A New Technique to Assist in Difficult Bile Duct Cannulation at the Time of Endoscopic Retrograde Cholangiopancreatography

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ABSTRACT

Background and Objectives: At the time of endoscopic retrograde cholangiopancreatography, deep cannulation of the bile duct is a prerequisite to be able to provide endoscopic therapy. We describe a simple technique to assist in difficult bile duct cannulation.

Methods: If the pancreatic duct is easily entered but the bile duct cannot be accessed, a guidewire is advanced into the pancreatic duct, and the cannulating catheter is removed leaving the tip of the wire in the mid pancreatic duct. Alongside the pancreatic wire, a catheter, preloaded with a second wire, is advanced via the channel of the endoscope. With the first wire in the pancreatic duct, the second wire is advanced above it in the anticipated bile duct axis.

Results: We have used this technique in 12 cases and succeeded in 10. No complications occurred.

Discussion: Inserting a pancreatic wire can assist in bile duct cannulation, by straightening and stabilizing the papilla. The use of this new technique can reduce the need for precut sphincterotomy, with its inherent increased risks of pancreatitis, bleeding, and perforation. The approach proposed by us can assist in any difficult bile duct cannulation, but it can be particularly useful when dealing with a papilla that is very prominent with a tortuous intraduodenal segment or a papilla located in a duodenal diverticulum.

Key Words: Endoscopy, Endoscopic retrograde cholangiopancreatography, Bile duct cannulation, ERCP.

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) was first described by McCune and coworkers in 1968 as a purely diagnostic procedure. Over the following years, the therapeutic applications (eg, sphincterotomy, stent placement, stone extraction) have become more important than purely diagnostic ERCP. Furthermore, risks exist in performing a diagnostic ERCP without being able to provide appropriate endoscopic therapy. For example, in the presence of a biliary obstruction, injecting contrast into the biliary tree without immediately draining the obstructed duct can lead to severe cholangitis and sepsis.

Selective deep cannulation of the bile duct is the essential first step and probably most difficult part in providing any ERCP-based endoscopic therapy. Most endoscopists find deep cannulation of the pancreatic duct (PD) significantly easier to achieve than deep cannulation of the common bile duct (CBD). Even in the best of hands, cannulation of CBD can prove to be a formidable challenge. We describe a new, simple technique to assist in deep selective bile duct cannulation.

METHODS

With the patient under conscious sedation, endoscopy was performed with a therapeutic 4.2-mm channel side-viewing video duodenoscope (TJF-130 or TJF-160, Olympus America, Inc., Melville, NY). If the PD was easily entered, but the CBD could not be accessed, the PD was deeply cannulated in a standard fashion by using a triple lumen cannulating catheter (Tandem, Microvasive Endoscopy, Boston Scientific Corp., Natick, MA) preloaded with a flexible tip 0.035” guidewire (Jagwire, Microvasive Endoscopy, Boston Scientific Corp., Natick, MA). The wire was then advanced into the PD, and the cannulating catheter was removed, leaving the tip of the wire in the mid PD. Alongside the pancreatic wire, a papillotome (Tri-tome, Wilson-Cook Medical Inc., Winston-Salem, NC) or triple lumen catheter, preloaded with a second soft tip wire, was advanced via the channel of the endoscope. Once the papillotome/catheter was in the duodenum, the assistant advanced the second wire to protrude about
6mm to 10mm from the tip of the cannulating device. With the first wire in the PD, the second wire was advanced above it in the anticipated CBD axis (usually towards 11 o’clock). The use of the papillotome allowed us to change the angle of approach by using the bowing action of the device. We also used the fluoroscopic image to orient the second wire so that it is between the PD wire and the duodenal lumen as the bile duct is more laterally located than is the PD. (Figures 1 and 2). Advancing the second wire into the CBD was usually done without difficulty, because the wire in the pancreatic duct straightens and stabilizes the papilla.

In our unit, in an attempt to capture all procedure-related complications (eg, pancreatitis, cholangitis, perforation), patients are prospectively evaluated at 3 time points—first, at the time of completion of ERCP, second at the time of discharge of the patient from our recovery area, and finally the day after the procedure at which time all patients are contacted by phone by our charge nurse. If any complications are detected, they are recorded in a complication log book.

RESULTS

We have attempted the 2-wire technique to obtain deep cannulation of the bile duct in 12 patients. All procedures were done on an outpatient basis. The new method was used after attempts to cannulate the CBD with the “standard technique” had failed. We succeeded in gaining deep access to the CBD in 10 patients. In the remaining 2 patients, the bile duct could not be cannulated and was only entered after precut needle knife biliary sphincterotomy.

No complications occurred after the procedures. The 10 patients in whom the new method was successful were discharged to home from our recovery area after 2 hours of postprocedural monitoring. The 2 patients who underwent precut needle knife biliary sphincterotomy were admitted for observation and were discharged from the hospital ward the following day.

DISCUSSION

We describe a very simple and safe technique to assist in difficult bile duct cannulation. A number of methods have been described to assist in obtaining deep access to the CBD. The standard approach is to initiate cannulation attempts with a standard ERCP catheter. The next step usually is to use flexible wire through the catheter and, if
that fails, to use a papillotome as a cannulation device. Advancements in imaging technology (computed tomography, endoscopic ultrasound, and magnetic resonance cholangiopancreatography) had significantly decreased the role of diagnostic ERCP. Since the majority of ERCPs today are therapeutic, some experts propose initiating cannulation attempts with a papillotome preloaded with wire in anticipation that sphincterotomy will be needed in the majority of the cases. Even with the use of these techniques, occasionally the bile duct may not be deeply cannulated.

What do we do if the standard techniques of obtaining CBD access fail? If the indications for ERCP remain strong, precut sphincterotomy is usually the next step. A number of precut sphincterotomy techniques have been described. These include:

1. initiating an incision from within the common channel of the papilla with a “no nose” traction sphincterotome or needle knife sphincterotome,
2. initiating an incision above the ampullary orifice with needle knife sphincterotome (the so-called “fistulotomy” technique), and even,
3. initiating the cut from within the pancreatic portion of the ampulla. It has been well documented that precut sphincterotomy carries a higher rate of complications than does standard sphincterotomy. For that reason, it is reserved for use by experts in high-risk patients with a strong indication for sphincterotomy.
4. Fogel et al have shown a decreased incidence of post-ERCP pancreatitis with the use of a temporary PD stent placed prior to performing biliary precut needle knife sphincterotomy. In an effort to reduce the necessity for needle knife sphincterotomy, Parsons et al used placement of a PD stent to facilitate CBD cannulation. These authors describe 32 patients in whom deep bile duct access could not be initially obtained. In anticipation of needle knife biliary sphincterotomy, a PD stent was placed. Prior to attempting needle knife sphincterotomy, an ultratapered catheter was advanced along side the PD stent to achieve CBD access. This technique succeeded in only 50% of the cases. The patients who failed underwent standard needle knife sphincterotomy over the PD stent.

The technique proposed by us can assist in any difficult CBD cannulation and can preclude the need for the inherently riskier precut needle knife sphincterotomy. We have found the method proposed by us to be particularly useful in the following situations:

1. very prominent intraduodenal portion of the ampulla. In this case, the wire in the PD stabilizes and straightens the papilla. We find the 2- wire technique easier to perform as compared with trying to cannulate beside a previously placed PD stent. The stent may almost completely occlude the ampullary opening and make it difficult even for a tapered cannula or wire to engage the biliary orifice. One can speculate that that is the reason Parsons et al had such a low cannulation rate of 50%.
2. ampulla located inside or on the edge of a duodenal diverticulum. In this case, placement of PD wire brings the ampullary opening face on, thus greatly facilitating biliary cannulation.
3. a situation in which standard or precut biliary sphincterotomy is relatively or absolutely contraindicated (eg, severe coagulopathy). By using the technique proposed by us, one can avoid doing sphincterotomy in patients with coagulopathy. Even if severe coagulopathy is present, endoscopic therapy can still be delivered, for example, by placing a stent via the native papilla or extracting stones after balloon dilation of the sphincteric muscle.
4. pancreatic sphincter hypertension documented by manometry. In such cases, placing a PD stent is usually recommended to decrease the incidence of post-ERCP pancreatitis. If deep cannulation of the PD is achieved, one can save time and leave a wire in the PD and then proceed with biliary sphincterotomy with the PD wire still in place. The PD wire then can be used to place a PD stent. By using this technique, one can avoid the occasional failure to cannulate the PD after biliary sphincterotomy has been performed.

CONCLUSION

We describe a new, very simple technique that can greatly assist in difficult bile duct cannulation. The practicing surgeon endoscopist can easily adopt this, because it is simple and no special devices or additional training is needed. The method described by us appears safer than precut needle knife sphincterotomy, but a face-to-face comparison is needed to validate this hypothesis.

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