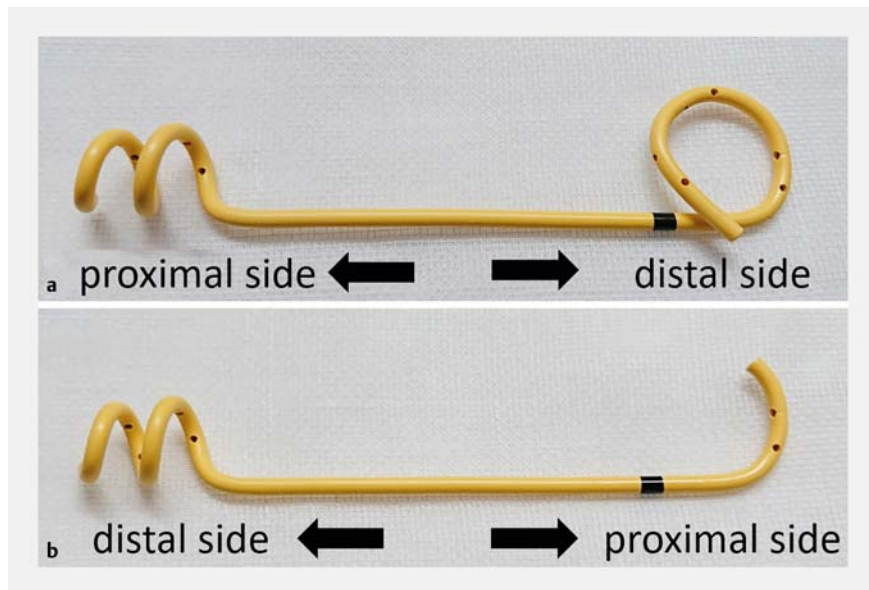


Spiral stent placement for bile leakage after hepatobiliary surgery



► **Fig. 1** Spiral-K (Gadelius Medical K.K., Tokyo, Japan). **a** Originally, the spiral end was placed proximally and the pigtail end was placed distally. **b** We shortened the pigtail end of the stent and placed the stent upside down such that the spiral end was positioned distally.



► **Fig. 2** Endoscopic retrograde cholangiography revealed a stricture and bile leakage at the hepatic hilum.

the ability of the stent to conform to the bile duct postoperatively. To solve this problem, we used a unique plastic stent (Spiral-K, Gadelius Medical K.K., Tokyo, Japan) (► **Fig. 1 a**) placed above the papilla. Originally, the spiral end was placed proximally and the pigtail end was placed distally. We shortened the pigtail end and placed the stent upside down such that the spiral end was positioned distally (► **Fig. 1 b**).

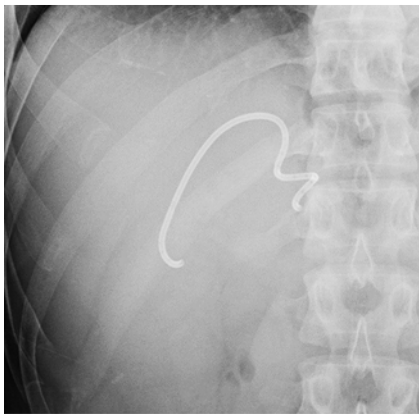
A 35-year-old man was referred to our hospital for bile leakage after a left hepatic lobectomy performed for alveolar echinococcosis. Endoscopic retrograde cholangiography revealed a stricture and bile leakage at the hepatic hilum (► **Fig. 2**). Initially, we placed an ENBD tube (6 Fr) across the stricture; however, the tube was dislocated immediately. Next, we placed a fully covered, intraductal, self-expanding, metal stent (10 × 70 mm); however, the stent had migrated distally 1 month later. At the third treatment attempt, we placed an internal stent (7 Fr, 9 cm) with a distal thread; however, 3 months later, this stent had also migrated deep into the proximal duct (► **Fig. 3**), making removal difficult. Finally, the Spiral-K stent (7 Fr, 20 cm) was placed above the papilla upside



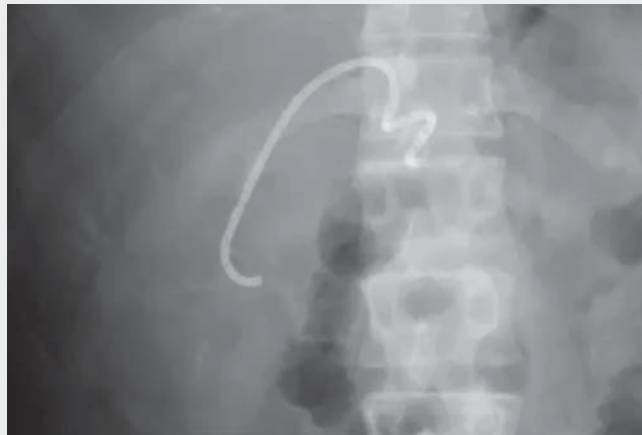
► **Fig. 3** An internal stent (7 Fr, 9 cm) was placed but migrated deep into the proximal duct. **a** Immediately after stent placement; **b** 3 months later.

Endoscopic drainage, especially endoscopic nasobiliary drainage (ENBD) followed by stent placement, is recom-

mended for bile leakage after hepatobiliary surgery [1–3]. However, these stents can sometimes migrate, depending on



► **Fig. 4** The spiral stent placed above the papilla in an upside-down manner.



► **Video 1** Spiral stent placement for bile leakage after hepatobiliary surgery.

down as described above (► **Fig. 4**, ► **Video 1**), to prevent stent migration and allow easy stent exchange. No stent migration had occurred 8 months after placement. The Spiral-K stent was easily removed using grasping forceps and replaced with another stent of the same type.

This is the first report of a suprapapillary spiral stent placed in an upside-down fashion. The distally placed spiral end works as an anchor, preventing migration and allowing easy removal.

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Competing interests

The authors declare that they have no conflict of interest.

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