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IN THE EXPERT'S FOCUS

# Endoscopic partial sphincterotomy coupled with large balloon papilla dilation – Single stage approach for management of extra-hepatic bile ducts macro-lithiasis☆☆

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**Abstract**
Endoscopic papillary balloon dilation (EPBD) was introduced in the 80 s as an alternative for treatment of biliary lithiasis in order to minimize complications related to biliary endoscopic sphincterotomy (ES) and to preserve sphincter mechanism. However it could not gain wide acceptance because of high incidence of post procedural pancreatitis compared to ES alone. In 2003, endoscopic large balloon papillary dilation (ELPBD) coupled with ES, has been proposed as an alternative to lithotripsy for treatment of giant or difficult calculi of the common bile duct. Since then, several studies have evaluated the efficacy of such approach, however in the absence of clear instructions about indications, technique's standardization, morbidity rate and long-term results this procedure has not yet gained wide use. In this report we describe our technique of partial endoscopic sphincterotomy plus large papillary balloon dilation in the

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treatment of common bile duct and cystic duct macro-lithiasis. According to our clinical experience, we would like to focus on the technical points that have to be respected in order to reduce procedure's complications and to achieve successful clinical results
We conclude that endoscopic partial sphincterotomy plus large papillary balloon dilation seems a promising, effective and safe approach to treat giant extrahepatic biliary calculi, if performed after correct patient selection and under established guidelines.


## Video related to this article

Video related to this article can be found online at http://dx.doi.org/10.1016/j.vjgien.2013.06.003.

## 1. Background

- Extraction of giant or multiple calculi from extra-hepatic duct by standard ERCP achieves limited success, mainly due to technical difficulties. Alternative techniques for removal of bile duct stones not amenable to standard endoscopic procedure are: mechanical lithotripsy, electro-hydraulic lithotripsy, extra-corporeal shock wave lithotripsy or laser cholangioscopy-guided lithotripsy. Unfortunately these techniques often require multiple sessions.
- These redo procedures are usually successful if carried out by an expert endoscopist in high volume center.
- Biliary stenting is considered a useful alternative in very old patients and those with serious co-morbidities. Biliary stenting is mandatory if common bile duct clearance cannot be achieved.
- Sometimes surgery is necessary to definitively achieve bile duct clearance.

## 2. Materials

- Duodenoscope Olympus® TJF 160 VR
- Guide Wired Sphincterotome Autotome® (Rx Boston Scientific®)
- Guide wire Hydrajagwire® 450 cm, 0.0035
- CRE WG® balloon dilation (three different size: 12–15 mm, 15–18 mm; 18–20 mm)
- Manometer Encore26®
- Extraction Balloon Extractor Pro Rx® (Boston Scientific®)

## 3. Endoscopic procedure

- Retrograde Endoscopic Cholangiography confirms a dilated common bile duct (bile duct diameter $\geq$ 12 mm) and presence of macrolithiasis (stones $\geq$ 15 mm).
- Cannulation of the intra-hepatic bile ducts with a guide wire.
- Partial sphincterotomy over the guide wire, defined as mid-incision compared to complete sphincterotomy that is extended until the superior margin of intra-duodenal papillary portion.
- Withdrawal of the sphincterotome leaving behind the guide wire inserted in the intra-hepatic ducts.
- Insertion of large balloon over the guide wire choosing the size in accordance with the size of the bile duct and of the stones.
- Positioning of the balloon in the papilla and low part of bile duct, taking care not to incarcerate the stone between balloon and bile duct wall in order to reduce the risk of perforation of the bile duct by stone impaction during dilation. In order to avoid stone incarceration before inflating the balloon is important to push the stone above the balloon under fluoroscopy control.
- Starting dilation by inflating the balloon gradually, under endoscopy and radiological control, using diluted contrast media. Observe the gradual disappearance of the waist of the balloon and then keep it in place for 30 s (1-1.5 min overall dilation time)
- It is fundamental to maintain a stable position throughout the procedure and to guarantee a proper alignment between the biliary axis and the axis of the balloon in order to avoid the risk of bile duct rupture. Sometimes the right axis is achieved gently pushing forward the scope (few centimeters) as to obtain the long position.
- Avoid this procedure (large papillary dilation) in case of suspected neoplastic stenosis.
- Deflating the balloon without moving it and to withdraw it after it is completely deflated keeping the guide wire in place to facilitate access in case of any complication.
- Check with fluoroscopy if any free air is present in abdomen. Perform the extraction of stone with extraction catheter balloon or dormia basket.

## 4. Discussion

In 1982 papillary dilation with a small diameter balloon was proposed as an alternative to endoscopic sphincterotomy (ES) for stone extraction with the aim to preserve the sphincter function and avoid bleeding [1]. This technique was not widely put into practice because of the high level of pancreatitis related to the procedure compared to the ES alone [2] and for the routinely need of mechanical lithotripsy to achieve complete stone extraction [3]. Current guidelines demonstrated a significant higher incidence of post ERCP pancreatitis (PEP) for EPBD alone compared to ES not recommending this method as an alternative to sphincterotomy in routine ERCP but considering it useful in patients with coagulopathy and altered anatomy [4].