

# Cardiac gas embolism after central venous catheter removal.

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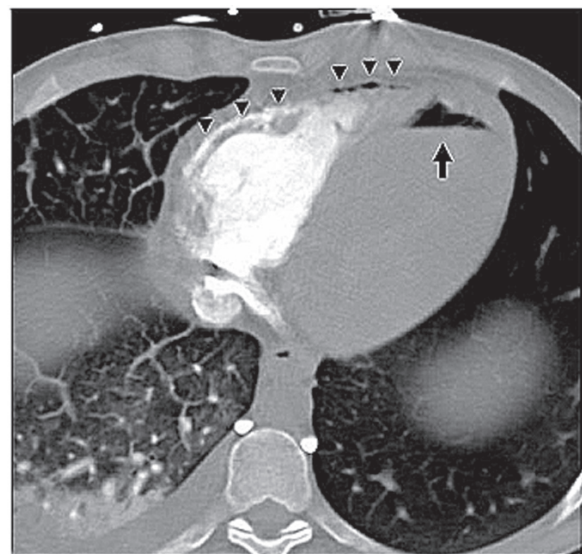
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Vignaux O, Borrego P, Macron L, Cariou A, Claessens Y-E. Cardiac gas embolism after central venous catheter removal. *Undersea Hyperb Med* 2005; 32(5):325-326. Clinical images reporting intracardiac gas level are sparse and, to our knowledge, the presence of gas embolism into the coronary arteries has never been reported. We describe the case of a young man who experiences life-threatening gas embolism with the presence of gas bubbles into cardiac cavities and coronary arteries.

Gas embolism is a severe condition responsible for multiple organ failure leading to death of more severe patients (1). Clinical images reporting intracardiac gas level and coronary arteries bubbles are sparse. Mokhlesi et al reported CT scan images of air embolism into coronary arteries obtained during a lung biopsy procedure (2). However, coronary arteries gas embolism remains unfrequent using CT scan. We describe the case of a young man who experiences life-threatening gas embolism with the presence of gas bubbles into cardiac cavities and coronary arteries.

A 18-year-old man was referred to the ICU after a liver transplant for an Alagille syndrome-related cirrhosis. Post-operative course was unremarkable. Before discharge, a subclavian open-tip venous catheter was removed in a supine patient breathing air spontaneously, who subsequently lost consciousness with convulsions, and then suffered of ventricular fibrillation responsible for cardiac arrest. The cardiopulmonary resuscitation lasted 45 minutes before return of spontaneous circulation. A sixteen-slice brain and chest CT scan allowed the diagnosis of massive gas embolism, showing multiple gas bubbles into the brain arteries and (Figure 1) a gas level into the left ventricular cavity (arrow)

and right apical epicardial gas bubbles with right intramyocardial stagnation of contrast media (arrow heads) suggesting right coronary artery gas embolism. Transoesophageal echocardiography showed gas bubbles into right and left cardiac cavities without evidence for a right to left shunt including septal foramen. Hyperbaric oxygenotherapy began three hours after the event, and supportive care included mechanical ventilation with pure oxygen,



**Fig. 1.** Cardiac CT scan showing a gas level into the left ventricular cavity (arrow) and right apical epicardial gas bubbles with right intramyocardial stagnation of contrast media.

vasopressors, renal replacement therapy because of deep lactic acidosis and the use of coagulation factors in order to correct a profound disseminated intravascular coagulation. In spite of these treatments, the patient died 72 hours later because of irreversible multiple organ failure. Necropsy was waived by the relatives.

Whereas its incidence is underestimated, the occurrence of gas embolism related-life-threatening conditions remains infrequent in emergency medicine (1). Additionally, images of severe gas embolism are poorly reported in the literature. Recently, two interesting cases of severe gas embolism were published. Two reports in the Lancet described gas bubbles into the brain arteries (3,4) as described in our report. Recently, a case of cardiac gas embolism was published in the Clinical Images section of the New England Journal of Medicine (5). The very unusual findings in our report were the presence of gas in the right coronary artery, and a considerable gas level into the left ventricle.

This case underlines that gas embolism should be considered in patients who experience disorders after removal of central venous devices including a proper procedure according to previous authors (6). However, the exact mechanism of air issue remains unclear in our case study as necropsy was unavailable.

## REFERENCES

1. Muth C. M., Shank E. S. Gas Embolism *N Engl J Med.* 2000; 342:476-482.
2. Mokhlesi B, Ansaarie I, Bader M, Tareen M, Boatman J. Coronary artery air embolism complicating a CT-guided transthoracic needle biopsy of the lung. *Chest.* 2002;121:993-6.
3. Ploner F, Saltuari L, Marosi MJ, Dolif R, Salsa A. Cerebral air emboli with use of central venous catheter in mobile patient. *Lancet.* 1991;338:1331.
4. Valentino R, Hilbert G, Vargas F, Gruson D. Computed tomographic scan of massive cerebral air embolism. *Lancet.* 2003;361:1848.
5. Teichgräber U.K.M, Benter T. Air Embolism after the Insertion of a Central Venous Catheter. *N Engl J Med.* 2004;350:e17.
6. Ely EW, Hite RD, Baker AM, Johnson MM, Bowton DL, Haponik EF. Venous air embolism from central venous catheterization: a need for increased physician awareness. *Crit Care Med.* 1999;27:2113-7.