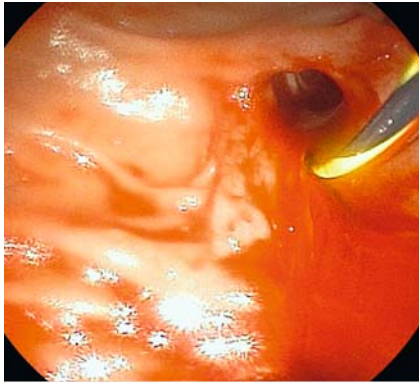
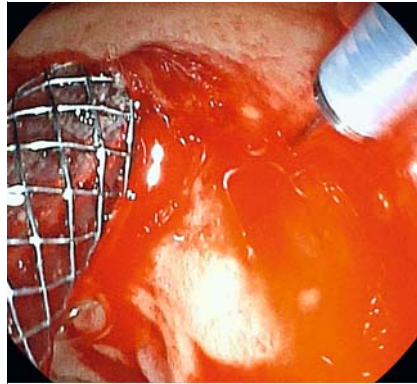


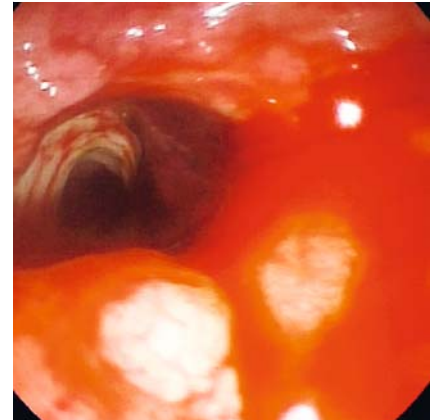
## Intrabiliary argon plasma coagulation hemostasis by direct cholangioscopy for a tricky post-ERCP bleeding



► **Fig. 1** Bleeding after endoscopic retrograde cholangiopancreatography was refractory to diluted epinephrine injection (guidewire cannulation).



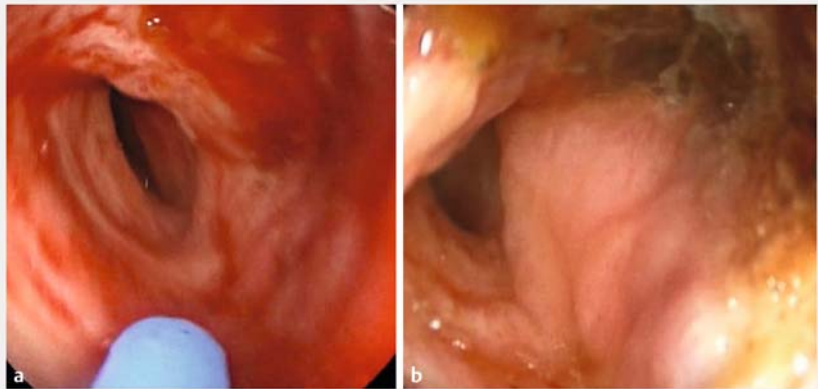
► **Fig. 2** Apposed fully covered metallic stent and fibrin glue injection during the first approach.



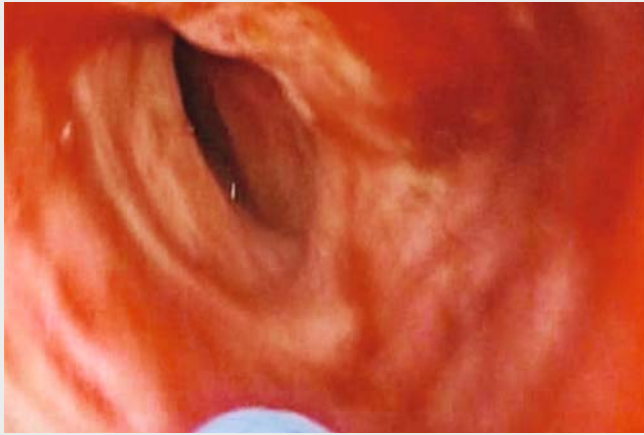
► **Fig. 3** Common bile duct bleeding source (outside view).

An 80-year-old man was admitted to the emergency department with fever, jaundice, and abdominal pain due to common bile duct (CBD) lithiasis. His past medical history revealed chronic renal failure and atrial fibrillation, which was treated with warfarin. Therapy with antibiotics and phytomenadione was promptly started, and international normalized ratio values returned to normal.

Cholangiography showed the CBD dilated up to 18 mm and multiple large stones. Sphincterotomy was performed, followed by papillary pneumatic dilation up to 15 mm and stone extraction, with no residual filling defect at cholangiography.



► **Fig. 4** Direct peroral cholangioscopy. **a** Argon plasma coagulation of visible oozing vessel. **b** Hemostasis.



**▶ Video 1** Argon plasma coagulation of active bleeding vessel in the distal tract of the common bile duct under direct visualization during cholangioscopy.

The following day, the patient presented signs of hypovolemic shock (hemoglobin 6 g/dL) and melena. Prompt transfusion was organized and an urgent ERCP showed oozing bleeding in the papillary region (▶ **Fig. 1**). Diluted epinephrine was injected, but because of persistent active bleeding, a fully covered metal stent, 40×10 mm, was placed. Fibrin glue (Tissucol; Baxter AG, Vienna, Austria) was injected into the papillary area, resulting in complete hemostasis (▶ **Fig. 2**).

After 3 days, another episode of melena and anemia occurred. A further ERCP

was performed, and showed a distally migrated biliary stent and visible oozing bleeding coming from the inside the CBD (▶ **Fig. 3**).

Direct cholangioscopy was performed using a slim gastroscope (EG530NP, 8.5 mm thin; Fujinon, Tokyo, Japan), under carbon dioxide insufflation, and showed an active bleeding vessel in the distal tract of the CBD. Argon plasma coagulation was successfully applied (setting Precise 15–20 W; Erbe, Tübingen, Germany) under direct visualization (▶ **Fig. 4**, ▶ **Video 1**), with no related adverse events.

The patient's general condition and laboratory tests improved until discharge. There were no clinical signs of bleeding at 6-month follow-up.

This case describes the possible challenges in treating post-ERCP biliary bleeding and a new promising simple approach that should be considered as a part of the endoscopist's armamentarium. To our knowledge this is the first described case of hemostatic APC application in CBD under direct visualization [1–3].

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### Competing interests

Andrea Anderloni is a consultant for Boston Scientific.

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