

Insertion of two overlapping new covered metal stents for closure of a complex biliary leak and description of a safe technique for their removal

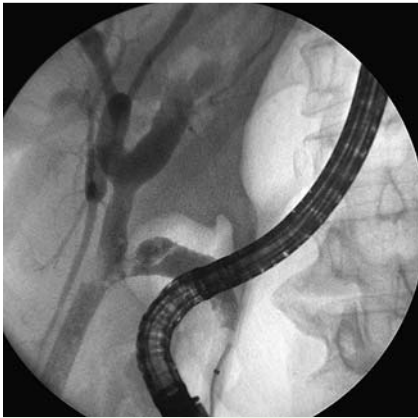


Fig. 1 Cholangiographic image showing a large leak of contrast due to bile duct damage.

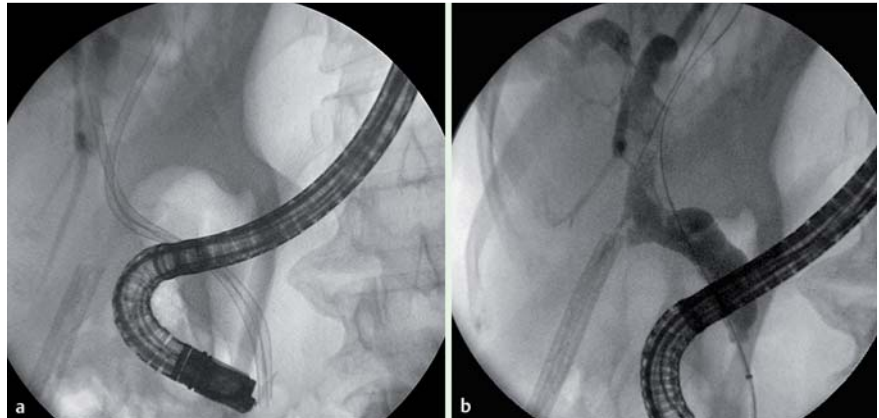


Fig. 2 Cholangiographic images showing: **a** placement of two 10-Fr plastic stents; **b** persistent leakage after removal of the plastic stents.

Recently, the use of partially or fully covered self-expandable metal stents (FCSEMSs) has been described for the treatment of complex bile leaks after laparoscopic or open cholecystectomy [1,2]. A 72-year-old woman developed a bile leak after an open cholecystectomy (● Fig. 1).

An initial attempt at closure with plastic stents was unsuccessful (● Fig. 2).

Therefore, it was decided to use a 10-mm diameter, 8-cm long FCSEMS (WallFlex; Boston Scientific, Natick, Massachusetts, USA), which was successfully placed (● Fig. 3), and the bile output into the external drain decreased.

Unfortunately, 1 week later a large amount of bile reappeared in the external drain. A third endoscopic retrograde cholangiogram (ERC) showed shortening of the stent with the proximal end now below the bile duct defect, and therefore leakage of contrast (● Fig. 4a); therefore, another 8-cm FCSEMS was placed partly inside the first, completely covering the area of damaged bile duct with complete resolution of the leakage (● Fig. 4b).

A follow-up ERC was performed 6 weeks later, and the stents were removed using the following technique. The mesh of the nearest FCSEMS was grasped with a rat-toothed forceps, but the other FCSEMS was sticking within the bile duct. A 10-mm diameter through-the-scope CRE balloon dilator (Boston Scientific) was therefore positioned inside the stents and

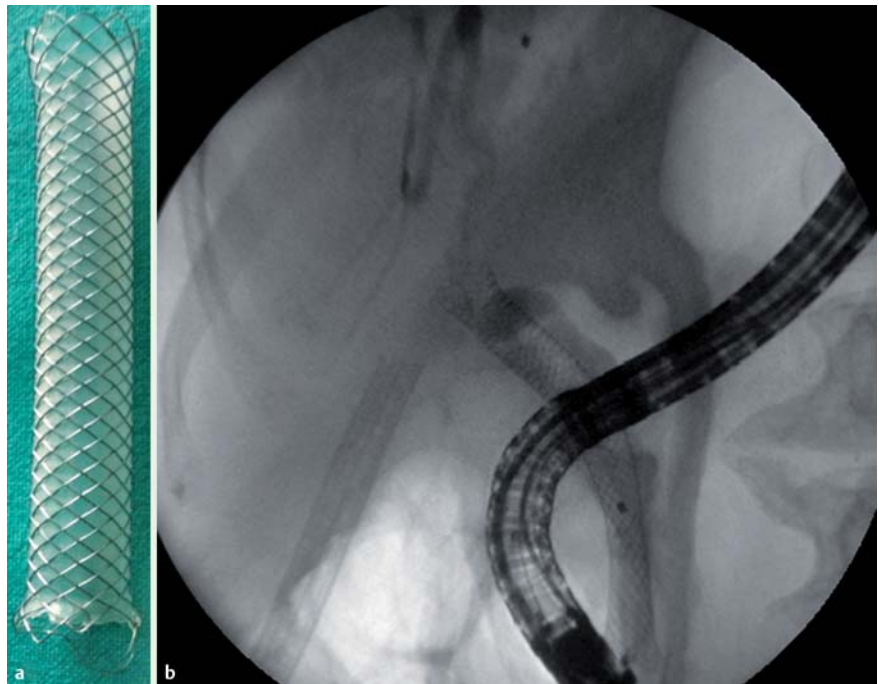


Fig. 3 **a** The WallFlex fully covered self-expandable metal stent (FCSEMS). **b** Radiological image of the FCSEMS placed in the bile duct.

inflated (● Fig. 5a), after which, the stents were easily pulled out of the bile duct and drawn into the gastric cavity (● Fig. 5b). The FCSEMSs were grasped with a forceps (● Fig. 5c) and withdrawn along with the endoscope (● Fig. 5d). Finally, cholangiography confirmed the resolution of the bile leak (● Fig. 6).

To the best of our knowledge, this case is the first reported use of a fully covered

WallFlex stent for closure of a complex biliary leak secondary to open cholecystectomy. In this case, with a large area of damage in the proximal bile duct, we have shown that the placement of two overlapping FCSEMSs is an effective method of lining the bile duct lumen and covering the site of leakage. The technique of inflating a balloon inside a stent to assist its removal has been previously used [3],

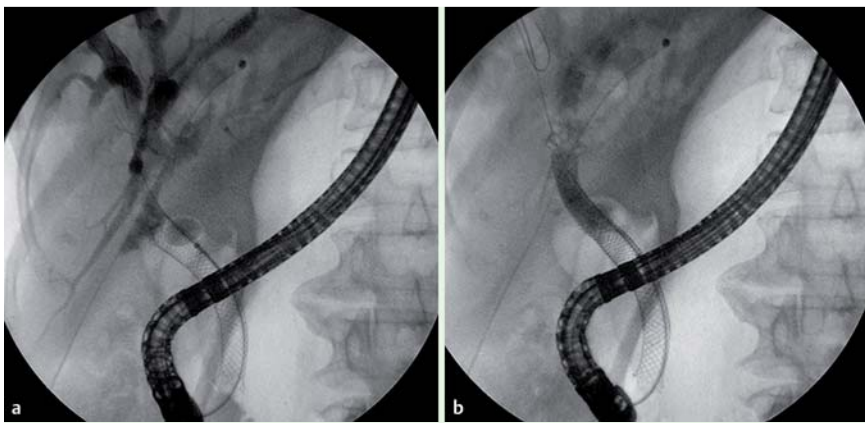


Fig. 4 Cholangiographic images showing: **a** shortening of the fully covered self-expandable metal stent (FCSEMS) with a large leakage of contrast; **b** the second FCSEMS placed partly inside the first.

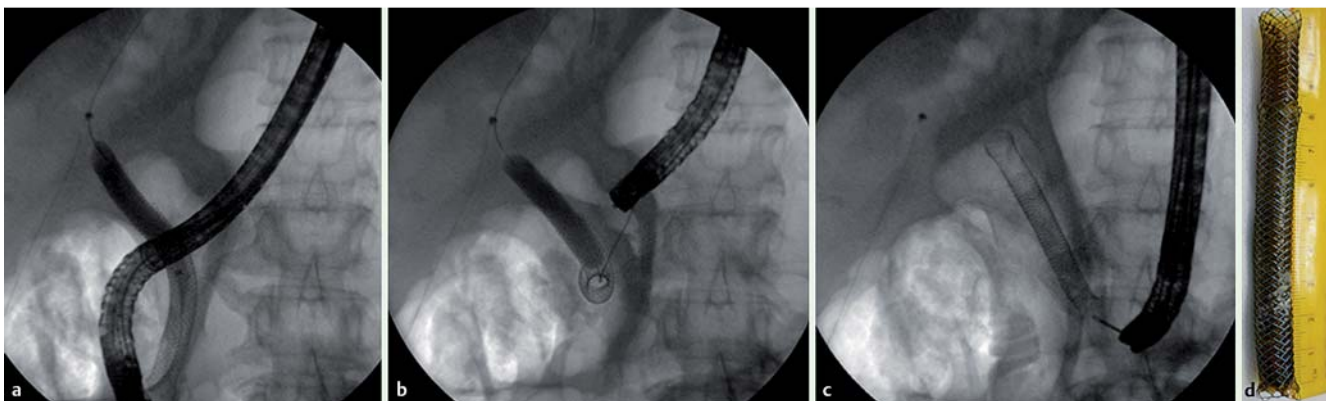


Fig. 5 **a–c** Cholangiographic images showing: **a** the CRE balloon inflated inside the fully covered self-expandable metal stents (FCSEMSs); **b** removal of the stents from the bile duct; **c** the stents finally withdrawn with the rat-tooth forceps. **d** The two FCSEMSs after their removal.

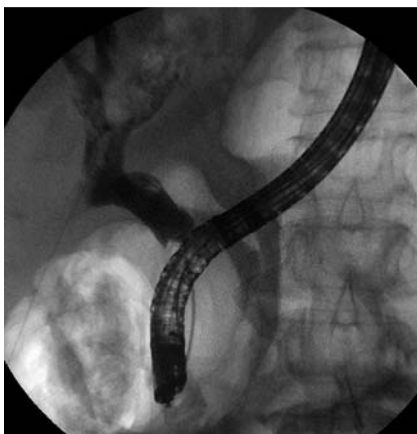


Fig. 6 Cholangiographic image showing resolution of the bile leak.

but this case is also the first report in which the technique has been successfully used for the simultaneous removal of two FCSEMSs, so avoiding the risk of the second stent dislocating during removal.

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Competing interests: None

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Bibliography

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