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Air Embolism: Placement of Central Venous Catheters

To the Editor:—Numerous publications during the last few years have been concerned with the use of central venous catheters in the detection and treatment of venous air embolism. In this context, the recent editorial[1] in ANESTHESIOLOGY is welcome. A recent survey of neurosurgical centers in the United Kingdom showed that in 52 per cent a right atrial catheter is routinely inserted in patients undergoing surgery in the sitting position,[2] although it is possible that this figure has increased slightly during the time that has elapsed since the data were first collected (1978–1979). Our own practice is to introduce a venous catheter via an arm vein after the induction of anesthesia and to confirm the location of the catheter tip by chest radiography. During the ten to fifteen minutes that elapses before the radiograph is available, the patient is positioned upright. If the catheter is then found to be incorrectly sited, no further attempt is made and we rely on intra-arterial blood pressure measurement and a Doppler ultrasonic probe. An end-tidal CO_2 analyzer will be available shortly.

Interestingly, a personal unpublished series confirms almost exactly the 10 per cent failure rate and time of 10–15 minutes required for the procedure that has been reported by others.[3] To our knowledge no institution in the United Kingdom currently uses a pulmonary artery catheter and in our view the potential risk, cost, and time involved precludes the routine use of this monitoring device.

In two patients at the Mayo Clinic large volumes of air were withdrawn via catheters in the superior vena cava (SVC)[1] and Bunegin *et al.*,[4] using their experimental model, have found that with a single-orifice catheter the optimal position of the tip is 3.0 cm above the junction of the SVC and right atrium. The following case report, therefore, may be of interest.

REPORT OF A CASE

A 22-year-old woman with signs and symptoms of obstructive hydrocephalus underwent posterior fossa craniotomy for removal of a large mid-line space-occupying lesion. After induction of anesthesia, a venous catheter was inserted via the left basilic vein but chest radiography showed that the catheter tip had passed upwards into the right internal jugular vein (fig. 1). The catheter was withdrawn until it was judged that the tip lay in the SVC. Anesthesia in the sitting position using nitrous oxide, oxygen, pancuronium, and fentanyl was uneventful until craniectomy and dural opening had been completed. However, tumor retraction caused immediate arterial hypotension to 50 mmHg systolic and simultaneous positive Doppler signals. The operation site was covered with a moist pack and 30 ml of air were withdrawn from the SVC. The blood pressure returned to normal within 90 s, and since the surgeon could find no obvious entry site the pack was removed and the tumor retracted once more. A second episode of hypotension (45 mmHg) and positive Doppler signals almost immediately occurred; 20 ml of air was aspirated.

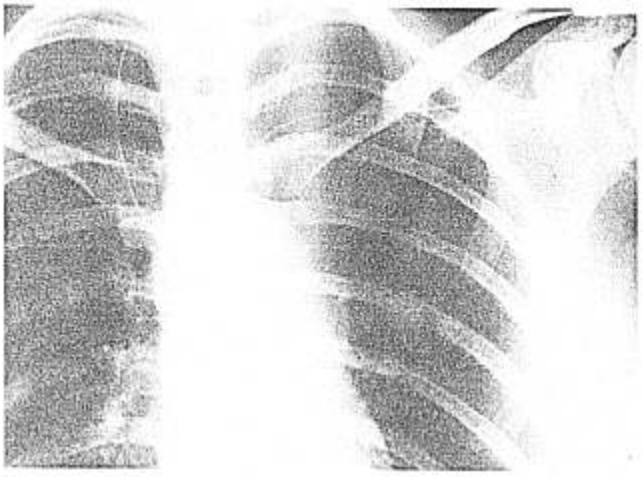

FIG. 1. The central venous catheter introduced via the left basilic vein has passed upwards into the right internal jugular vein.

No entry site was visible, the patient was placed prone, and the operation continued. Retraction of what proved to be a large epidermoid now revealed an open venous sinus deep to the tumor. Following complete tumor removal the patient made an uneventful recovery.

This illustrates the occasional case in which sudden entry of a large volume of air occurs without premonitory Doppler activation and in which the presence of a venous catheter is of great value. It also confirms that significant volumes of air can be retrieved when the catheter tip is sited in the superior vena cava.

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Editorials Should Elucidate Not Obfuscate

To the Editor:—What a shame that the issue of halothane hepatitis should be further clouded by the recent editorial.[1] The clarity of prose and thought expressed by Louis Carroll in the quotation from "Through the Looking Glass" which preceded the editorial was regrettably not continued by Dr. Burnell Brown. Anesthesiologists find it difficult enough to unravel some of the mysteries of halothane hepatitis without being further bombarded by an unnecessary challenge to their working vocabularies. The functions of an editorial are to comment, stimulate, and provoke further interest in the subject discussed. Editorials such as this fail to achieve all those objectives but may instead drive us to our dictionaries. Perhaps a glossary of terms will ease the agonies of readers of editorials in ANESTHESIOLOGY in the future.

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