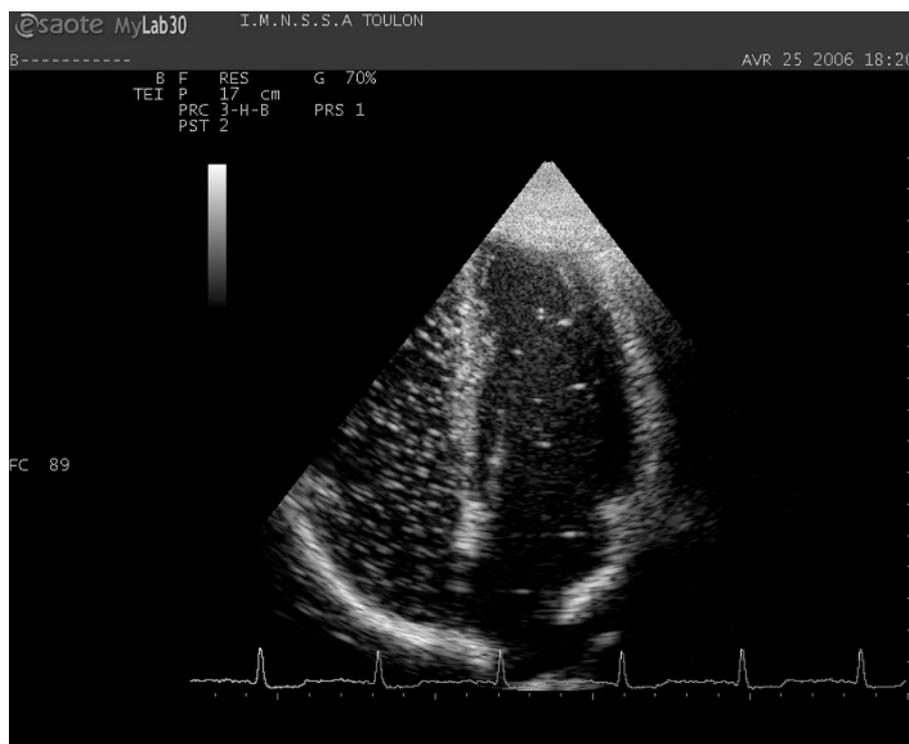


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## Images in cardiology

### Bubbles in the left cardiac cavities after diving

After scuba diving, circulating nitrogen bubbles can be detected in the venous system. In two subjects, we detected circulating bubbles in both right and left cavities of the heart and in the cerebral circulation. Several risk factors of paradoxical gas embolism are suggested here. The two divers developed a high bubble grade after surfacing. The right to left shunting occurred through a large patent foramen ovale (PFO). An increase in bubble grade in right cavities and an increase in arterial passage through the inter-atrial septal defect were observed during isometric contraction of lower limb muscles. Although they remained asymptomatic, our two divers should be considered at high risk of developing neurological decompression sickness (DCS). Indeed, the presence of a PFO has been associated with the risk of developing a DCS<sup>1</sup> and with the incidence of ischaemic brain lesions.<sup>2</sup> Haemodynamic modifications were assessed using Doppler-echocardiography. All the parameter modifications were consistent and suggested a decrease in cardiac preload after the dive. Furthermore, an increase in pulmonary vascular resistance was observed, which could promote the right-to-left shunting. A closure of the PFO could be discussed in these subjects. However, this procedure did not change the high level of venous circulating bubbles and the risk of developing an unrelated interatrial shunt DCS. Consequently, in subjects wishing to pursue their diving activity an appropriate preventive measure could be the use of oxygen-enriched



Circulating bubbles in the right and the left cavities of the heart.

mixture to decrease the nitrogen load and the risk of all types of DCS.

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► Supplementary figure and video (passage of the circulating bubbles in the left cardiac cavities) available online at <http://heart.bmj.com/content/vol94/issue4>

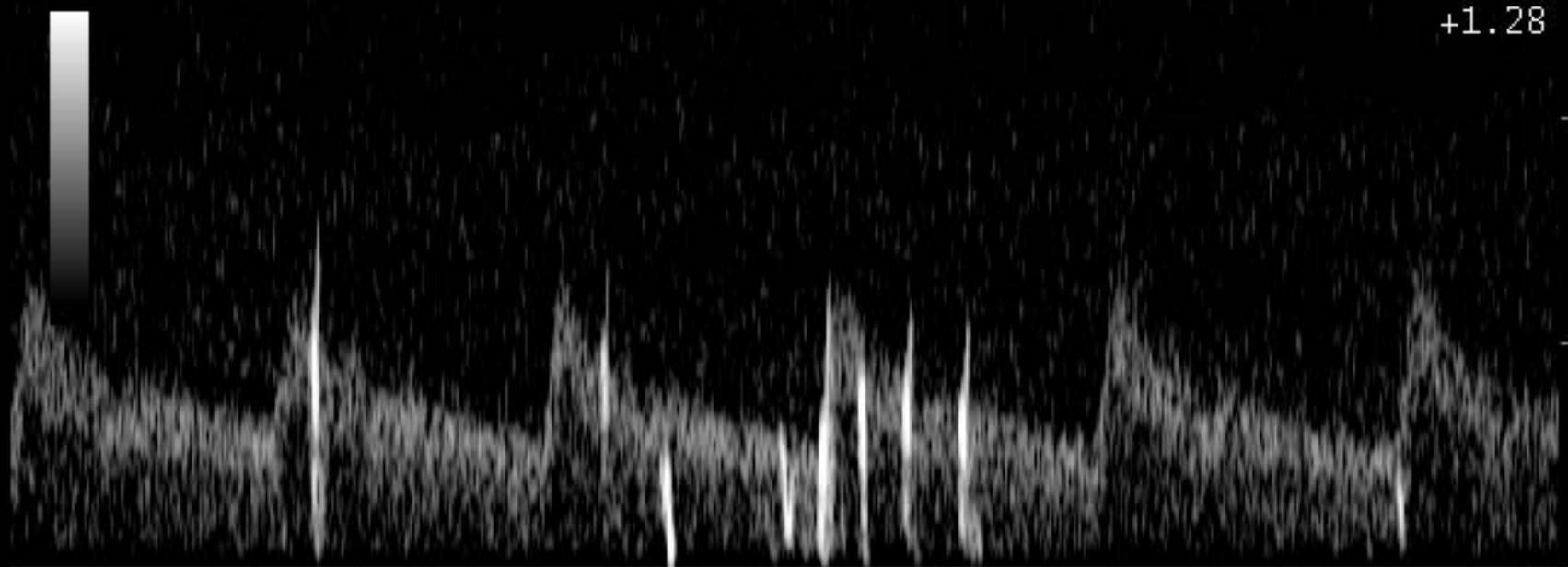
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B F 3.5 MHz G MAX  
P 13 cm  
PRC 6-B-B PRS 1  
PST 1  
SV 4- 53mm

PW F 2.5 MHz G 80%  
PRF 8.3kHz  
PRC 6-1  
PST 2  
FP 100 Hz

+1.28



m/s

FC 77

