

A STUDY OF GLOSSOPHARYNGEAL INHALATION

- Looking for arterial gas embolism

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Introduction

- Neurological symptoms may occur both in scuba diving and in breath-hold diving (BHD).
- Scuba: DCS or arterial gas embolism (due to lung rupture)
- BHD: ?

Literature

- DCS (no venous bubbles detected)
- Arterial gas embolism
- DCI

Hypothesis

- Neurological symptoms in BHD are caused by arterial gas embolism due to lung rupture.
- Lung rupture is caused by glossopharyngeal inhalation (GI)
- GI is used in BHD in order to increase the lung volume
=> Increased intrapulmonary pressure

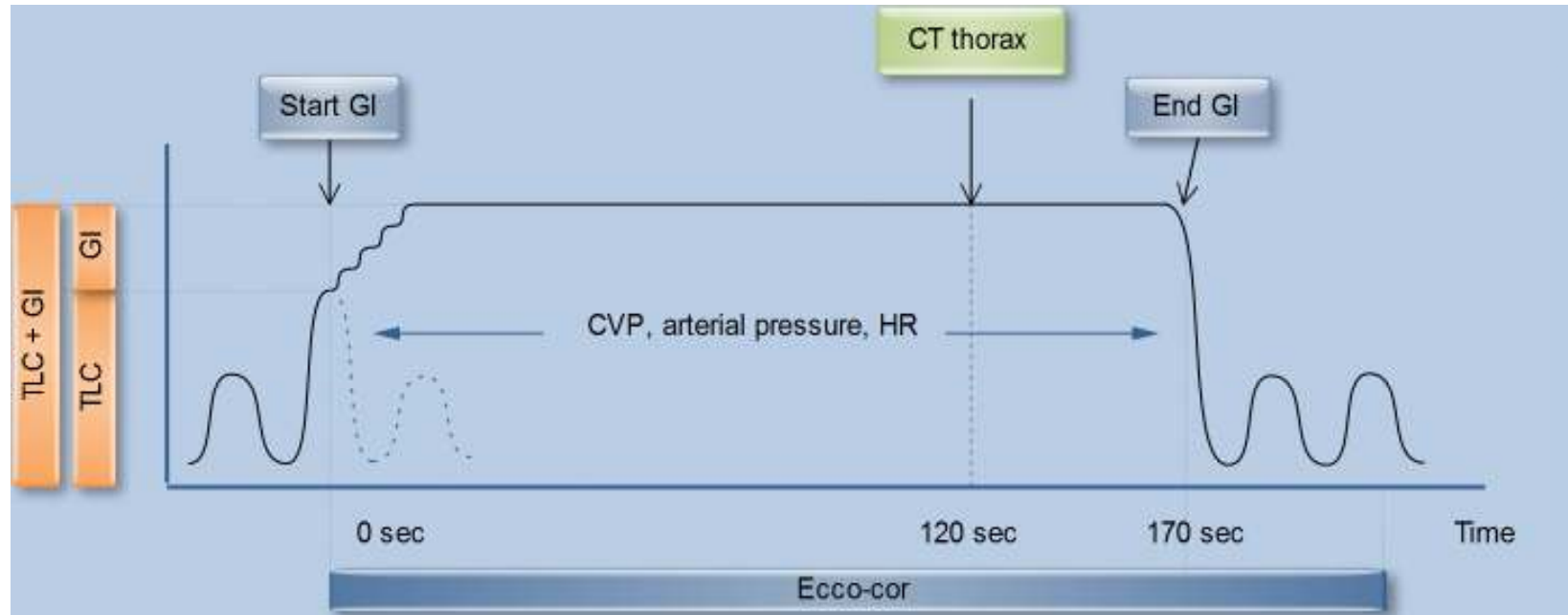
Method

- 6 breath-hold divers doing GI
 - CT-scan of the chest during GI
 - Cardiac ultrasound left atrium/ventricle
 - Central venous pressure (CVP) (inserted via the cubital vein)
 - Arterial pressure (invasively, radial artery)
 - Heart rate



Method

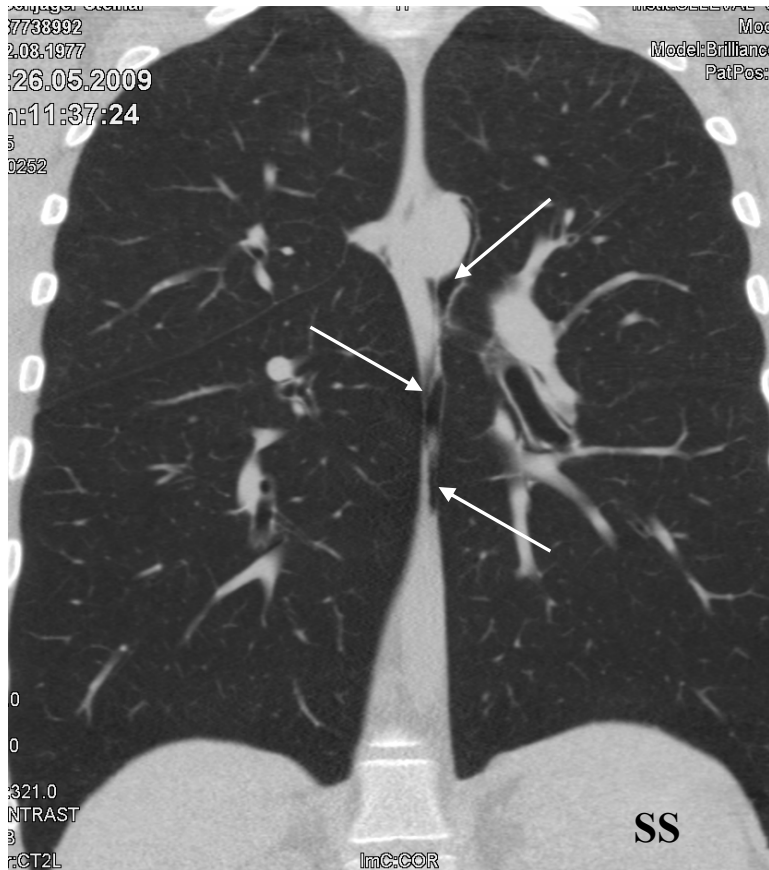
- *Illustration*



Glossopharyngeal inhalation

- GI increased the lung volumes by an average of 1,4 liters (23%).

Results

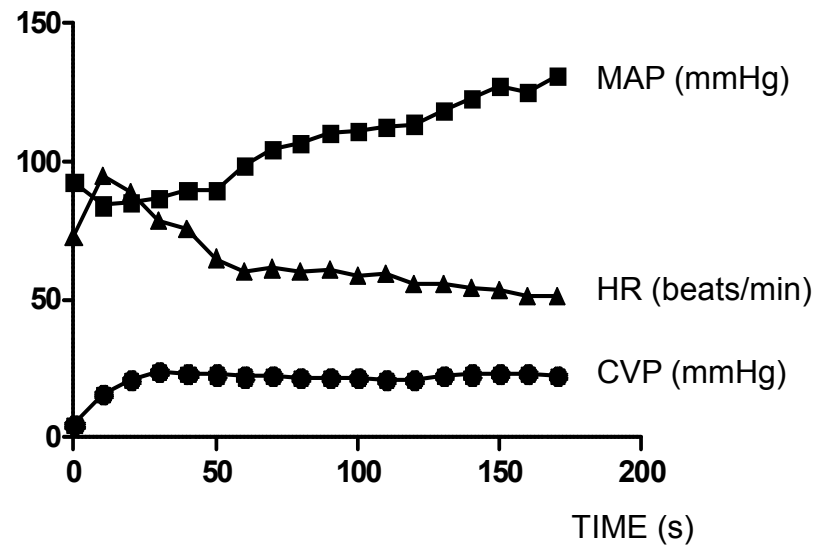


Cardiac ultrasound:
No bubbles detected

CT chest:
Pneumomediastinum due to lung rupture in 4 out of 6 breath-hold divers

Results

CVP, MAP, HR



Mean arterial pressure (MAP), the heartrate (HR) and the central venous pressure (CVP) during the glossopharyngeal inhalation.

Conclusion

- Glossopharyngeal inhalation may cause lung rupture.
- This suggests that AGE is the cause of neurological complications during breath-hold diving.
- This experimental setting did not resemble an actual dive situation.
- Increased extrathoracic pressure during diving causes the thoracic vessels to fill with blood. This may cause a situation where gas enters the bloodstream.