


CASE IMAGE

Hepatic encephalopathy due to cardiac cirrhosis

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Key Clinical Message

Right-sided heart failure, including tricuspid regurgitation (TR), can cause cardiac cirrhosis. The pathophysiology is reduced arterial perfusion and passive congestion secondary to increased systemic venous pressure. However, hepatic encephalopathy due to cardiac cirrhosis is rare. This is the first case of hepatic encephalopathy with cardiac cirrhosis caused by persistent TR.

KEYWORDS

cardiac cirrhosis, hepatic encephalopathy, portal hypertensive gastropathy, tricuspid regurgitation

1 | CASE HISTORY

An 82-year-old man with severe tricuspid regurgitation (TR) presented with a 4-day history of fatigue. His past medical history included TR, diabetes mellitus, chronic kidney disease, and atrial fibrillation. His family history was unremarkable. Twenty-one years ago, he was diagnosed with chronic heart failure due to a primary TR. He noticed a gradual worsening of his leg edema and abdominal distension over the past year. One month prior to hospitalization, he had hematochezia and colonoscopy was performed, although no clinical findings were seen. On arrival at our hospital, his vital signs were stable, but he was lethargic, and his Glasgow Coma Scale score was E3V4M6. Physical examination revealed prominent distention of the jugular vein, a holosystolic murmur at the left inferior sternal border that increased with inspiration, ascites, hepatojugular reflux, and scleral icterus, but asterixis could not be assessed because of impaired consciousness. No liver tenderness was noted. Transthoracic echocardiography showed severe TR (Figure 1A) with dilated intravenous vena cava (IVC). Computed tomography showed severe dilatation of the

IVC, splenic vein (SV), and splenomegaly (Figure 1B). Laboratory results displayed hyperammonemia (250 µg/dL) and pancytopenia, but no elevation of hepatobiliary enzymes. Therefore, he was hospitalized for further evaluation and treatment of hepatic encephalopathy. He was treated with branched-chain amino acids and lactulose. However, the melena recurred, and upper gastrointestinal endoscopy revealed oozing hemorrhage with cherry-red spots (Figure 1C).

We finally diagnosed hepatic encephalopathy due to gastrointestinal spread of portal hypertensive gastropathy (PHG), possibly caused by cardiac cirrhosis with prolonged TR. The patient was treated with an increased dose of diuretics (furosemide 40 mg, spironolactone 25 mg, and tolvaptan 15 mg once daily by mouth) in addition to hepatoprotective medications (infusion of AMINOLEBAN® (amino acid preparations for hepatic insufficiency) 500 mL per day, followed by branched-chain amino acids, such as L-isoleucine, L-leucine, and L-valine, 4.5 g, and lactulose 12 g three times daily by mouth), and his responsiveness gradually improved. Although surgery for TR or portal hypertension including splenectomy was considered, the patient was reluctant to undergo surgery at such

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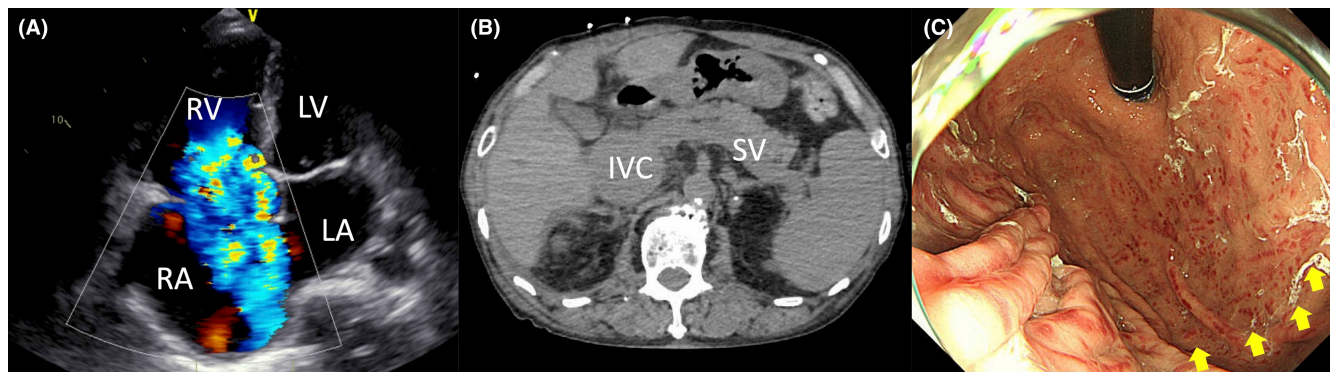


FIGURE 1 (A) Transthoracic echocardiography showing severe tricuspid regurgitation. LA; left atrium, LV; left ventricle, RA; right atrium, RV; right ventricle. (B) Computed tomography showing severe dilatation of the intravenous vena cava (IVC), splenic vein (SV), and splenomegaly. (C) Upper gastrointestinal endoscopy revealing oozing hemorrhage with cherry-red spots (arrows).

an advanced age. The patient was finally transferred to another hospital for further management of TR and liver cirrhosis.

2 | DISCUSSION

The pathophysiology of cardiac cirrhosis includes reduced arterial perfusion, whose deleterious effects are amplified by concomitant hypoxia, and passive congestion secondary to increased systemic venous pressure.¹ Cardiac hepatopathy is described as liver disease that occurs due to heart failure, and right-sided heart failure of any cause, including TR, can cause cardiac hepatopathy and even hepatic encephalopathy.² Besides, PHG is diagnosed in a patient with portal hypertension by the characteristic endoscopic finding of small polygonal areas of variable erythema surrounded by a pale reticular rim in a mosaic pattern in the gastric fundus. PHG can cause acute or chronic bleeding and is positively correlated with the duration of portal hypertension and the presence of pancytopenia and splenomegaly.³ To our knowledge, this is the first case of hepatic encephalopathy with cardiac cirrhosis caused by persistent severe TR in a time span of 20 years. We suspected that severe TR caused tremendous IVC dilatation, portal hypertension, and splenomegaly, resulting in increased venous pressure in the gastric veins and PHG. Therefore, physicians should be aware of right-sided heart failure as a cause of hepatic encephalopathy.

AUTHOR CONTRIBUTIONS

Ryohei Ono: Conceptualization; investigation; writing – original draft; writing – review and editing. **Hiroki Goto:** Formal analysis; writing – review and editing. **Yuhei Oyama:** Formal analysis; writing – review and editing. **Kazuya Tateishi:** Formal analysis; writing – review and editing. **Hiroyuki Takaoka:** Formal analysis; writing

– review and editing. **Naoya Kato:** Formal analysis; writing – review and editing. **Yoshio Kobayashi:** Formal analysis; writing – review and editing.

FUNDING INFORMATION

None.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, Ryohei Ono, upon reasonable request.

CONSENT STATEMENT

Written patient consent has been signed and collected.

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