Hemorrhage after laser-cut covered self-expandable metal stent removal

Endoscopic covered self-expandable metal stent (CSEMS) placement is widely used for distal malignant biliary obstruction (MBO) as the stent prevents ingrowth and is easily removed [1,2]. The usefulness of the laser-cut CSEMS (LC-CSEMS) and its endoscopic removal have been reported [3–5]; there have been no previous reports of complications related to LC-CSEMS removal. We here report a case of hemorrhage following LC-CSEMS removal.

An 83-year-old woman was referred for cholangitis. She had undergone endoscopic LC-CSEMS (X-Suit NIR covered biliary metal stent; Olympus Medical Systems, Tokyo, Japan) placement 7 months previously for unresectable pancreatic cancer. Endoscopic retrograde cholangiopancreatography (ERCP) was performed because recurrent biliary obstruction was suspected (▶ Fig. 1; ▶ Video 1). Cholangiography revealed defects suggestive of sludge (▶ Fig. 2). We therefore decided to remove the LC-CSEMS and replace it with a new one.

A snare forceps was used to hold the LC-CSEMS, which was moved toward the papilla by pushing, along with clockwise torsion of the endoscope while adjusting the axis of the bile duct [3]. The initial attempt to pull the LC-CSEMS out was effective; however, the snare subsequently could not be released, with the plan having originally been to release it from the LC-CSEMS and reposition it nearer the papilla (**> Fig. 3a**). Consequently, the LC-CSEMS was instead re-

moved by withdrawing the endoscope. After stent removal, we inserted the endoscope to the papilla and found that a hemorrhage had been induced from the papilla during LC-CSEMS removal (**> Fig. 3 b**). Although biliary cannulation was possible, the hemorrhage disturbed the endoscopic view, so re-insertion of the new LC-CSEMS was performed under fluoroscopic guidance. The LC-CSEMS suffers from minimal stent shortening because of the laser-cut structure; there-



▶ Fig. 1 Endoscopic retrograde cholangiopancreatography findings showing: a the endoscopic appearance of the successfully placed laser-cut covered self-expandable metal stent (LC-CSEMS) for a patient with unresectable pancreatic cancer; b the fluoroscopic appearance of the successfully placed LC-CSEMS.



Video 1 Difficult removal of a laser-cut covered self-expandable metal stent (LC-CSEMS) causing hemorrhage from the papilla that was subsequently controlled by insertion of a replacement LC-CSEMS.

fore, it could be placed easily in an accurate position (**> Fig. 4a**) and the hemorrhage was finally stopped by compression from the LC-CSEMS (**> Fig. 4b**). Although this hemorrhage was induced by LC-CSEMS removal, it was easily stopped after the LC-CSEMS was replaced.

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Competing interests

The authors declare that they have no conflict of interest.



► Fig. 2 Cholangiographic appearance with defects (pink arrows) suggestive of sludge.

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▶ Fig. 3 Endoscopic views showing: a the snare forceps, which could not be released, holding the partially withdrawn laser-cut covered self-expandable metal stent; b hemorrhage that was induced during laser-cut covered self-expandable metal stent removal.



▶ Fig. 4 Endoscopic retrograde cholangiopancreatography findings showing: a the fluoroscopic appearance of the successfully placed accurately positioned laser-cut covered selfexpandable metal stent (LC-CSEMS); b the endoscopic appearance with hemostasis successfully achieved by compression from the LC-CSEMS.

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