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PHOTO ESSAY

Incidental findings of multiple air emboli in the brain and orbit

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Abstract

An incidental findings of multiple air bubbles at the right skull base and in the superior ophthalmic vein of an 87 year-old female is presented. Venous air bubble is usually a minor accident with no side effects, but it holds the risk of cardiopulmonary arrest or stroke if large amount of air is introduced. Every peripheral intravenous catheterization or injection might cause hazardous air emboli and should be performed while taking the standard precautions.

Bubbles of air are commonly introduced to the circulation in admitted patients. Various causes are related to hospital procedures, but intravenous injections are considered the most common etiology.[1] Usually, it is a clinically insignificant finding with no adverse effects. However, if a large amount of air is introduced, severe complications and even death may occur. Studies estimate that the injection of over 200–300 ml is hazardous and may lead to severe sequelae.[2]

While circulating in the respiratory system, the air bubbles are usually absorbed and are asymptomatic. If the bubbles reach the cerebral circulation (through a patent foramen ovale, e.g.), it can cause a cardiorespiratory failure or stroke.[3,4] In these cases, patients may suffer from shortness of breath, confusion, headaches, and loss of consciousness.

Here, we present an incidental finding of air bubbles in a brain computed tomography (CT) scan. An 87-year-old female was admitted at postictal state, with fever and urosepsis. Medical history revealed a rapid cognitive decline and physical deterioration following a femur fracture 1 year before admission. She also developed atrial fibrillation and a new convulsive disorder. At admission, she had no shortness of breath, headaches, or visual disturbances. Aortic regurgitation without heart failure was documented. Radiological findings included multiple air bubbles at the right masticator space and two elongated bubbles in the superior ophthalmic vein of the right orbit [Figure 1a and b].

A similar case was previously reported following an intravenous injection in an 83-year-old female.[5] Massive venous air bubbles are not common following intravenous injections, although small bubbles are frequently encountered. Additional etiologies include trauma or catheterization. Risk factors that may be contributed to air embolism, relevant to this case, are venous stasis in the atria due to atrial fibrillation. Breath holding required during injection of contrast agents at CT scans was also suggested to be a risk factor by increasing the intrathoracic pressure.[5] Any patient with a peripheral intravenous catheter is considered at risk. Intensive catheterization and rapid infusion can increase this risk.[4]

Here, we describe massive air bubbles found incidentally on a CT scan. The patient did not show adverse sequelae, and the air bubbles resolved spontaneously. Elderly patients, especially

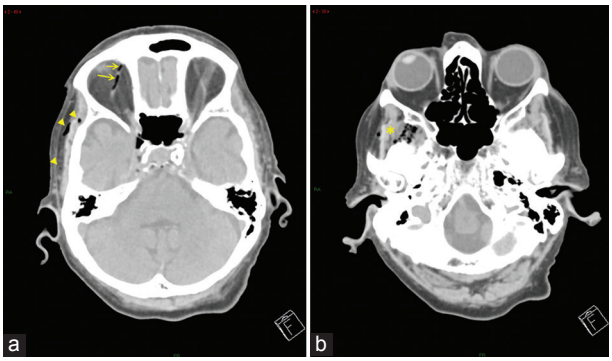

Figure 1: Axial contrasted computed tomography scan of orbits showing two elongated air bubbles in the right superior ophthalmic vein (a. arrows), some subcutaneous bubbles in the temporal region (a. arrow heads) and multiple air bubbles in the masticator space (b. asterisk)

debilitated and confused patients who need nursing care and assistance, should be followed carefully by an experienced team during intravenous fluid and medication administration. This routine procedure may result in lethal complications if not performed correctly and monitored according to the clinical guidelines.

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