NEUROLOGICAL PICTURE

Air embolism due to a patent foramen ovale visualised by harmonic contrast echocardiography

A 73 year old woman presented with impaired consciousness after 3 days of uneventful recovery from surgery for rectal cancer. The patient became comatose, and her blood pressure dropped to 70 mm Hg. The total parenteral nutrition infusion line into the right subclavian vein had been disconnected temporarily and by accident just before the episode. Cerebral CT showed branch-like structures with air density in the right frontal lobe (fig 1 A), which strongly suggested cerebral air embolism. The patient gradually regained consciousness, and moderate hemiparesis on the left side was noticed. Cerebral angiograms were unremarkable, and on the repeat CT obtained 3 hours after onset, the air was gone.

Contrast echocardiography performed after 3 days showed nothing remarkable, partly because the patient was not able to cooperate adequately. Two months after the episode onset, however, harmonic echocardiography with micro air bubbles as a contrast medium demonstrated passage of the bubbles from the right to the left atrium under

the Valsalva manoeuvre (fig 1 B). Thus, an occult patent foramen ovale was documented.

Air embolism is a rare complication of total parenteral nutrition. When a patent foramen ovale is small, the right to left shunt is difficult to detect on conventional echocardiograms. Harmonic contrast echocardiography with the Valsalva manoeuvre is superior in such cases and is as useful as transesophageal contrast echocardiography in detecting the small patent foramen ovale.¹

S KUBO

Department of Neurosurgery, Osaka Neurological Institute, Osaka, Japan

H NAKATA

Department of Neurosurgery, Takarazuka Municipal Hospital, Hyogo, Japan

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Figure 1 (A) Cerebral CT shows air in the cortical vessels along the sulci in the right frontal lobe. (B) Four chamber view of a contrast echocardiogram in the harmonic mode showing the escape of several bubbles (arrows) to the left atrium from the right atrium. The right chambers are filled with microbubbles.