

Countless uninvited guests in left atrium

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Received 17 June 2020; first decision 17 July 2020; accepted 12 October 2020

A 52-year-old man with diabetes mellitus, old stroke, and alcoholic liver cirrhosis presented to the emergency department for acute dyspnoea. Mild cardiomegaly on chest X-ray and reduced O₂ saturation on ABGA (arterial blood gas analysis) of 81.7% under room air were noted. Chest computed tomography (CT) revealed dilatation of peripheral pulmonary vessels in both lower lobes. Abdominal and pelvic CT revealed liver cirrhosis with signs of portal hypertension—such as oesophageal, gastric varices, open umbilical collaterals, perisplenic collaterals, and gastrorenal shunt and ascites. Platelet count was reduced to 50 000/μL and prothrombin time was prolonged to 25.0 s (normal 10.0–13.4).

Transthoracic echocardiography showed normal left ventricular systolic function and mild enlargement of the left atrium. A very large amount of microbubbles in left heart after four beats since they appeared in right atrium was seen on contrast echocardiography with agitated saline injection (Figure 1, arrowheads indicate bubbles in left heart; Video 1).

^{99m}Tc-labelled macro-aggregated albumin scintigraphy (^{99m}Tc-MAA) revealed a weak silhouette of the kidney (Figure 2, arrowheads indicate both kidneys compared with invisible kidneys in a normal person). He was diagnosed as hepatopulmonary syndrome (HPS) with liver cirrhosis and proceeded to perform liver transplantation.

Hepatopulmonary syndrome has been reported in between 4% and 29% patients with end-stage liver disease.^{1,2} Contrast echocardiography is considered the standard technique in HPS showing agitated saline bubbles in left cavities after injected into a peripheral vein. In ^{99m}Tc-MAA, ^{99m}Tc labelled albumin particles are injected into a peripheral vein and can reach extrapulmonary sites like the parenchyma of the brain or kidneys due to the presence of an intrapulmonary arteriovenous shunt.³

Contrast echocardiography using agitated saline and ^{99m}Tc-MAA are sensitive diagnostic tools for intrapulmonary arteriovenous shunt

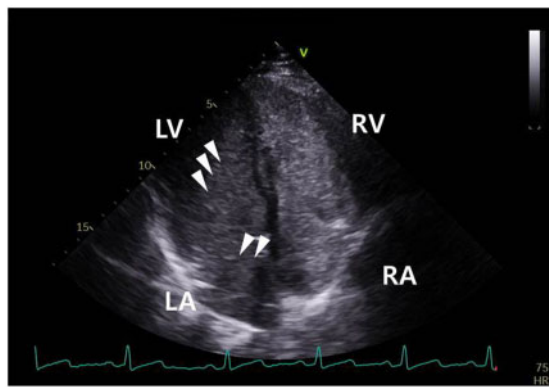
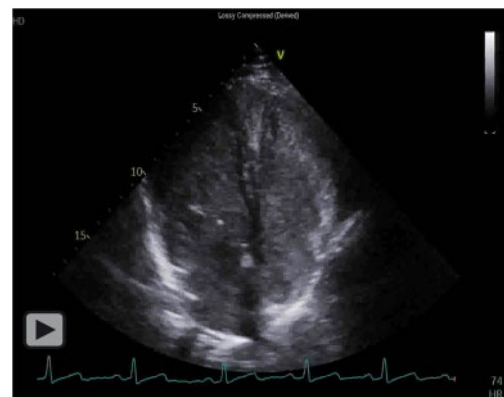


Figure 1 A very large amount of microbubbles in left heart after four beats since they appeared in right atrium was seen on contrast echocardiography with agitated saline injection (arrowheads indicate bubbles in left heart). LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle.



Video 1 A very large amount of microbubbles in left heart after four beats since they appeared in right atrium was seen on contrast echocardiography with agitated saline injection.

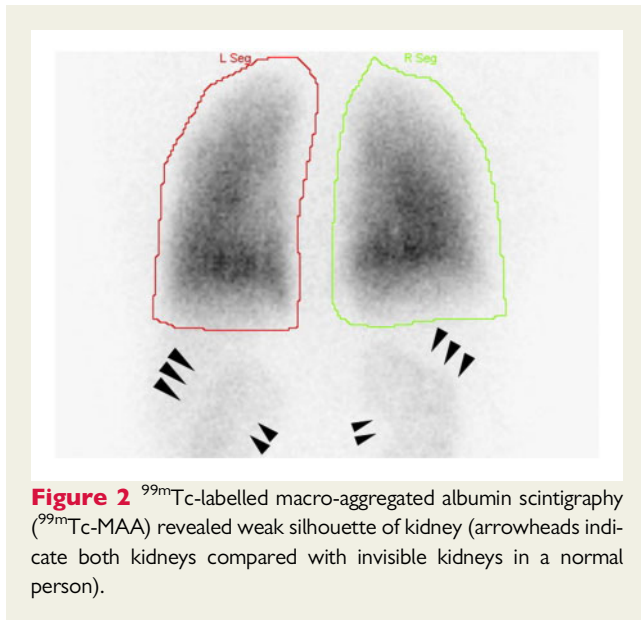
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Handling Editor: Alberto Bouzas-Mosquera

Peer-reviewers: Rami Riziq Yousef Abumuaileq and Marcelo Haertel Migioranza

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in HPS. The clinical efficacy and significance of contrast echocardiography in patients with liver cirrhosis and hypoxia should be emphasized if there is no abnormality on their lung and heart.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: none declared.

Funding: None declared.

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