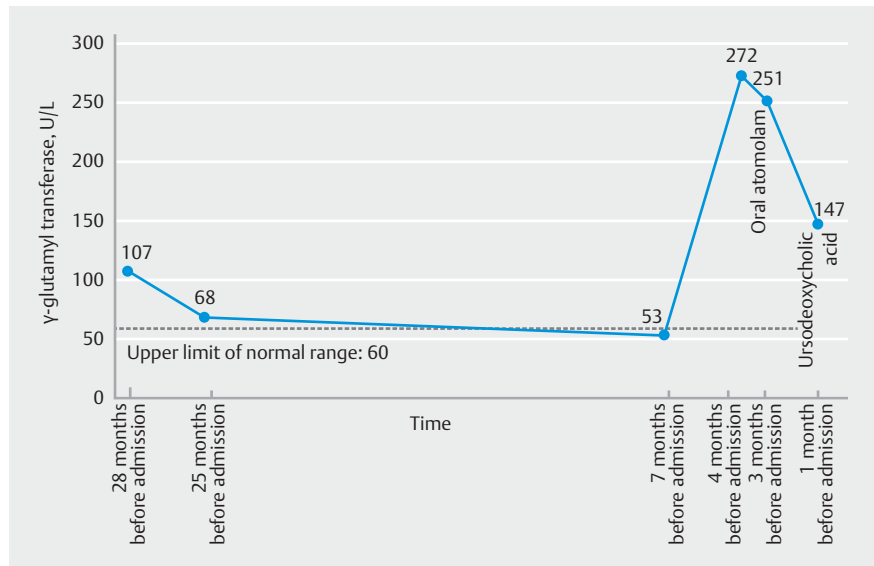


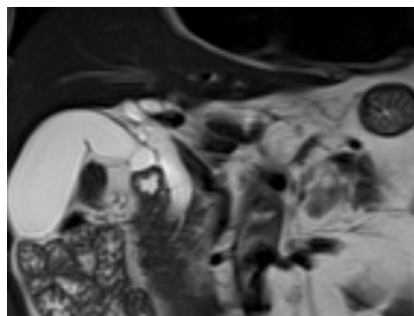
## An unusual case of isolated serum $\gamma$ -glutamyl transferase elevation: slight abnormality also should not be taken lightly

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A 75-year-old man was admitted to our hospital for isolated serum  $\gamma$ -glutamyl transpeptidase (GGT, 147 U/L) elevation, with fluctuation in the past 2 years (► Fig. 1). His alanine aminotransferase, glutamic transaminase, bilirubin level, and tumor markers were all in normal range. He had no symptoms, except for mild soreness in the right waist for 2 months. Magnetic resonance imaging (MRI) revealed a low signal in T2W with dilation of the common bile duct (CBD) to 12 mm and enlargement of the gallbladder (► Fig. 2). Hence, endoscopic ultrasound (EUS) was performed for a definite diagnosis. The major papilla was small with a normal surface (► Fig. 3). In the distal CBD, a hypoechoic nodule (13.1 × 7.2 mm) was found wriggling along with the sphincter contraction (► Fig. 4a). Contrast-enhanced EUS showed the enhancement of the lesion, but the degree was weaker than the peripheral pancreas (► Fig. 4b, ► Video 1). The patient was delivered for surgery, and intraoperative choledochoscopy indicated a villous tumor located in the terminal portion of the CBD with a soft texture. Finally, histological diagnosis indicated adenocarcinoma (protruded type, grade II) (► Fig. 5). The current case demonstrates a dilated CBD with an isolated serum GGT elevation should be checked for a suspected bile duct neoplasm, even without jaundice. An elevated serum GGT is a marker of hepatobiliary system injury and is associated with a risk of chronic disease [1] and is reported to be independently associated with a risk of cancer [2] and cancer prognosis [3]. Attention should also be paid to a slightly abnormal test; even if there is downward trend, it cannot be taken lightly. Clinically, such a manifestation is prone to be overlooked, especially when a significant mass is obsolete on imaging examination. In this case, the soft nodule restricted excretion of bile flow from the papilla, which verified by the appearance



► Fig. 1 The patient's serum  $\gamma$ -glutamyl transpeptidase fluctuation line in the past 2 years.



► Fig. 2 Magnetic resonance imaging revealed a low signal in T2W with dilation of common bile duct to 12 mm and enlargement of gallbladder.



► Fig. 3 Endoscopy view showed that major papilla was small with normal surface.

of atrophic papilla. Hence, the elevated pressure in the CBD only led to an elevated GGT, without an abnormal bilirubin level.

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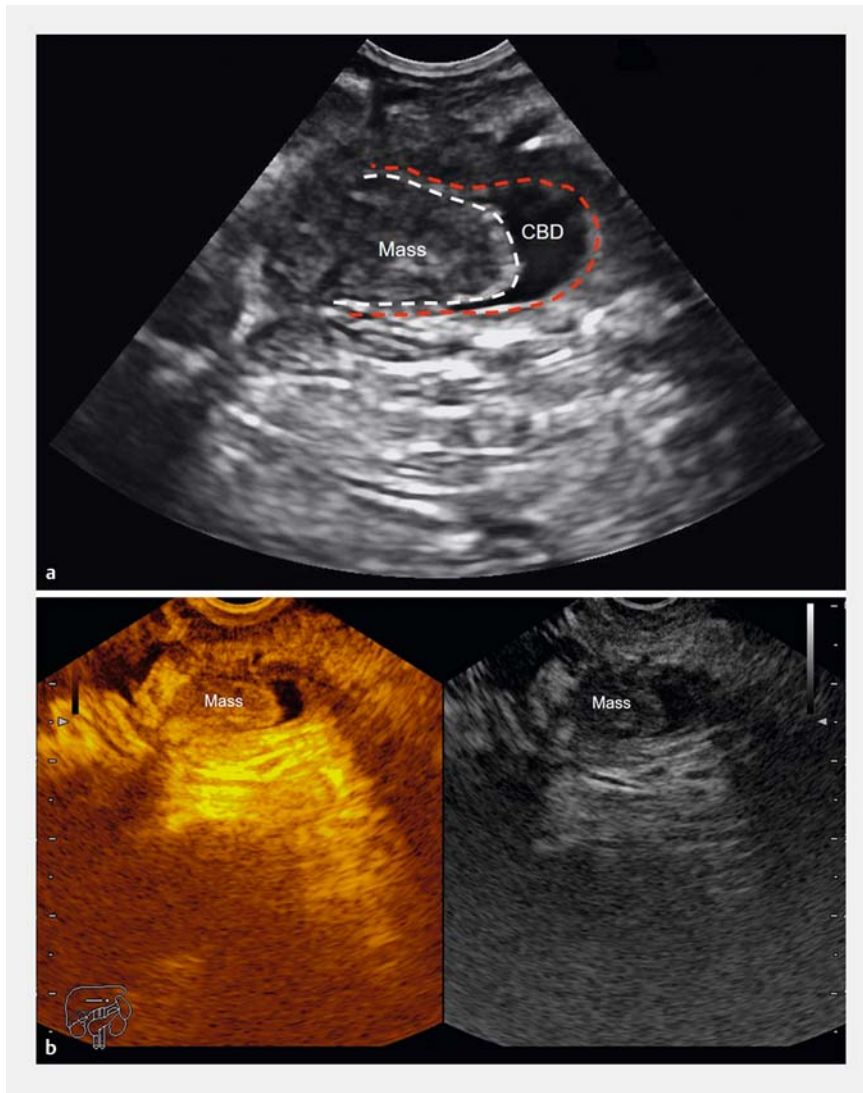
### Competing interests

The authors declare that they have no conflict of interest.

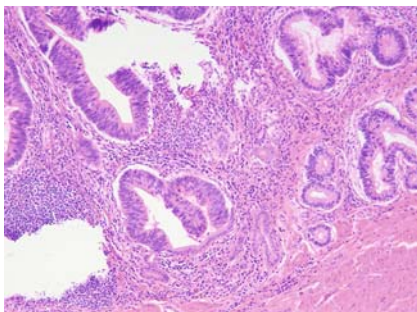
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► **Fig. 4** Endoscopic ultrasound images. **a** A hypoechoic nodule in the terminal portion of common bile duct. **b** Contrast-enhanced endoscopic ultrasound showed enhancement of the lesion.



► **Fig. 5** Histological diagnosis indicated adenocarcinoma.

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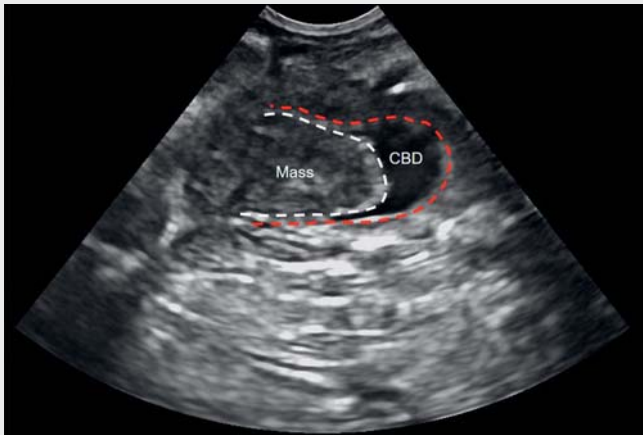
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**Video 1** Endoscopic ultrasound showed a hypoechoic nodule in the common bile duct. Contrast-enhanced endoscopic ultrasound showed the enhancement of the lesion, but the degree was weaker than the peripheral pancreas.

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