Precut papillotomy using a needle knife: experience in 100 patients with malignant obstructive jaundice

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Background: Precut papillotomy enhances the success of selective bile duct cannulation. Doubts have been raised about the relative safety of the procedure. This study was undertaken to assess the success rate and complications of precut papillotomy using a needle knife. Methods: 100 consecutive patients undergoing precut papillotomy for biliary endoprosthesis placement were studied. A needle knife was used in those patients after bile duct cannulation was not successful using other techniques. The success rate, complications and mortality were determined. Results: Selective bile duct cannulation was achieved in 65 patients. There were six complications: bleeding (3), pancreatitis (2), and perforation (1). One patient died following duodenal perforation. The success rate for endoprosthesis placement was increased by 14.2% following precut papillotomy. Conclusions: Precut papillotomy enhances the success of selective bile duct cannulation, with complication rates similar to standard papillotomy. [Indian J Gastroenterol 1997; 16: 52-53]

Key words: Bile duct carcinoma; cholangiography, endoscopic retrograde; pancreas carcinoma, endoprosthesis

Endoscopic placement of biliary endoprosthesis is the palliative procedure of choice for obstructive jaundice due to unresectable bile duct tumors. The most common cause of failure of inserting endoprosthesis is inability to selectively cannulate the bile duct. Precut papillotomy assists in gaining selective access to the bile duct. Concern has been raised about the safety of this technique because several studies have reported higher rate of complications like bleeding, perforation and pancreatitis.

In this study we have analyzed the success rate and complications due to precut papillotomy in 100 consecutive patients undergoing this procedure.

Methods

From January 1991 to May 1996, 444 patients with unresectable tumors involving the biliary tree were referred to our department for endoscopic palliation of obstructive jaundice. ERCP was done after obtaining informed consent, using side-viewing endoscopes JF-1T10 and TJF-20 (Olympus Corporation, Tokyo, Japan). Cannulation was attempted successively with a ball-tipped cannula (HKPC-1, Wilson Cook, USA), a glow-tip catheter (GP-IT, Wilson Cook, USA), a glide wire (Terumo, Japan) or tracer wire (Wilson-Cook, USA). Precut papillotomy was done if selective bile duct cannulation was not possible within 15-20 minutes. The papillotomy was done using a needle knife (HKPC-1, Wilson-Cook, USA), by endoscopists with individual experience of more than 300 ERCP procedures (VDD, VSS, KMM).

After proper positioning of the endoscope the exposed wire of the needle knife was introduced into the papillary opening and the papilla was cut in the direction of the bile duct (11 o'clock to 1 o'clock position). The papilla was cut in layers till the mucosa of the bile duct was exposed. The length of the cut was usually 5 mm. We used short bursts of current (cut-to-coagulation current ratio 75:25). The direction of the cut was controlled by the elevator channel and the right-left control of the endoscope.

An attempt was made to cannulate the bile duct after the cut was deemed to be sufficient, as demonstrated by the typical spreading effect after cutting the sphincter, presence of pink bile duct mucosa, or presence of bile. In patients where these parameters were not visualized, the cut was stopped when it reached the horizontal fold and was about 5 mm deep as indicated by the length of the exposed wire. To avoid submucosal injection, no attempt was made to inject contrast medium unless a free cannulation was achieved.

If cannulation did not succeed, the patient was recalled after 72 hours and cannulation attempted again. After the procedure the patient was kept in hospital for 24 hours for observation. The patient was then asked to report a week later to assess the success of endoprosthesis placement.

Success of precut papillotomy was defined as ability to selectively cannulate the bile duct. Pancreatitis was defined as abdominal pain with elevation of serum amylase levels above five times normal. 24 hours after the procedure. Bleeding was defined as persistent oozing for several minutes after papillotomy, and was considered severe if the patient had hematemia, shock, or required blood transfusions due to fall in hematocrit.

Results

Precut papillotomy was required in 100 of 444 patients (22.4%). On ERCP, 68 of them had proximal and 32 distal bile duct stricture. Twenty six patients had gall bladder cancer; the presence of anomalous pancreatico-biliary ductal union in this group was not analyzed.

Selective bile duct cannulation was possible in 65 pa-
Patients (36 in one attempt, 27 in two attempts, and 2 in three attempts). The procedure had to be stopped in eight patients because of submucous injection. Precut papillotomy resulted in placement of 63 more endoprostheses, thus improving the overall success rate by 14.2%. In two patients the guide wire could not be positioned across the stricture after free cannulation.

Selective cannulation could be achieved in 26 of the first 50 patients and 39 of the next 50 patients, thus indicating a learning curve. There were 6 complications, all of which occurred during the first 50 papillotomies; these included bleeding (3), pancreatitis (2), and perforation (1). The patient with perforation could not be salvaged. The rest of the patients were managed conservatively with success. One patient with bleeding required transfusion of three units of blood.

Discussion

Even in expert hands, selective bile duct cannulation is not possible in 10%-20% of patients. This may be because of acute angulation in the terminal bile duct or anatomical derangements due to presence of a tumor or diverticulum. Strategies employed in these difficult cases include using a different catheter, a glide wire or a tracer wire, or a sphincterotomy.4

Precut papillotomy cuts the sphincter complex, thus helping not only selective biliary cannulation but also passage of other accessories like biliary dilators. Two types of sphincterotomes are commonly employed for this purpose: the needle knife and precut sphincterotome. The latter is an alteration of the standard sphincterotome, with a shorter length wire coming out right from the tip of the sphincterotome. Both the sphincterotomes essentially slit open the bile duct opening by cutting through a part of the sphincter complex. There are no comparative trials assessing the two sphincterotomes and the choice is based on individual preference. The needle knife is preferred by many endoscopists, and a majority of the published literature concerns this sphincterotomy.

We had to resort to precut papillotomy in 22% of our patients. Huibregtse et al.5 reported a 19% frequency of precut papillotomy while Sherman et al.6 reported a 15% frequency. The higher frequency in our study is probably because all our patients had malignant obstructive jaundice with consequent difficulty in proper orientation of papilla.

Our success rate of 65% is lower than the 91% reported by Huibregtse et al.5 and 77% reported by Dowsett et al.2 This is because our results also include the learning period when the success rate was quite low (78% in the latter 50 procedures). It has been observed that beginners cut more to the left of the sphincter, thus increasing the chances of submucous injection and subsequent failure.6

The higher complication rate reported by some authors has resulted in concern regarding the safety of this technique. The length and the direction of the cut may be difficult to control and false passages and submucous injection can result if the cut is to the right or the left of the sphincter. Our complication rate (6%) compares favorably with those of others (2.6%-20%).3,4-7 There were no complications in the last 50 patients in our study.

Our results as well as those of the other groups underscore the importance of a second attempt in case selective cannulation fails during the first attempt. Huibregtse et al.5 could succeed in only 58% of patients in the first attempt.

Our cannulation success was enhanced by 14.2% following precut papillotomy. Dowsett et al.2 could enhance their success rate by 18.2%. Thus precut papillotomy is an effective technique with complication rates comparable to standard papillotomy.

In view of the high complication rates reported by several authors, we recommend needle knife papillotomy only by persons experienced in ERCP and sphincterotomy, and only when selective cannulation cannot be achieved by other methods. Care should be taken not to inject contrast medium till free selective cannulation is achieved, and a second attempt is worthwhile if cannulation is not achieved during the first attempt.

References


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