

Cerebral air embolism after flushing a radial arterial line: a case report

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Received: 30 November 2020; Accepted: 02 April 2021; Published: 25 July 2021.

doi: 10.21037/jeccm-20-174

View this article at: <http://dx.doi.org/10.21037/jeccm-20-174>

The hazard of air embolism from flushing a radial arterial line has so far only been reported in neonates. We observed fatal air embolism in a 61-year-old woman, who underwent major surgery for ovarian cancer. She suddenly lost consciousness after a blood sample was taken from the arterial line. The patient was intubated and ventilated immediately after the event and remained hemodynamically stable. A computer tomography of the brain that was performed 40 minutes after the loss of consciousness revealed intracerebral and intravascular air embolism (*Figure 1*). The patient was transferred for hyperbaric therapy but developed brain oedema and died from brain death despite therapy. After the event the flushing bag of the arterial line was found empty with air in the pipe. Flushing bags of the same batch were found to contain >100 mL of gas (usually 5–20 mL). From the empty flushing bag, the gas was pressed into the pressure transducer, which is constructed to guarantee continuous flow of liquid but not of gas, and into the radial artery. Experimentally, 2 mL of air injected into the radial artery results in a retrograde passage into the vertebral system and the brain. Manual flushing with >1 mL/s produces a retrograde flow in the proximal axillary artery. Due to raised upper body the gas went from the aortic arch into the brain-supplying arteries of our patient. In conclusion, when preparing an arterial transducer set, all gas must be removed from the system and the bag. Air embolism from an arterial line can cause neurological deficit up to brain death.



Figure 1 Multiple air bubbles (arrows) in the arterial brain vessels.

Acknowledgments

Funding: None.

Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org>).

[org/10.21037/jeccm-20-174](https://doi.org/10.21037/jeccm-20-174)). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Written informed consent was obtained from the husband of the patient for publication of this study and any accompanying images.

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Cite this article as: Zink M, Hainzl G, Maier A, Stadlbauer V. Cerebral air embolism after flushing a radial arterial line: a case report. *J Emerg Crit Care Med* 2021;5:28.