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Cast 30 – Decompression Illness

A 35-year-old scuba diver presents to the Emergency Department shortly after surfacing from a deep dive. He reports joint pain, dizziness, and difficulty walking.

(a) Define decompression illness and explain its pathophysiology. (3 marks)

- Decompression illness (DCI) refers to medical conditions caused by dissolved gases (primarily nitrogen) coming out of solution into bubbles during a rapid decrease in ambient pressure.
- Pathophysiology: Bubbles form in tissues or the bloodstream, causing mechanical obstruction, inflammation, and ischemia.

(b) List the common clinical manifestations of decompression illness. (4 marks)

- Joint or muscle pain (commonly the "bends").
- Neurological symptoms (dizziness, weakness, sensory changes, ataxia).
- Skin rash or marbling (cutis marmorata).
- Respiratory symptoms (chest pain, cough, or dyspnea, "the chokes").

(c) Outline the immediate management steps for this patient. (2 marks)

- Administer 100% oxygen immediately.
- Begin fluid resuscitation to address dehydration and improve microcirculation.

(d) List four (4) features on history that would support the diagnosis of decompression illness. (4 marks)

- Musculo skeletal: severe single joint pain
- Vestibular: Tinnitus, Hearing loss, dizziness, unsteady gait
- Pulmonary: Chest pain, SOB, cough
- Abdominal pain soon after ascent
- Severe Headache
- Decreased level of consciouness
- Behavioural/ mood change
- Dive characteristics- long, deep dives, rapid ascent, short surface intervals- multiple interval
- Prior episodes of DCI, air travel soon after a dive

(e) List four (4) features on examination that would support the diagnosis of decompression illness. (4 marks)

- CNS deficitis - incl cerebellar e.g. nystagmus, hearing loss, ataxia
- PNS deficitis- patchy/ multiple sites motor or sensory change
- Impaired Balance (sharpened Rombergs test)
- Hearing loss
- Nystagmus
- Normal appearing joints (no inflammation) with severe joint pain
- Skin findings such as Cyanosis or Cutis Marmorata

- Hypotension, Tachycardia/Bradycardia

(f) List 3 imaging modalities that you may perform in this patient and state associated findings? (3 marks)

- CXR – pneumothorax (CT Chest as alternative)
- CT Brain – established infarct, ICH, Cerebral Oedema, Pneumocephalus
- ECHO/Doppler US over RV/ Subclavian may show microbubbles.
- MRI Brain / Spine – features of infarction

(g) List risk factors with a higher likelihood of developing decompression illness.

- Length & depth of a dive
- Older Age
- Gender - Men:Women 2.6 : 1 - Attributed to risk taking behaviours
- Obesity
- Fatigue
- Heavy exertion
- Dehydration
- Fever
- Cold ambient temperatures after diving
- Diving at high altitude
- Flying after diving
- Tobacco & Ethanol use
- Patent Foramen Ovale (An incidence of 65%)

(h) State four (4) points in the principles of disposition for a confirmed decompression illness patient.

- Admit all recompressed patients or to advise them to remain within 60 minutes of the hyperbaric facility for 24 hours
- Flying should be delayed for at least 12 hours after diving If diving limited to 2 hours
- For multiple-day, unlimited diving, flying should be delayed for at least 24 hours
- Patients recompressed after DCS or AGE should not fly for 72 hours
- The U.S. Navy's guidelines recommend that the patient not return to diving for 7 days after recompression for type I DCS and for 4 weeks after type II DCS
- The sport diver who experiences DCS type II symptoms or AGE should probably never dive again
- Echocardiography to assess for a PFO is often recommended for divers with severe or recurrent neurologic DCS.

References

https://www.rcemlearning.co.uk/reference/decompression-illness/#1567502893761-a6cfa9a7-9830

Link above for nice discussion on Pathophysiology of Diving emergencies

https://litfl.com/decompression-sickness/

Nice LITFL summary above.

https://scghed.com/2016/01/diving-emergencies/

Summary from Charlie's ED

https://www.emdocs.net/twenty-thousand-leagues-under-the-ed-common-diving-emergencies/

EMDOCS summary that covers other types of diving injuries as well