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Review Article

Endoscopic management of benign biliary strictures: Possibility or exercise in futility?

Pierre H. Deprez

Department of Hepato-Gastroenterology, Cliniques universitaires Saint-Luc, Université Catholique de Louvain, Brussels, Belgium

Abstract

Benign biliary strictures for which endoscopic treatment is proposed are mostly related to liver transplantation or chronic pancreatitis (one third of cases each) and, less frequently, to other causes (e. g., cholecystectomy, sphincterotomy). The question of futility of exercise may therefore be of importance before embarking in these techniques. Endoscopic treatment of iatrogenic (post-operative) benign strictures may be considered as the gold standard since 90% of success is achieved with multiple stent placement. In strictures due to chronic pancreatitis, success rates are lower and surgery may be an appropriate alternative, although it may not be futile to propose an endoscopic try, especially when strictures are related to acute pancreatitis, pseudocyst obstruction or any reversible pancreatic cause of obstruction. In sclerosing cholangitis, endoscopic management is also focused on detection of malignancy. It should therefore not be considered as a futile exercise, but indications and aims of endotherapy should be discussed in a multidisciplinary team involving gastroenterologists, radiologists, and surgical specialists.

Key words

Benign biliary strictures, endoscopic treatment, self-expandable metal stents

Background

In endoscopy everything seems possible with appropriate indications and devices. Biliary and benign strictures may therefore represent not only possible but excellent targets for endoscopic treatment. This enthousiasm should however be tempered by the known complications and some caveats or refractory indications.

Approach of biliary strictures always requires a coordinated multidisciplinary approach involving gastroenterologists, radiologists, and surgical specialists. They may be asymptomatic but, if ignored or badly managed they can cause life-threatening complications, such as ascending cholangitis, liver abscess, and secondary biliary cirrhosis. Depending on the nature of the insult, bile duct strictures (biliary strictures) can be single or multiple. Atrophy of the hepatic segment or lobe drained by the involved bile ducts, associated with hypertrophy of the unaffected segments, can occur, especially with chronic high-grade strictures. These changes can eventually progress to secondary biliary cirrhosis and portal hypertension

Although quite uncommon, the exact prevalence of bile duct strictures (biliary strictures) is unknown. One major category of bile duct strictures is postoperative bile duct stricture, which usually occurs as a result of a technical mishap during cholecystectomy, causing bile duct injury. The incidence rate of major bile duct injury is 0.2-0.3% after open cholecystectomy and 0.4-0.6% after a laparoscopic cholecystectomy.

The differential diagnosis includes:

a. Postsurgical [cholecystectomy (open and laparoscopic), hepatectomy, liver transplantation]
b. Chronic pancreatitis
c. Primary sclerosing cholangitis
d. Autoimmune pancreatitis
e. Endoscopic biliary sphincterotomy
f. Bile duct stones
g. Benign tumors

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Address for correspondence:
Prof. Pierre H. Deprez, Department of Gastroenterology, Cliniques Universitaires Saint-luc, Av Hippocrate 10, 1200 Brussels, Belgium.
E-mail: pdeprez@uclouvain.be

Benign biliary strictures for which endoscopic treatment is proposed are mostly related to liver transplantation or chronic pancreatitis (one third of cases each) and, less frequently, to other causes (e. g., cholecystectomy, sphincterotomy); about 85% of these strictures are located at the level of the CBD. Strictures related to chronic pancreatitis are the most difficult to treat, in particular if calcifications are present in the pancreatic head: They recur in approximately one third of patients after temporary insertion of multiple plastic stents simultaneously or of covered SEMSs, and in two thirds of cases after temporary dilation using a single plastic stent.

The question of futility of exercise may therefore be of importance before embarking in these techniques.

Problems May Occur at all steps During Endoscopic Treatment

Endoscopic management usually includes endoscopic biliary sphincterotomy to allow a wider and repeated (if necessary) access to the common bile duct, passage through the stricture, dilation of the stricture and stent placement.[1-13]

Access to the bile duct may be difficult due to the fact that bile flow may be limited by the stricture limiting the expansion and the size of the distal CBD: careful cannulation is therefore recommended.

Passage through the stricture may be complicated in case of multiple strictures in sclerosing cholangitis, angulation of the stricture (after liver transplantation and biliary anastomosis, or after right or left hepatectomy for example). Use of hydrophilic guidewires or new guidewires such as the Dreamwire (Boston Scientific) may be of interest. Specific techniques such as assisting guidewire direction with a balloon catheter, or a sphincterotome or with the Spyglass to visualize the passage or the duct have been described to overcome difficult situations.

In case of complete stop (after biliary surgery or extensive trauma, for example), a combined approach (percutaneous and endoscopic) may be successful. The endoscopist than traverses the stop or bile duct rupture, captures the wire guide that is inserted by the percutaneous way and stenting is performed by retrograde way over the guide wire. Dilation can be performed with reusable Soehendra dilators but is more easily performed with dedicated dilating balloon used at various diameters (6 and 8 mm most often used in the bile ducts). I do prefer to use 4 cm long balloons rather than the short 2 cm to allow a more stable positioning of the balloon.

What are the debated issues in endoscopic management?

The first debate is whether to place a stent or not after biliary dilation in CBP strictures caused by sclerosing cholangitis? My position is to favour short term stent placement (4 weeks) for the following reasons: ERCP in these patients usually includes multiple techniques with sphincterotomy, dilation, brushing, biopsy, sometimes cholangioscopy, IDUS or other techniques that may cause oedema, cholangitis and poor biliary flow. A temporary stent (similarly to temporary stenting in pancreatic endoscopy) may avoid pain and sepsis after ERCP. Moreover stenting may provide a better dilation than single dilation. But literature data is conflicting and several studies have shown the efficacy of dilation without stenting in these patients

What is the best plastic stent placement method?

Several studies have shown that multiple plastic stents are preferable to single stent. The best technique seems to insert initially 1 or 2 stents (7 or 8.5 Fr) and to exchange them every 3-4 months while placing a supplementary stent at each step (with further balloon dilation when necessary). Duration of stenting should be at least 12 months implying 3 stent replacements during treatment. It is the endoscopic technique that provides the highest long-term biliary patency rate (90% for postoperative biliary strictures and 65% for those complicating chronic pancreatitis). Possible stricture recurrences after this treatment are usually successfully retreated by ERCP. Temporary placement of single plastic stents provides poorer patency rates.

Should we prefer uncovered or covered metal stents?

Treatment with uncovered SEMSs is plagued by high long-term morbidity; temporary placement of covered SEMSs is an investigational option that needs to be carefully evaluated by long-term follow-up studies. A recent meta-analysis evaluated in total, 47 studies (1116 patients) on outcome of stent placement in benign strictures.[13] No randomized controlled trials (RCTs), one non-randomized comparative studies and 46 case series were found. Technical success was 98.9% for uncovered self-expandable metal stents (uSEMS), 94.8% for single plastic stents and 94.0% for multiple plastic stents. Overall clinical success rate was highest for placement of multiple plastic stents (94.3%) followed by uSEMS (79.5%) and single plastic stents (59.6%). Complications occurred more frequently with uSEMS (39.5%) compared with single plastic stents (36.0%) and multiple plastic stents (20.3%). The concluded that based on clinical success and risk of complications, placement of multiple plastic stents is currently the best choice.

The rate of immediate resolution for benign biliary strictures after covered SEMS removal (~80%) seems promising. Nevertheless, at short-term follow-up (<2 years), persistent stricture resolution was reported in only 50–80% of patients with benign biliary strictures related to chronic pancreatitis and to orthotopic liver transplant. Very few data are available about the treatment of postoperative biliary strictures with covered SEMSs. Therefore, the use of covered SEMSs to treat benign biliary strictures should be reserved to clinical trials that aim to identify the type of stent and of stricture associated with the greatest long-term benefit from this treatment.

Placement of multiple plastic stents is of course quite time consuming if one wants to correctly place 3 to 4 stents and placement of a single metal stent seems so easy to perform that many endoscopists may be tempted to immediately place these newer stents. Complications are however more frequent: Migration inside and outside the bile duct, obstruction, new stricture at the proximal part of the stent. Optimal duration of stenting is still under study and patients may forget the stent exchange timing

The recently published ESGE guidelines therefore recommend the following: "In patients with benign CBD strictures, we recommend temporary placement of multiple plastic stents provided that the patient consents and are thought likely to be compliant with repeat interventions. The insertion of uncovered biliary SEMSs is strongly discouraged (Recommendation grade A). Covered SEMSs are a promising alternative for selected benign CBD strictures. Because of the risk of fatal septic complications, a recall system should be set up for the care of patients who do not present for ERCP at scheduled dates (Recommendation grade D)."[8]

So is all this an exercise of futility?

Endoscopic treatment of iatrogenic (post-operative) benign strictures may be considered as the gold standard since 90% of success is achieved with multiple stent placement.

In strictures due to chronic pancreatitis, success rates are lower and surgery may be an appropriate alternative, although it may not be futile to propose an endoscopic try, especially when strictures are related to acute pancreatitis, pseudocyst obstruction or any reversible pancreatic cause of obstruction. It sometimes gives time for the patient to understand the toxic role of drinking and smoking and decide to change his daily habits. Endoscopic biliary drainage is sometimes the only solution if non-operable patients or in patients with a high risk of post-operative morbidity and mortality (portal hypertension, cavernoma). But it is known that in patients with chronic pancreatitis and alcohol abuse, compliance with stent exchange is problematic: In two series involving 43 patients, 70% of patients had stent-related complications (fatal in 5% of cases) because they did not present for scheduled stent exchanges. Hepaticojejunostomy remains a valid option for noncompliant patients with alcoholic chronic pancreatitis or if the stricture does not respond to multiple plastic stenting.

In sclerosing cholangitis, endoscopic management is only a small part of the treatment and is also focused on detection of malignancy. It should therefore not be considered as a futile exercise, but indications and aims of endotherapy should be discussed in a multidisciplinary team.

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