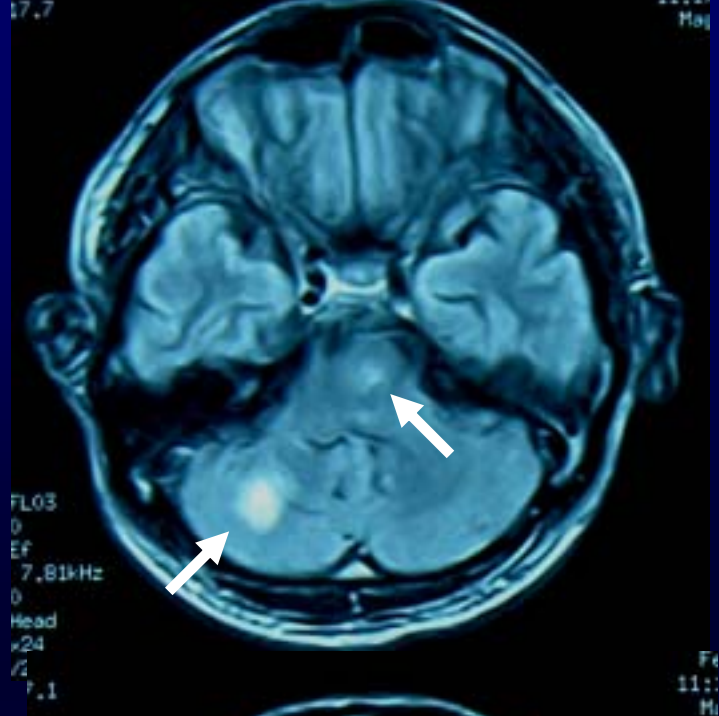
**CASE REPORT:** 34-year-old man,  
partially assisted Ama diver,  
descending to 10-25 msw using a  
22-kg weight, and ascending  
without assistance

diving time: 40~80 sec with 20~30-  
sec surfacing intervals

**After 2 hrs of diving, numbness in his right hand happened at 10:00.**

**He continued his diving work until 15:00 with a 40-min lunch break, and he noticed double vision and numbness in his right cheek and toe with nausea and dizziness.**

# MRI 2nd day



# Reported Ama divers with DCI

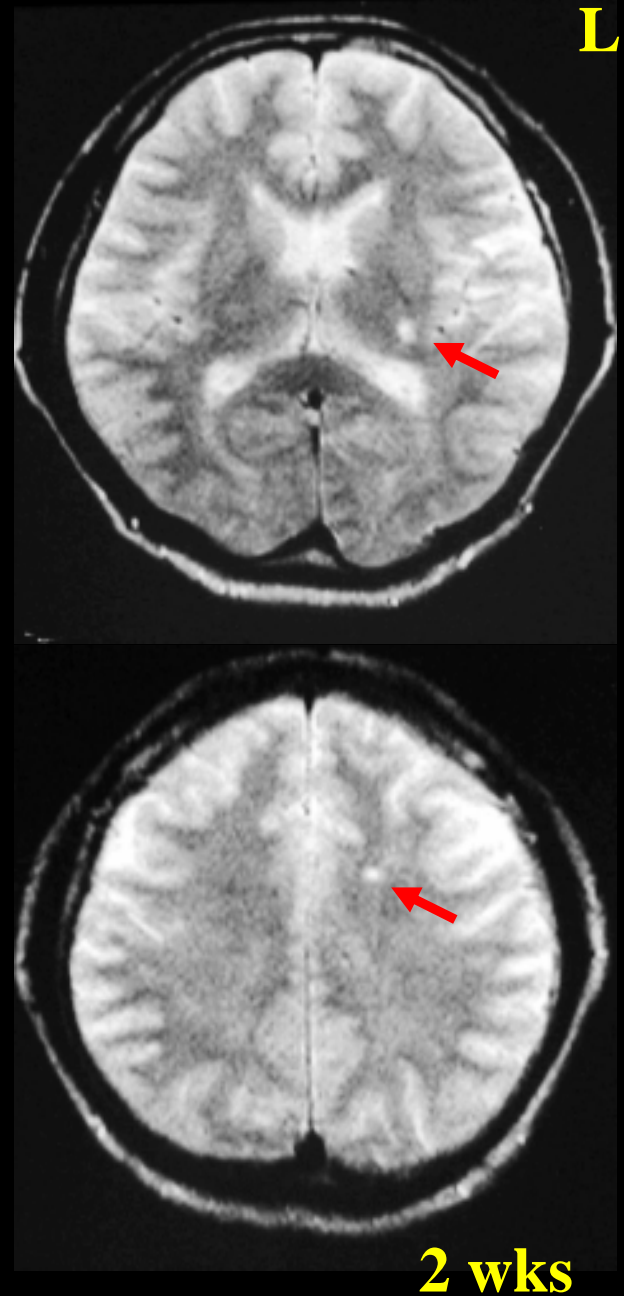


‘Ama’ means ‘Sea women or men’

**44 y, male**

After 3.5 hrs of diving,  
symptoms were  
nausea & double  
vision, speech  
difficulty, motor  
weakness and  
sensory numbness.

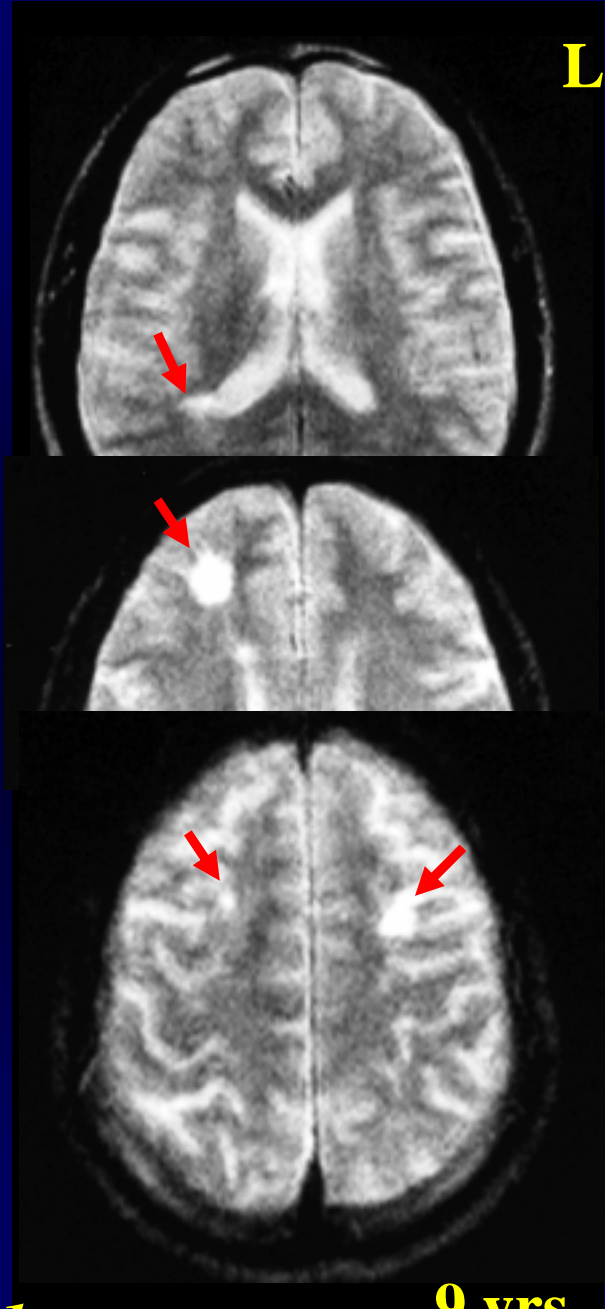
*Mt Sinai J Med '98*





**43 y, male**

At 34 yrs old,  
after ~4 hrs of  
continuous diving,  
left hemiparesis &  
sensory disturbance  
appeared and seizure  
happened.

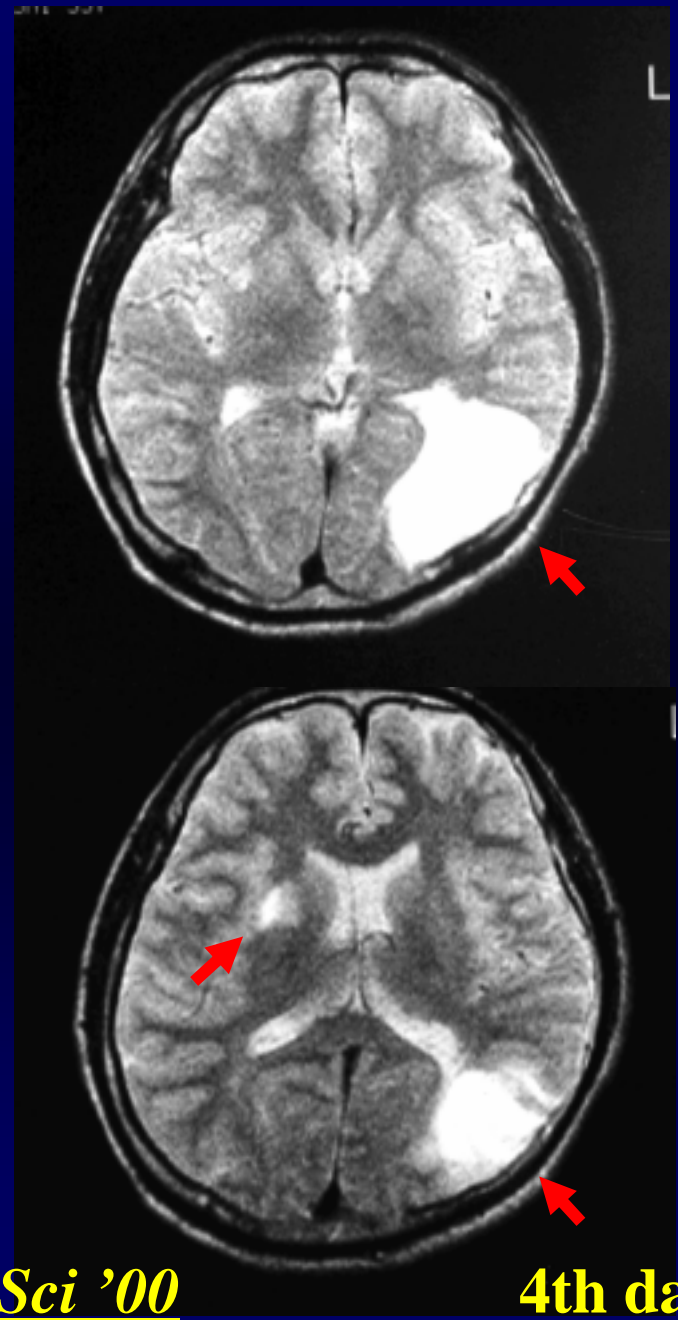




**33 y, male**

**22 msw; 1~1.5 min  
dives with 1-min  
surfacing intervals**

**Starting from 9:20  
with 20-min lunch  
break, dizziness and  
blurred vision  
appeared at 14:10.**



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**4th day**

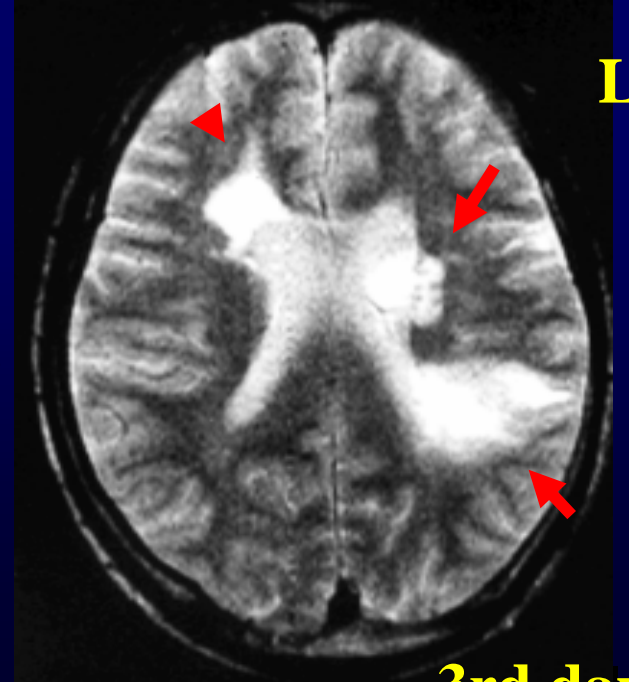
**39 y, male**

20~23 msw; 1~1.5 min  
dives with 1-min intervals

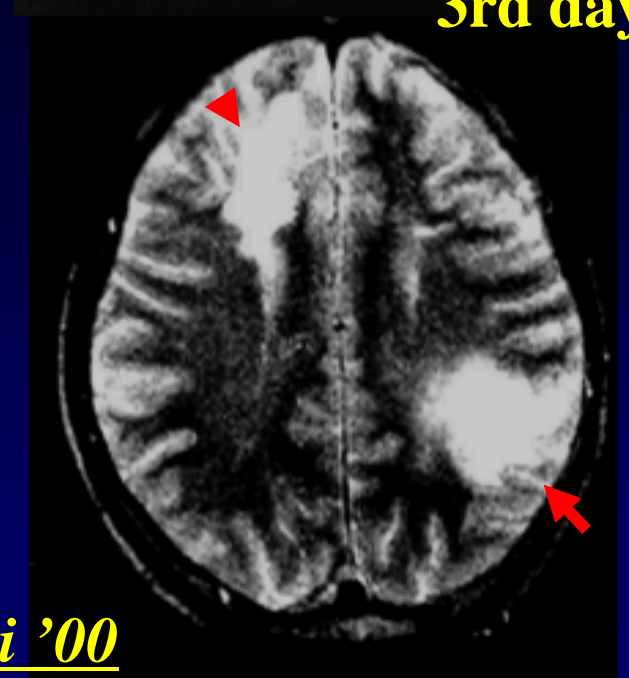
9:00~12:00; dizziness.

After 1-h lunch break,  
right motor weakness &  
sensory numbness at  
14:20.

Left hemiparesis at 17, 25  
& 27 yrs old.



3rd day



# Mechanisms of DCI in breath-hold diving

**N<sub>2</sub> accumulation  
in tissues after  
repetitive dives**

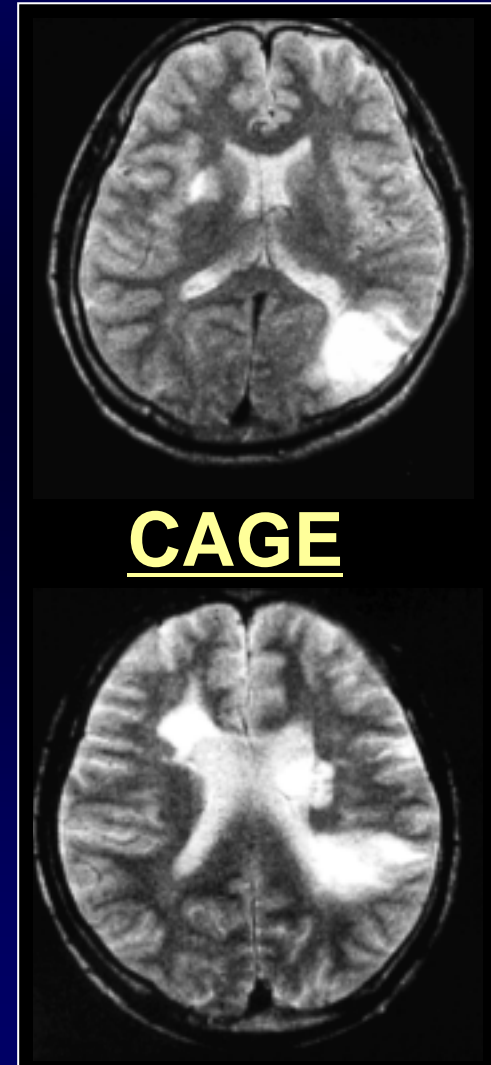
**Trapped  
bubbles  
through the lungs**

**Microbubbles  
through pulmonary  
capillaries**

**Rt-Lt shunt  
of the heart**

**De novo  
bubbles in  
arteries**

**Bubble formation  
in venous side of  
tissues**



# **Future studies**

- **Why do BH dives cause only brain injury, especially cerebral infarction?**
- **Why are DCI symptoms different between BH and compressed air divers?**
- **Brain lesions including brainstem infarct after repetitive BH dives are serious events for divers?**