Endoscopic insertion of biliary stents in 18 patients with metallic duodenal stents who developed secondary malignant obstructive jaundice

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SUMMARY

Aim — The aim of this work was to evaluate the feasibility of endoscopic insertion of biliary stents in patients with duodenal stents who develop secondary malignant obstructive jaundice.

Patients and methods — The study population included 133 patients with unresectable malignant duodenal obstruction. In 106 patients a biliary stent was inserted before or at the same time as the duodenal stent. Malignant biliary obstruction appeared secondarily in 18 patients; fifteen of these patients already had a biliary stent. We present our experience of biliary stent insertion in these 18 patients with metallic duodenal stents.

Results — Biliary obstruction was successfully alleviated in 17 out of 18 patients (94%) without complication. Insertion of a new biliary stent failed in one patient because the mesh of the duodenal stent passed over the metallic biliary stent already in place. Mean duration of endoscopic insertion was 95 minutes (range: 60 - 180). All patients remained free of biliary complications to death (57 days, range: 30 - 120).

Conclusion — Our report shows that endoscopic insertion of a biliary stent is feasible in patients who have metallic duodenal stents. Technical difficulties exist especially if the mesh of the duodenal stent passes over the papilla.

RÉSUMÉ

Désobstruction biliaire par endoprothèse après la pose d’une prothèse duodénale : rapport de 18 cas

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Objectifs — Décrire la faisabilité de l’insertion endoscopique d’une prothèse biliaire chez des malades porteurs d’une endoprothèse métallique duodénale pour une sténose maligne inopérable.

Méthodes — Cent trente-trois malades avec sténose maligne duodénale, inopérable, étaient traités de manière palliative par insertion endoscopique de prothèses métalliques. Pour 106 de ces malades, une endoprothèse métallique biliaire était également déployée, devant un envahissement cholédocien survenant avant ou au cours de l’épisode de sténose duodénale. Une obstruction biliaire par progression tumorale apparaissait secondairement au cours du suivi chez 18 malades, dont 15 étaient déjà porteurs d’une prothèse cholédocienne. Nous rapportons notre expérience d’insertion endoprothétique biliaire chez des malades porteurs de prothèse métallique duodénale.

Résultats — La reperméabilisation biliaire par prothèse métallique s’avérait possible pour 17 des 18 malades (94 %), sans complication. Le seul échec survenait dans le cas d’une prothèse cholédocienne qui était recouverte par les mailles de l’endoprothèse duodénale. La durée moyenne du geste endoscopique était de 95 minutes (extrêmes : 60 - 180 minutes). Aucune récidive ictérique ne survenait jusqu’au décès des malades (57 jours, extrêmes : 30 - 120 jours).

Conclusion — Notre expérience démontre la faisabilité de la désobstruction endoscopique biliaire après insertion d’une prothèse duodénale. Néanmoins, il ne faut pas sous estimer la difficulté technique due au recouvrement papillaire par les mailles métalliques de l’endoprothèse duodénale.

Endoscopic insertion of self-expandable metallic enteral stents (either duodenal or gastro-duodenal) has been shown to be a reliable and reproducible method for palliation of unresectable malignant upper gastrointestinal obstruction [1-4]. Most patients develop duodenal obstruction secondary to growth of a malignant tumor head of the pancreas. Prior palliation with a biliary stent inserted after a inaugural episode of jaundice is common. In the event of concomitant obstruction of the common bile duct and the duodenum, it is recommended to insert the biliary stent first, either using a first-intention metallic stent or by replacing a former plastic stent, then to proceed with insertion of the duodenal stent during the same endoscopic procedure [1-5]. Occasionally however, biliary obstruction is secondary, developing in patients whose survival has been prolonged with increasingly effective treatment of the gastrointestinal cancer. We report our experience with endoscopic insertion of a new metallic biliary stent in patients who already have a duodenal stent.

Methods

One hundred thirty-three consecutive patients were seen from June 1997 to December 2003 for symptomatic duodenal obstruction due to an unresectable malignant tumor (pancreatic cancer; 75%). Curative surgery not being a valid option, endoscopic palliation using one or more self-expandable metallic duodenal stents was proposed after a collegial discussion between the referring gastroenterologist and the university oncologists and surgeons. Patients and/or their family were given appropriate information and patients provided their informed consent for endoscopic treatment.
Various models of non-coated duodenal endoprostheses were used. Diameters ranged from 18 to 22 mm with lengths from 6 to 9 cm. For the initial patients (up to March 1998), we used Schneider stents (Bülach, Switzerland). We then switched to Enteral Wallstent® (Boston Scientific, Watertown, MA). During the same endoscopic procedure, we inserted a metallic biliary Wallsten® (Boston Scientific, Watertown, MA) in 84 patients who had concomitant biliary obstruction due to tumor progression. For 22 other patients, a formerly inserted plastic biliary stent was removed and replaced with a metallic stent before insertion of the duodenal stent. This precaution was necessary because insertion of a duodenal stent may cover the papillary orifice and prevent later replacement of a plastic biliary stent in the event of secondary obstruction.

Eighteen patients (11 men and 7 women, mean age 72 years; range: 60-83) were subsequently hospitalized after the development of secondary pruriginous jaundice or cholangitis; mean time after the prior endoscopic treatment was 56 days (range: 25-280). Endoscopic cannulation of the biliary ducts was undertaken. Various problems were encountered and for the purpose of the present study, these 18 patients were divided into four categories (Figures 1 and 2) by order of increasing difficulty. Group I included three patients who already had a biliary stent below the duodenal stent. Group II was composed of two patients with a duodenal prosthesis above the papilla which had not been cannulated due to the lack of jaundice or cholestasis. In the eleven patients in Group III the mesh of the duodenal stent passed over a metallic biliary stent. Group IV included two patients without a biliary stent whose duodenal stent passed over the papilla. An endoscopic procedure was attempted under general anesthesia (propofol) using Olympus duodenoscopes TJF 140 and JF 140R (Tokyo, Japan). Selective biliary cannulation was achieved with a triple-lumen Tritome® spincterotome (Cook, Winston-Salem, NC) or a single-lumen Contour® catheter (Boston Scientific, Watertown, MA) using a rigid guidewire with a hydrophilic tip (Jag Wire® Boston Scientific, Watertown, MA, or Metro II® Cook, Winston-Salem NC). A 6-mm hydraulic dilatation balloon (Boston Scientific, Watertown, MA) was used as needed to...
widened the metallic mesh of the duodenal stents before attempting to insert the new biliary Wallstent® (Boston Scientific, Watertown, MA) [6]. During the last two months of the present study, we also used argon plasma (80 W, 1 L/mn) in an attempt to section the metallic mesh of duodenal stents covering biliary stents and facilitate insertion of a new biliary stent [7]. Patients were followed regularly at monthly consultations. Mean survival was 57 days (range: 30-120) after the revision procedure.

**Results**

The duodenal or gastroduodenal stent was patent in all patients; thus the duodenoscope could be inserted without prior dilatation. The techniques used to remove the biliary obstruction are presented in Table I according to patient groups. The selective biliary cannulation was achieved in the five patients in groups I and II using a hydrophilic guidewire in a single-lumen catheter or a triple-lumen sphincterotome. Expansion of the biliary stent was uneventful in these patients. In order to facilitate insertion of the biliary stent through the mesh of the duodenal stent in the thirteen difficult cases (patients in groups III and IV), the metallic mesh of the duodenal stent covering the papilla was spread apart by erection of the sphincterotome, or in three patients by balloon dilatation, after insertion of the guidewire into the common bile duct (figure 3). For one of the patients in group III, in order to facilitate progression of a new biliary stent into the lumen of the biliary stent already in place, argon plasma had to be used to section the metallic mesh of the duodenal prosthesis covering the initial biliary stent (without immediate complications). Despite these techniques, insertion of the metallic biliary stent was successful in only twelve of these thirteen patients (10/11 in group III and 2/2 in group IV). The one failure occurred because the metallic mesh of the duodenal stent prevented progression of the new biliary stent. The guidewire was successfully inserted into the main bile duct, but dilatation of the balloon and erection of the sphincterotome both failed to open the mesh. This patient underwent a second procedure for radio-guided percutaneous insertion of a metallic stent which was successful.

Mean duration of the endoscopic procedure was 95 minutes (range: 60-120). None of the patients developed recurrent jaundice and all were followed to death. There were no complications directly related to the endoscopic procedure. None of the patients developed duodenal obstruction.

**Discussion**

Our experience demonstrates the feasibility and reproducibility of endoscopic treatment of biliary obstruction in patients with a metallic duodenal or gastroduodenal stent already in place. The rate of success achieved by two senior gastroentro-
problems when inserting the biliary stent in group III and IV patients. But compared with the Enteral Wallstent®, the wider mesh stents have lesser expansion force and leave more room for tumor invasion.

It appears advisable, when anatomically possible, to avoid positioning the duodenal stent over the papilla. In this way, endoscopic palliation can still be performed in the event of secondary biliary obstruction. Consequently, a multidisciplinary discussion, where the possible need for future biliary procedures is examined considering the type of tumor involved and its potential for progression, is mandatory before undertaking endoscopic insertion of a duodenal endoprosthesis. We have also found it important to favor the use of a metallic biliary stent in patients in a palliative situation rather than using a plastic stent early in the disease course. This promotes easier repermeabilization and also facilitates repeat procedures when needed.

An alternative to endoscopic palliation of malignant biliary obstruction in patients with a duodenal stent is to use the percutaneous radiological approach. Experienced teams have reported success rates of nearly 90% [14, 15]. The currently used radiological techniques are well described and documented but to our knowledge remain to be validated for this precise indication. This is probably because the situation of biliary obstruction in patients with a duodenal stent is rather exceptional. Despite the lack of data from a randomized trial comparing percutaneous treatment versus retrograde endoscopy, the rates of secondary prosthetic obstruction and revision procedures appear to be similar [15]. The presence of tumor obstruction high in the biliary tree (supr hilar and/or intrahepatic obstruction) creates more difficult problems for the retrograde approach. The percutaneous radiological method may be preferred here. Nevertheless, in our experience, this type of obstruction (generally due to cholangiocarcinoma) is rarely the cause of the clinical presentation studied here (combined duodenal and biliary obstruction) which is typically encountered in patients with cancer of the pancreatic head. Furthermore, percutaneous transhepatic insertion of a metallic biliary stent can lead to complications, such as hemobilia, bleeding duodenal ulceration, or perforation [15-17]. If the stent is too long, it can enter the duodenal lumen and damage the contralateral mucosa. However, if the duodenal mesh covers the papilla, it can block the radiologically inserted stent and prevent this type of complication.
In conclusion, our work demonstrates that interventional endoscopy, in experimented hands, is a reproducible method for palliation of malignant biliary obstruction despite the presence of a duodenal stent. This technique should be re-evaluated in patients with the new wider meshed metallic gastroduodenal stents. The therapeutic choice between the radiological or endoscopic approach in patients with a duodenal stent who develop jaundice depends on the technical possibilities and the experience and skill of each team.

REFERENCES