‘Popeye the Sailor’: facial emphysema after a surface-supplied air dive

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DESCRIPTION

The patient (figure 1) is a US Navy diver who developed left orbital swelling and eyelid closure during a diving exercise. The swelling occurred immediately after surfacing from a shallow, surface-supplied helmet air dive. Two hours earlier, while performing flips off the side of the boat, he landed on the left side of his face at the water surface, experiencing mild, transient eye pain which quickly resolved. Upon recovery of his symptoms, he proceeded to dive. He made a front-step water entry and submerged to 5 feet. Facial and orbital swelling occurred immediately upon ascent, and the dive was aborted.

He was alert and oriented with no positive neurological findings. An ocular examination on the left was impossible due to its closure and lid swelling. Crepitus was appreciated in the periorbital and upper left maxillary regions without tenderness, ecchymosis or other craniofacial abnormalities.

CT imaging of the head was obtained within 12 h (figure 2). This axial image exhibited extensive left-sided orbital and facial emphysema. No fracture was seen, but the lamina papyracea contained air. It was hypothesised that a microfracture created a portal for the forced air entry into the soft tissues.

Learning points

▸ Subcutaneous emphysema may develop after diving with compressed gas.1
▸ Any gas-filled, non-compliant space in the body is at risk for air extravasation from barotraumas, obeying Boyle’s Law.1–3
▸ Diving with compressed gases may result in pulmonary overinflation syndrome (different pathophysiology than decompression sickness) with potential life-threatening complications including gas embolism, pneumothorax or mediastinal emphysema.1

Contributors

VM (PGY-3 radiology resident) assisted with obtaining the CT image with correct selection of scan to upload for publication.

Competing interests

None.

Patient consent

Obtained.

Provenance and peer review

Not commissioned; externally peer reviewed.

REFERENCES


Figure 1 Diver with profound left orbital swelling from subcutaneous emphysema.

Figure 2 Axial CT image of the brain with extensive left-sided orbital and facial emphysema.