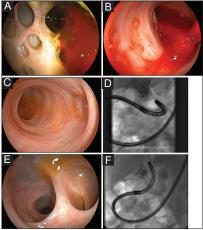
Valuing endoscopic papillary large-balloon dilation and direct cholangioscopy in a "small-stones-in-large-bile-duct" situation

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An 87-year-old patient post-cholecystectomy presented with right upper quadrant pain and mild cholestasis. With a history of endoscopic retrograde cholangiopancreatography (ERCP) with papillotomy and common bile duct dilation (CBD) on ultrasound, the patient underwent repeat ERCP. Despite an intradiverticular localization and diffusely reddened, slightly elevated papillary mucosa (post hoc adenoma excluded) (Fig. 1A), cannulation was uncomplicated, confirming a 20-mm diameter CBD without definitive stones (Fig. 1B). Balloon and 8-wire Dormia basket (FlowerBasket, Olympus) sweeps proved ineffective; however, contrast clearance appeared reduced and the papillary orifice shrunken. Therefore, endoscopic papillary large-balloon dilation up to 13.5 mm was performed (Fig. 1C) for treatment of intradiverticular post-papillotomy stenosis and priming for direct cholangioscopy (DC). The latter might potentially be considered the novel golden standard in bile duct stone detection and/or exclusion, particularly in the presence of diffuse biliary dilation [1,2]. Likewise, immediate stone passage might be induced, as indeed occurred in the presented case after balloon retrieval and luminal suctioning (Fig. 1D). After switching to an ultra-slim upper endoscope (Fujinon EG-530NW, outer diameter 5.9 mm), the large-bore papillary orifice (Fig. 2A) was intubated in a freehand fashion, revealing some fresh blood in the pre-papillary segment (Fig. 2B). After an intensified J maneuver and intermittent epigastric compression to reduce gastric loop formation, with the patient in left lateral position (our standard position in DC candidates), full DC was accomplished and remnant stone disease excluded in the distal (Fig. 2C,D) and the proximal CBD up to the hilum (Fig. 2E,F).

Figure 1 (A) Intradiverticular localization of the diffusely reddened, slightly elevated papilla with a shrunken orifice post-papillotomy (post hoc pathologic exclusion of adenoma). (B) Cholangiogram with a markedly dilated common bile duct and ineffective balloon (not shown) and 8-wire Dormia basket sweeps. (C) Endoscopic papillary large-balloon dilation up to 13.5 mm, (D) resulting in spontaneous passage of several small pigment stones



 $\label{eq:Figure 2} Figure 2 \ (A) Large papillary orifice (\textit{lower right}) before freehand intubation with an ultra-slim upper endoscope. (B) Small amounts of blood in the prepapillary common bile duct (CBD). (C, D) Exclusion of remnant stones in the distal and (E, F) the remaining CBD during scope advancement up to the liver hilum (endoscopic-fluoroscopic juxtapositions, respectively)$

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