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## Waves in the liver

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### IMAGES IN MEDICINE

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The image and video show a striking phenomenon that can occur during contrast-enhanced ultrasound of the liver. A man was referred for contrast-enhanced ultrasound-guided biopsy of a suspected liver metastasis. After the biopsy, the liver was scanned with conventional greyscale ultrasonography (high acoustic energy). An echo-rich/light wave then emerged that seemed to roll back and forth through the hepatic tissue. The similarity to the northern lights was striking.

Contrast medium that is administered intravenously contains numerous bubbles of gas that are roughly equal in size to blood cells. The bubbles circulate in the blood and give rise to increased echoes from the tissue. Metastases will usually appear dark. Eventually the bubbles burst, in part because of the energy from the ultrasound waves, and an intense short-lived echo occurs. An ultrasound programme with low acoustic energy was used to delay bubble bursting.

This phenomenon has been described previously (1). The echo-rich wave represents the ongoing bursting of bubbles due to the high acoustic energy. It occurs at the boundary between the ventral part of the liver, which is echo-poor and where most bubbles have already burst, and the dorsal part, which is echo-rich and where fewer bubbles have burst. The wave appears to move back and forth as a result of movement of the ultrasound probe and as the patient breathes. Moreover, the continual bursting of bubbles causes the wave to move slowly dorsalwards. We used the contrast agent Sonazoid. The bubbles in this contrast agent are robust in the face of acoustic pressure, and tolerate more ultrasound sweeps before bursting. The waves do not occur during low-energy scanning, but emerge immediately after switching to high energy. We have reproduced this effect on multiple occasions and in different patients.

The phenomenon is an artefact and has no clinical significance, but is useful to be aware of for those who practise contrast-enhanced ultrasound with Sonazoid.

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*The patient has consented to the publication of this article.*

*GE Healthcare, the manufacturer of the contrast agent discussed in the article, has paid for the English translation. They have had no influence on the content of the article.*

*The article has been peer-reviewed.*

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## LITERATURE

1. Edey AJ, Ryan SM, Beese RC et al. Ultrasound imaging of liver metastases in the delayed parenchymal phase following administration of Sonazoid using a destructive mode technique (Agent Detection Imaging). *Clin Radiol* 2008; 63: 1112–20. [PubMed][CrossRef]

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