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IMAGES IN ANESTHESIA

Massive venous air embolism

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Venous air embolism (VAE) is an under-recognized and potentially life-threatening occurrence.[1,2] Complications of VAE are primarily determined by the volume and rate of air entrainment. They may include cardiac, pulmonary, and neurologic sequelae, including death in severe cases. A 61-yr-old man presented to an outside hospital with hypotension, fever, and concern for sepsis and was transported to our facility via helicopter. During transport, he experienced chest pain, tachypnea, hypoxemia, and worsening hypotension that required administration of norepinephrine. Computed tomography (CT) revealed massive VAE present in the right heart and main pulmonary artery, with venous air seen tracking from the site of the peripheral intravenous catheter (utilized during transport) to the right heart. Cannulation of the right internal jugular vein allowed CT-guided aspiration of these sites to the peripheral intravenous catheter utilized during transport. Although transport documentation was lacking, we hypothesize that a pressure infusion bag was utilized for rapid infusion of intravenous fluids that were not properly de-aired, resulting in the VAE

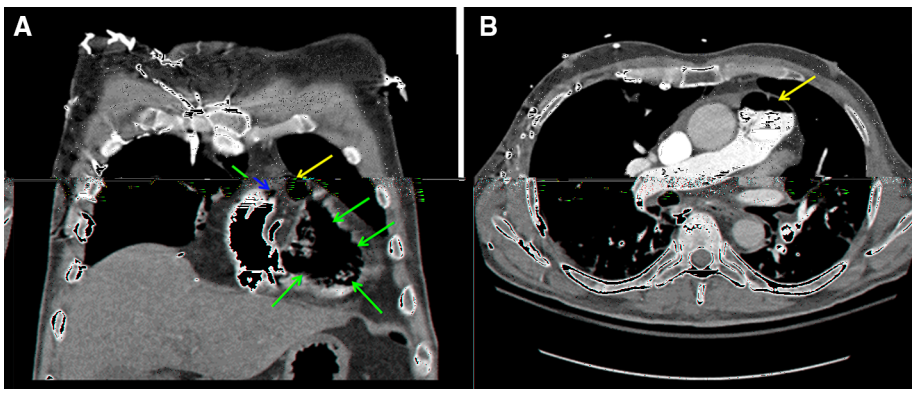

Figure Coronal (A) and axial (B) contrast-enhanced computed tomography of the chest shows a massive venous air embolism (VAE) in the right atrium (green arrow), right ventricle (red arrows), and main pulmonary artery (yellow arrows). In addition to being present in the non-dependent locations of the right heart and pulmonary artery, air was also noted to track intravenously from

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approximately 10 mL of air from the right heart and pulmonary artery, resulting in immediate resolution of symptoms.

Traditionally, operations considered at high risk for VAE are sitting craniotomies, posterior fossa/neck surgery, cardiac operations, laparoscopic procedures, and cesarean deliveries.[1,2] Although any patient with peripheral intravenous access could experience inadvertent VAE, anesthesia-related procedures such as central venous access, epidural catheter placement, and use of a rapid infusion system place patients at increased risk of more serious VAEs. Perioperative surveillance for and diagnosis of VAE is commonly accomplished with precordial Doppler and transesophageal (and transthoracic) echocardiography. In all VAE cases, the mainstay of management includes immediate avoidance of further air entrainment. In severe cases, treating the patient's cardiopulmonary instability should include possible aspiration of the air from the right heart and hyperbaric oxygen therapy.[2] Finally, utilization of the left lateral decubitus patient position may serve to ameliorate an air lock in the right heart (Figure).

Conflicts of interest None declared.

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