

Incidental Detection of Venous Air Embolism during Modified Radical Neck Dissection

Sir,

Venous air embolism (VAE) is a rare but a potential fatal complication and has been historically described with sitting position craniotomies.^[1] However, it can occur in various other situations. We report a case of VAE incidentally detected during a modified radical neck dissection.

An elderly patient with carcinoma of alveolar mucosa underwent left maxillectomy with modified radical neck dissection under general anesthesia with endotracheal intubation. Anesthesia was induced with fentanyl, thiopentone, and atracurium and maintained on 40:60 oxygen-nitrous oxide mixture and isoflurane 1–2%. The proposed surgery was performed with the patient supine and head end elevated to 30° position. Intraoperatively, air bubbles were observed throughout the exposed part of the left internal jugular vein (IJV) both by the attending anesthesia team and the surgeons. However, there was neither hemodynamic instability nor any acute change in the end-tidal carbon dioxide (ETCO₂). Nitrous oxide was immediately cutoff and the surgical field was covered with wet gauze. The surgical field was carefully inspected for any exposed veins. With suggestion from vascular surgeons, using 20 G cannula, 12 mL of air and 8 mL of frothy blood was aspirated, following which the air bubbles were no more visible in IJV. The rest of the surgical and postoperative course was uneventful.

VAE into severed vessels is likely to occur when the surgical site is above the right atrium and venous pressure at incision site is below the atmospheric pressure. The true incidence of VAE during surgical procedures is difficult to ascertain as it depends on the sensitivity of the method used for its detection.^[1] Bubbles in IJV have been similarly observed in 2 of the 13 consecutive patients undergoing carotid endarterectomy^[2] and in 5 of 12 consecutive radical neck dissections.^[3] In none of these patients, there was any hemodynamic instability or a change in ETCO₂, except in one where there was a transient drop in arterial pressure and ETCO₂ suggestive of central VAE.^[3] We have never observed such an incidence in our experience before though we do carry out 40–50 radical neck dissections annually at our center. Rice and Gonzalez^[3] opine that some unexplained intraoperative events (hypotension, arrhythmia, and hypoxemia) during radical neck dissection may be due to VAE.

The volume of air required to cause VAE is difficult to ascertain. An adult lethal volume has been described as between 200 and 300 ml, or 3–5 ml/kg in few studies.^[4] In the patients prone for VAE, careful vigilance, ETCO₂, oxygen saturation, and hemodynamic monitoring have to be instituted. The management should be based on the diagnosis of VAE. Stopping air entrainment, hemodynamic

support, central venous catheter aspiration, and cardiopulmonary resuscitation have to be initiated at the earliest.

Transesophageal echocardiography (TEE) is the most sensitive device for detecting intracardiac air embolus. The major deterrents are it is expensive, requires expertise, and usually not available at institutions or operation rooms where noncardiac surgeries are being carried out. Also, noncardiac anesthesiologists are rarely trained in using TEE. We did not have the TEE available in our operation room or anybody trained in using one. In our patient, although air was noticed in IJV, the patient remained hemodynamically stable and there was no drop in end-tidal carbon dioxide on the capnography that was being employed during the case.

Although the presence of air in the IJV looks intimidating, surprisingly fatal embolisms are hardly reported owing to their benign nature.

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Conflicts of interest

There are no conflicts of interest.

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