Carbon Dioxide Embolism – A Rare Complication in Laparoscopic Surgery

Oliveira S., Bernardo S., Ribeiro L., Amorim F., Fragoso P.
Department of Anaesthesiology - Hospital de Braga, Portugal

Carbon dioxide (CO₂) embolism is a rare but potentially fatal complication during laparoscopic surgery. Due to the exponential growth of this type of surgery, the prompt identification and adequate treatment of CO₂ embolism is crucial.

CASE REPORT:

- ♀, 47 years-old
- ASA III: morbid obesity (BMI 44.2 kg/m²)
- Scheduled for laparoscopic vertical gastrectomy
- ASA standard monitorization
- General anaesthesia
  - Induction: propofol 2 mg/kg, suxamethonium 1mg/Kg and remifentanyl 0.5 mcg/kg/min
  - Maintenance: sevoflurane+O₂+air.

- Trans-thoracic echocardiogram confirmed the suspicion of CO₂ embolism.
- Surgical team confirmed left hepatic lobe perforation.
- Cerebral, thoracic, abdominal and pelvic CT scans revealed otherwise irrelevant findings except hepatomegaly.
- Extubated and admitted to the High Dependency Care Unit for 24 hours, where she remained hemodynamically stable, with full recovery of pulmonary function and no neurological alterations.
- Discharged home 6 days after.

DISCUSSION: Severe cases of CO₂ embolism described in literature occurred in laparoscopic surgery due to the erroneous placement of the Veress needle into a blood vessel or a parenchymal organ¹. In this case, the presence of hepatomegally altered Palmer's point, increasing the risk of embolism.

Carbon dioxide embolism presents with¹:

In this case, the diagnosis of CO₂ embolism was based on the rapid decrease in ETCO₂, hemodynamic instability, visualization of a perforated left hepatic lobe, and the escape of small gas bubbles through the CVC.

LEARNING POINTS: Gas embolism is a rare but potentially fatal complication during laparoscopic surgery¹. A prompt, aggressive treatment is essential once the diagnosis of CO₂ embolism is established. Anaesthesiologists and the surgical team should be aware of the signs, symptoms, risks and strategies to adopt when faced with a CO₂ embolism.

REFERENCES:

1. Park EY et al. Carbon Dioxide Embolism during Laparoscopic Surgery. Yonsei Med J 2012: 53-3.