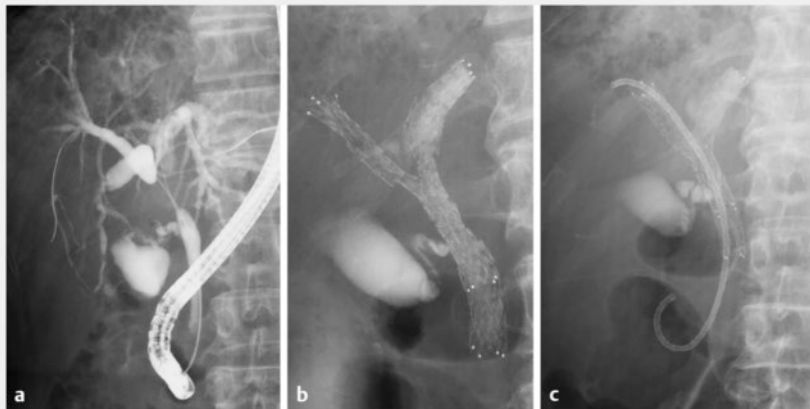
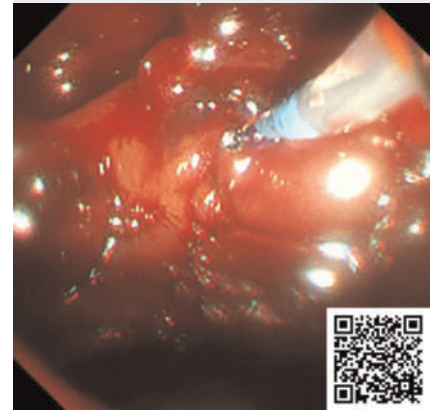


## Covered self-expandable metal stent for hemostasis of ruptured pseudoaneurysm caused by partial stent-in-stent method

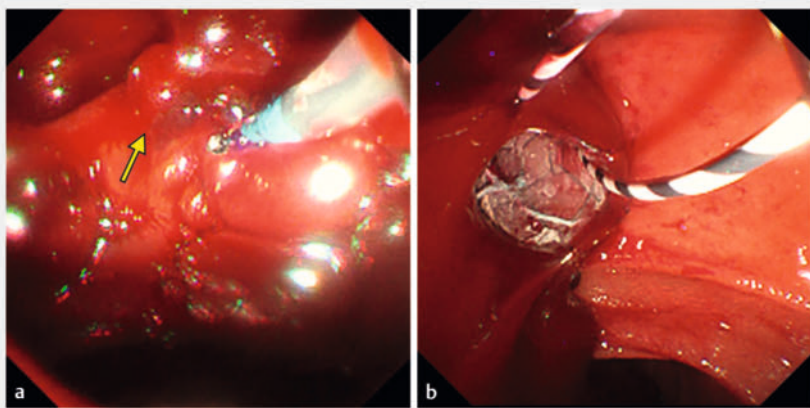
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► **Fig. 1** Endoscopic retrograde cholangiopancreatography images. **a** Hilar biliary obstruction. **b** Self-expandable metal stents (SEMSs) (Zeostent V; Zeon Medical, Inc., Tokyo, Japan) were placed using a partial stent-in-stent method (left: diameter 10 mm, length 6 cm; right: diameter 10 mm, length 8 cm). **c** A plastic stent (7 Fr, length 8 cm, without flap) was placed through the SEMS into the right hepatic duct.



► **Video 1** When the plastic stent was removed, pulsating bleeding occurred. After placement of a covered self-expandable metal stent (CSEMS), hemostasis was successfully achieved. The CSEMS was removed 2 weeks later.



► **Fig. 2** Endoscopy images. **a** Pulsating bleeding from the duodenal papilla (arrow) caused by pseudoaneurysm rupture. **b** After placement of a covered self-expandable metal stent (Niti-S SUPREMO, diameter 10 mm, length 8 cm; Century Medical, Inc., Tokyo, Japan), hemostasis was achieved.

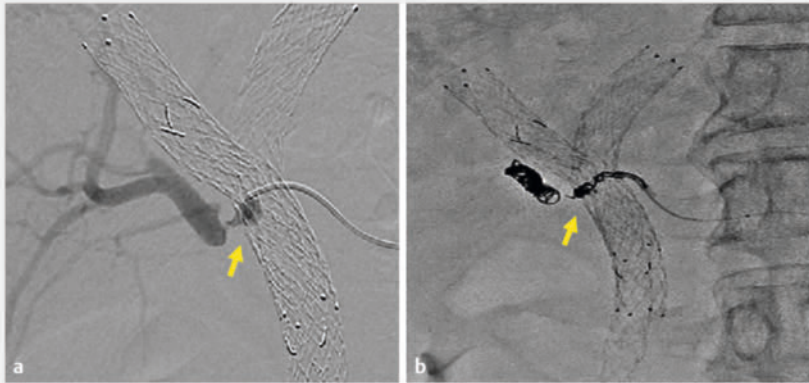
retrograde cholangiopancreatography (ERCP), which revealed hilar biliary obstruction (► **Fig. 1 a**). Bilateral biliary drainage using a PSIS method was planned. Following SEMS deployment into the left hepatic duct, another stent was inserted into the right hepatic duct in a stent-in-stent manner (► **Fig. 1 b**). One month later, cholangitis developed and a plastic stent was placed through the SEMS in the right hepatic duct (► **Fig. 1 c**). Cholangitis developed again after 1 month and ERCP showed blood around the plastic stent; however, when the plastic stent was removed, pulsating bleeding caused loss of view (► **Fig. 2 a**, ► **Video 1**). Hemostasis by CSEMS placement, followed by its removal to prevent obstruction of the left bile duct, was planned.

A CSEMS was inserted through the SEMS in the right hepatic duct and extended from the duct to the papilla. The field of view was secured (► **Fig. 2 b**). Angiography was performed and revealed a pseu-

Placement of a covered self-expandable metal stent (CSEMS) is useful for hemostasis in patients with hemobilia [1,2]. Following SEMS placement with a partial stent-in-stent (PSIS) method, an SEMS is not generally used for hilar bile duct hemostasis as this type of stent may

cause contralateral biliary obstruction. This is the first reported case of pseudoaneurysm rupture caused by PSIS, in which hemostasis was subsequently achieved using a CSEMS.

An 80-year-old man with a hilar cholangiocarcinoma underwent endoscopic



► **Fig. 3** Angiography images. **a** Pseudoaneurysm (arrow) in the right hepatic artery. **b** Coil embolization treatment (arrow) was performed.

doaneurysm of the right hepatic artery involving the SEMS, with no further extravasation from the pseudoaneurysm noted (► **Fig. 3 a**). The angiography findings confirmed that the bleeding was from the pseudoaneurysm and that placement of the CSEMS had successfully achieved hemostasis. The pseudoaneurysm was then treated with coil embolization (► **Fig. 3 b**) and the CSEMS was removed after 2 weeks.

Pseudoaneurysm rupture is a life-threatening condition, with emergency hemostasis necessary as a life-saving procedure. In the present case, primary hemostasis was achieved as planned by use of a CSEMS following a PSIS method.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

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