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Downhill Esophageal Varices Caused by Arteriovenous Fistula: A Case Report

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Case Report

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Abstract

Background

Esophageal varices are classified by the direction of blood flow as uphill or downhill. In downhill esophageal varices, flow is directed from the oral side toward the anal side, and the condition is uncommon, being detected in approximately 0.5% of gastroscopies. The pathogenesis of downhill esophageal varices is diverse and the underlying cause is often difficult to identify.

Case presentation

A 59-year-old woman was incidentally found to have severe esophageal varices during a routine health examination. She had no haematemesis or melena and no history of liver cirrhosis, and her liver function tests were normal, although she was positive for hepatitis B surface antigen. Varices involved both the proximal and the distal esophagus. Computed tomography angiography showed tortuous, dilated esophageal and gastric fundal veins together with dilated vessels in the lower neck. A first interventional angiogram showed early venous filling only; three months later, a second angiogram demonstrated a fistula between the left inferior thyroid artery and the esophageal vein, at the site of previous thyroid surgery. A diagnosis of downhill esophageal varices caused by an arteriovenous fistula was made, and the patient was followed up with comprehensive evaluation.

Conclusions

Downhill esophageal varices may result from an arteriovenous fistula even in the absence of superior vena cava obstruction, and are readily mistaken for uphill varices related to portal hypertension, particularly in patients with hepatitis B. Varices that predominate in the upper or middle esophagus, or that persist after a normal portal hypertension work-up, should prompt evaluation of the cervical and mediastinal vasculature.

Background

Downhill esophageal varices are a rare form of esophageal varices in which blood flows from the oral side toward the anal side, that is, from the upper esophagus toward the cardia; this contrasts with the far more common uphill varices of portal hypertension, in which flow is directed cephalad. Downhill esophageal varices are detected in approximately 0.5% of gastroscopies [1]. Their pathogenesis is diverse, and most reported cases have been associated with obstruction of the superior vena cava or the azygos vein, so that the underlying cause is often difficult to identify. Research on downhill esophageal varices remains limited and no authoritative guideline or consensus is available to guide clinical diagnosis and treatment [2].

We describe a patient in whom esophageal varices were found incidentally and in whom the cause proved to be an arteriovenous fistula at the site of previous thyroid surgery, a mechanism distinct from the caval obstruction usually held responsible for downhill varices.

Case presentation

A 59-year-old woman was admitted because esophageal varices had been found during a routine physical examination one week earlier. She had no symptoms of gastrointestinal bleeding such as haematemesis or melena. Gastroscopy performed at another hospital had revealed severe esophageal varices, and contrast-enhanced magnetic resonance imaging at the same hospital had shown thickening of the upper thoracic esophageal wall with varices.

Her past medical history included hepatitis B, with hepatitis B surface antigen, hepatitis B e antibody and hepatitis B core antibody all positive and normal transaminase levels; she had never received antiviral treatment. She had no history of liver cirrhosis. She also had a history of hyperthyroidism for which she had undergone thyroid surgery, the details of which were not available. Physical examination revealed no jaundice and no spider angiomas, and the liver and spleen were not palpable.

After admission, a series of laboratory tests and imaging examinations was performed. Liver function tests, bilirubin, coagulation profile, tumour markers and autoantibodies for autoimmune liver disease all showed no significant abnormality.

Esophagogastroduodenoscopy (Fig. 1) showed multiple varices in both the proximal and the distal esophagus. Contrast-enhanced computed tomography angiography (CTA) showed tortuous, dilated esophageal and gastric fundal veins, and tortuous dilated vessels were also noted in the lower neck.**Fig. 1** Esophagogastroduodenoscopy showing multiple varices in the proximal esophagus, distal esophagus and gastric fundus.

To determine the underlying aetiology, the procedure and its risks were explained in detail to the patient, who consented to interventional angiography. The first diagnostic angiogram (Fig. 2) showed early venous filling and moderate esophageal varices, but the aetiology remained unknown. The patient was therefore discharged and followed up in the outpatient clinic. Three months later, follow-up endoscopy and CTA showed no significant improvement of the esophageal varices. A second interventional angiogram (Fig. 3) was then performed and revealed a fistula between the left inferior thyroid artery and the esophageal vein.

Discussion

Downhill esophageal varices are a rare type of esophageal varices, characterised by blood flow directed from the oral cavity toward the cardia, and are commonly associated with obstruction of the superior vena cava or the azygos vein. The present case is unusual in two respects. First, the varices involved the upper esophagus, which is the location at which a non-portal cause should be suspected. Second, the

underlying mechanism proved to be an arteriovenous fistula producing increased blood flow in the esophageal veins, possibly as a consequence of the earlier thyroid surgery, rather than venous obstruction.

Such cases are prone to misdiagnosis as uphill varices related to portal hypertension. In our patient this risk was compounded by hepatitis B seropositivity, which initially pointed toward a portal cause even though there was no clinical or biochemical evidence of cirrhosis. Currently, research on downhill esophageal varices remains insufficient and there is a lack of authoritative guidelines or consensus to guide clinical diagnosis and treatment. In clinical practice, physicians should be particularly vigilant about the possibility of downhill esophageal varices when varices are located in the upper or middle esophagus, and should strive to identify the underlying cause, arrange follow-up monitoring, and initiate aetiology-directed therapy [2].

Conclusions

Downhill esophageal varices may be caused by an arteriovenous fistula in the absence of superior vena cava obstruction. When esophageal varices are identified in a patient without evidence of portal hypertension, and especially when the varices predominate in the upper or middle esophagus, imaging of the cervical and mediastinal vasculature should be considered before the findings are attributed to liver disease.

Abbreviations

CTA: computed tomography angiography; DEV: downhill esophageal varices; EGD: esophagogastroduodenoscopy; HBsAg: hepatitis B surface antigen; MRI: magnetic resonance imaging.

Declarations

Ethics approval and consent to participate

Ethical approval for this case report was obtained from the Ethics Committee of Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences (approval number:KY2026-544-01). All procedures were performed in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments.

Consent for publication

Written informed consent for publication of this case report and any accompanying images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

Availability of data and materials

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JL and BW conceived and designed the report. JL contributed to data curation, formal analysis, investigation, visualisation and funding acquisition, and drafted the manuscript. BW contributed to methodology, investigation, validation and supervision, and critically revised the manuscript for important intellectual content. Both authors read and approved the final manuscript.

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Figures

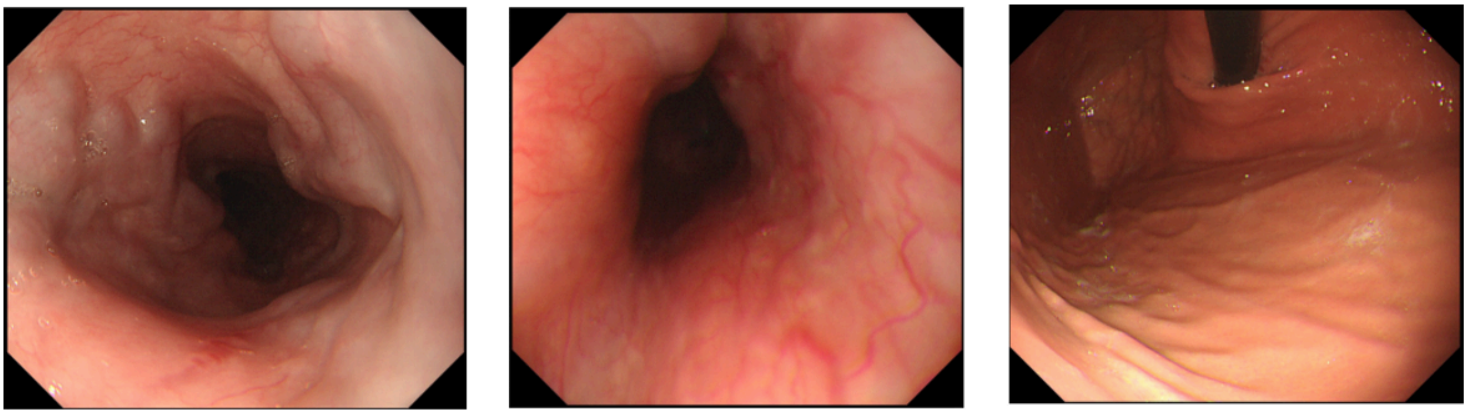


Figure 1

Esophagogastroduodenoscopy showing multiple varices in the proximal esophagus, distal esophagus and gastric fundus.



Figure 2

First interventional angiogram showing early venous filling and moderate esophageal varices.

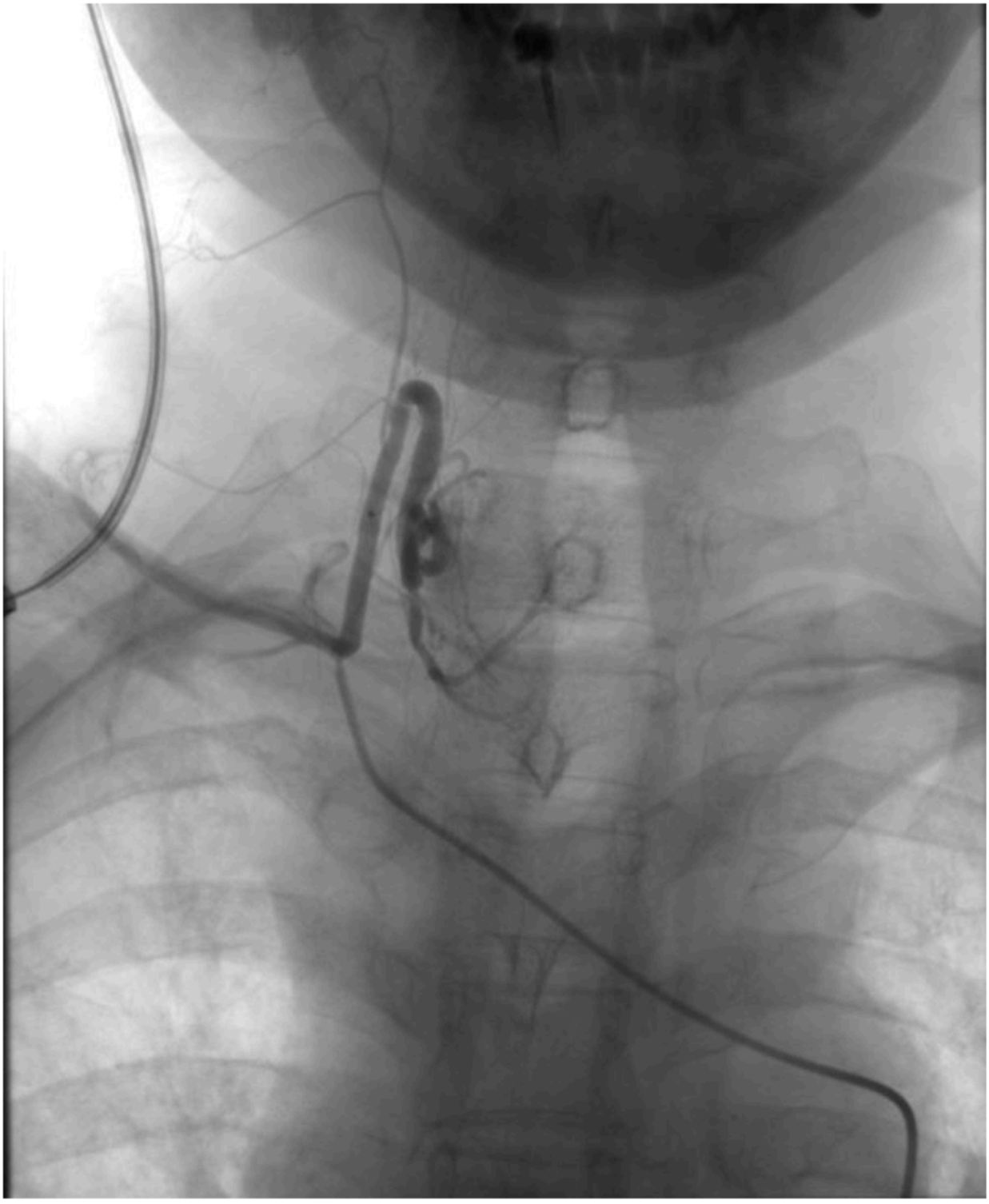


Figure 3

Second interventional angiogram demonstrating a fistula between the left inferior thyroid artery and the esophageal vein.