

# A rare complication of EUS-guided biliary drainage (with video)

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A 66-year-old female was diagnosed with pancreatic cancer a year ago and was admitted to the hospital due to jaundice for the past 2 weeks. Magnetic resonance imaging (MRI) showed a pancreatic mass with dilation of the upper common bile duct and intrahepatic bile ducts [Figure 1]. Liver function tests showed the total bilirubin (TBIL) level was 387.4  $\mu\text{mol/L}$ . The definite diagnosis was pancreatic cancer with obstructive jaundice.

The patient underwent EUS-guided biliary drainage (EUS-BD) due to duodenal stenosis [Figure 2]. Under EUS guidance, a 19-gauge needle was used to puncture the dilated bile duct in segment 2 of the liver [Figure 3A]. Contrast injection showed dilation of the intrahepatic bile ducts. A 0.025-inch guidewire was inserted through the puncture needle [Figure 3B]. An incision was made along the guidewire using a 6Fr cystotome, entering the intrahepatic bile duct. A 7Fr nasobiliary drainage tube was then inserted along the guidewire [Figure 4A]. The nasobiliary drainage tube then was cut with endoscopic scissors for gastroscopy [Figure 4B]. The EUS-BD procedure could be seen in Video 1. After nasobiliary drainage tube was cut, the patient suddenly experienced dyspnea, with oxygen saturation dropping to 80%. An emergency chest X-ray revealed a right-sided pneumothorax [Figure 5A]. Immediate closed thoracic drainage was performed. Three days later, a follow-up chest X-ray showed clear lung fields [Figure 5B], and the chest drainage tube was removed.

The main approaches for EUS-BD are through gastric or duodenal access, with reports of esophageal access as well.<sup>[1–3]</sup> A meta-analysis has revealed that the most common complications of EUS-BD are bile leakage, followed by cholangitis, and others include pneumoperitoneum, abdominal pain, and more.<sup>[4]</sup> To the best of our knowledge, this is the first reported case of pneumothorax

resulting from EUS-BD. During the adjustment of the puncture site, the needle accidentally shifted to the lower esophagus. The puncture needle penetrated the esophageal thoracic cavity into the intrahepatic bile duct. After using a 6F cystotome to cut through the esophageal wall into the intrahepatic bile duct, pneumothorax occurred. Neither metal stents nor plastic stents could prevent the occurrence of pneumothorax. The patient recovered after closed thoracic drainage. This case underscores a higher risk of pneumothorax with the esophageal approach during EUS-BD, highlighting the necessity for careful confirmation of the puncture site during the procedure.

## Video 1

The procedure for EUS-BD. Video is only available at the official website of the journal ([www.eusjournal.com](http://www.eusjournal.com)).

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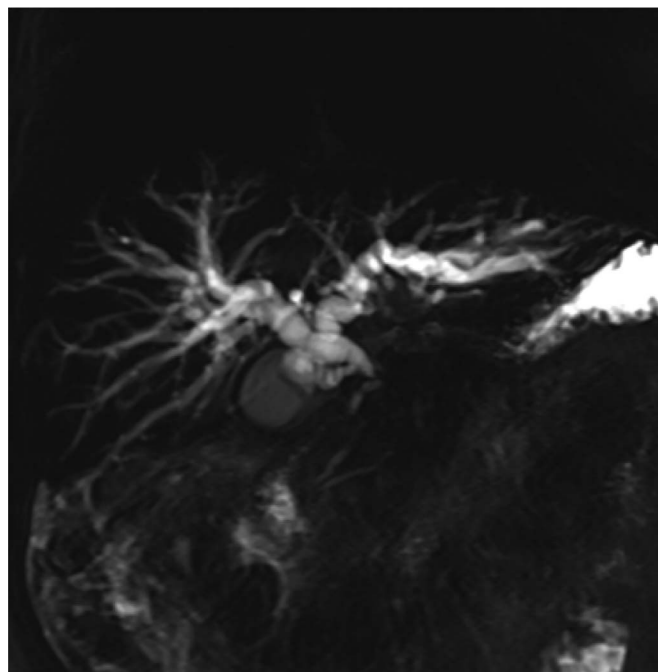
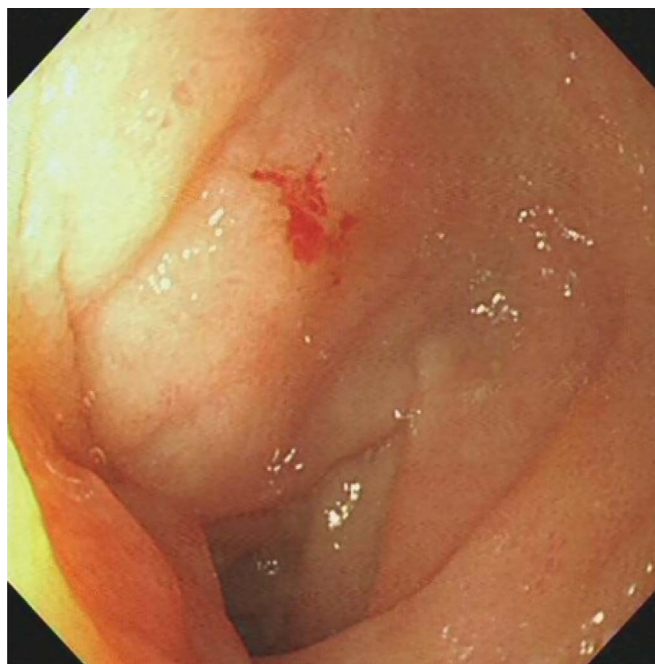
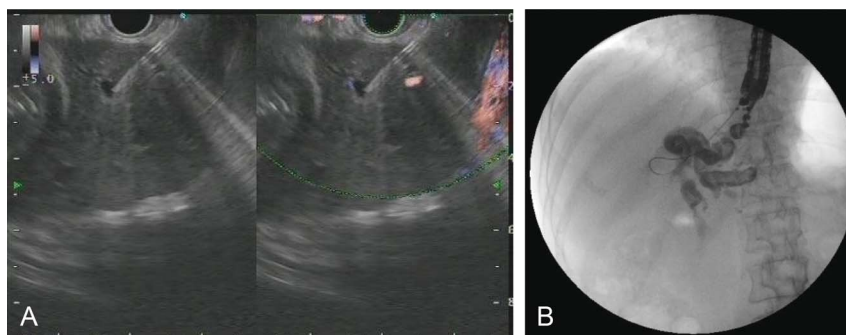


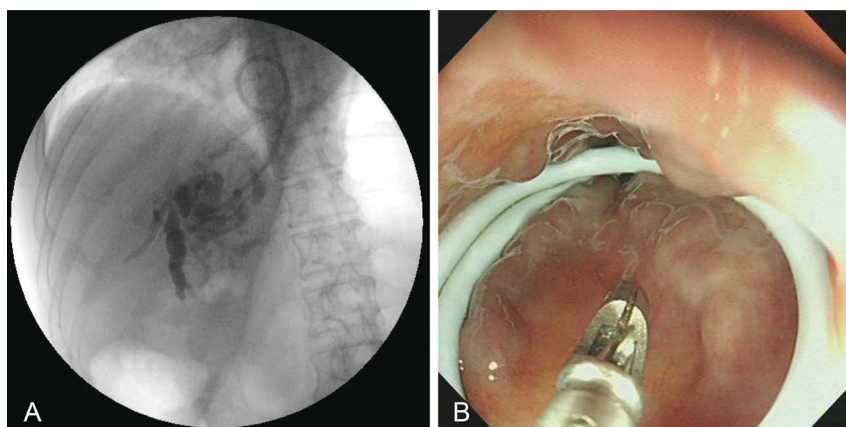
Figure 1. MRI showed dilated upper common bile duct and intrahepatic bile duct. MRI, magnetic resonance imaging.



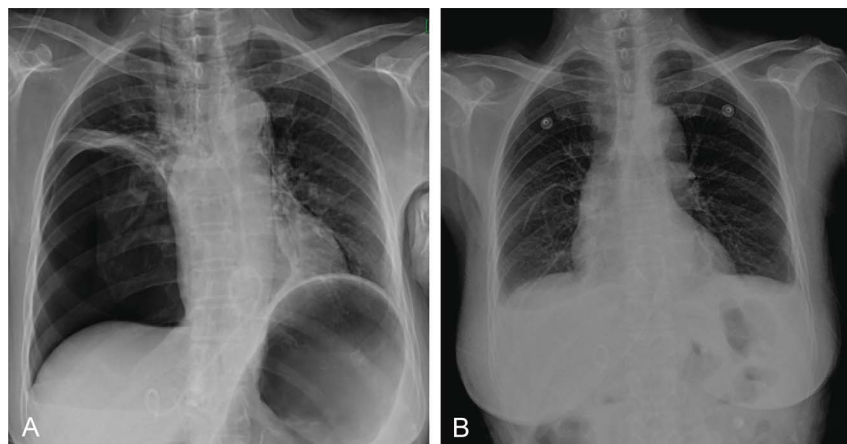
**Figure 2.** Gastroscopy showed the duodenal bulb and descending duodenum was narrow.



**Figure 3.** A, A 19-gauge needle was used to puncture the dilated bile duct in segment 2 of the liver Under EUS guidance. B, Contrast imaging through the puncture needle demonstrated intrahepatic bile duct dilation.



**Figure 4.** A, Nasobiliary tube placement under X-ray fluoroscopy. B, Endoscopic observation revealed the puncture site in the lower esophagus, and the nasobiliary tube was cut with endoscopic scissors.



**Figure 5.** A, Chest X-ray suggested right-sided pneumothorax. B, Follow-up chest x-ray performed 3 days after closed thoracic drainage showed clear lung fields with no evidence of pneumothorax.

### Ethical Approval and Informed Consent

The study was conducted according to the principles and the recommendations of the 2013 Declaration of Helsinki. The study was approved by the Medical Ethics Committee of Union hospital, Tongji Medical College, Huazhong University of Science and Technology (ethical approval number: 2024-0310). We ensured that the patients had not opposed the use of their medical records for research.

### Conflict of Interests

The authors declare that they have no conflict of interest.

### Author Contributions

Guochen Shang and Chaoqun Han collected medical records data and drafted the manuscript; Yu Jin and Jun Liu contributed to data

collection; Zhen Ding and Rong Lin supervised the study and revised the manuscript.

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