

RAPID COMMUNICATION

Comparison of early pre-cutting vs standard technique for biliary cannulation in endoscopic retrograde cholangiopancreatography: A personal experience

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Abstract

AIM: To compare the results and complications of early pre-cutting technique with standard technique.

METHODS: From January 2003 to December 2004, a total of 416 consecutive therapeutic biliary ERCP procedures were performed by one endoscopist (T.A.). Data were retrospectively collected according to procedure indication and results. Of these, 293 procedures (70.4%) were done with standard technique (group A) and 123 procedures (29.6%) with early pre-cutting technique in case of difficult cannulation (group B). The results and complications of ERCP were compared.

RESULTS: Success rate of first attempt cannulation was 98.0% in group A and 87.8% in group B. The overall incidence of post-ERCP pancreatitis, hemorrhage, perforation and cholangitis was 0%, 0.2%, 0.5% and 0.5%, respectively. Morbidity rate was not significantly different. No procedure-related mortality was occurred.

CONCLUSION: For an experienced hand, the early pre-cutting technique for biliary cannulation is safe and effective as standard technique.

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Key words: Pre-cutting; Endoscopic retrograde cholangiopancreatography; Biliary cannulation; Complication; Pancreatitis

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INTRODUCTION

Pre-cutting technique is useful in allowing biliary access when standard cannulation techniques with double lumens sphincterotome failed^[1-4]. It is known to significantly increase not only the rate of selective biliary cannulation but also the complication rate. This may be because of the multiple attempts to achieve cannulation by using sphincterotome catheter before pre-cutting and causing excess edema and papillary trauma. One earlier study has described conducting a needle knife cut to achieve biliary cannulation in difficult cases, a so called early pre-cutting technique, is more safe and effective compared with performing the pre-cut late in the procedure^[5]. However, the data of this technique is still limited. The aim of this retrospective study was to compare the results and complications of early pre-cutting with the standard biliary cannulation technique for ERCP in the hands of an experienced endoscopist.

MATERIALS AND METHODS

At Siriraj GI Endoscopy Center, Faculty of Medicine, Siriraj hospital, Mahidol University, Bangkok, Thailand, 416 consecutive therapeutic Endoscopic retrograde cholangiopancreatography (ERCP) procedures from January 2003 to December 2004 were included in the study. These were performed by one experienced endoscopist (> 1000 career ERCPs, with an ongoing workload of > 200 ERCPs each annually: T.A.). They were classified into two groups (A and B) by the technique of biliary cannulation.

All cases were commenced with a standard double-lumen sphincterotome (Ultratome XL; Boston Scientific, Natick, USA) preloaded with contrast. If required, a guidewire (0.035" Jackwire; Boston Scientific, Miami, USA) was used to aid biliary cannulation (Standard cannulation technique: group A). If biliary access failed after 10 min or if more than 3 pancreatic injections with contrast were

Table 1 Characteristics of patients in 416 ERCP procedures

| | All (n = 416) | Group A (n = 293) | Group B (n = 123) |
|-------------------------------|------------------|----------------------|----------------------|
| Age (yr) (mean) | 60.6 | 61.2 | 59.5 |
| Gender: Male | 214 | 153 | 61 |
| Female | 202 | 140 | 62 |
| Procedure: Elective | 399 | 278 | 121 |
| Emergency | 17 | 15 | 2 |
| Anesthesia: TIVA | 410 | 287 | 123 |
| GA | 3 | 3 | 0 |
| Indications (%) | | | |
| Cholelithiasis | 203 (48.8) | 140 (47.8) | 62 (50.4) |
| Biliary stricture | | | |
| Malignant | 150 (36.1) | 99 (33.8) | 52 (42.3) |
| Benign | 22 (5.3) | 21 (7.2) | 3 (2.4) |
| GS pancreatitis | 4 (1.0) | 4 (1.4) | 1 (0.8) |
| Bile leakage | 3 (0.7) | 3 (1.0) | 2 (1.6) |
| SOD | 2 (0.5) | 2 (0.7) | 0 |
| Miscellaneous | 32 (7.7) | 24 (8.2) | 3 (2.4) |
| Factors effect to cannulation | | | |
| Juxtaduodenal diverticulum | | | |
| Previous operation | 66 | 46 (15.7) | 20 (16.3) |
| HPB surgery | 73 | 47 (16.0) | 26 (21.1) |
| Billroth II gastrectomy | 4 | 3 (1.0) | 1 (0.8) |

TIVA: Transinavenous anesthesia; GA: General anesthesia; SOD: Sphincter of Oddi dysfunction.

made (whichever occurred first), the early pre-cutting technique with needle knife catheter (MicroKnife XL, Boston Scientific, Natick, USA) (group B) was used.

In group A, diathermy was applied with the Endocut mode in the ERBE system (120 W cut; 15 W coagulation) (ERBE USA, Atlanta, GA), which adjusts the amount of cutting and coagulating current automatically, depending on the tissue resistance. Group B was performed with pure cutting mode in the same system.

Sedation for the procedures consisted of a combination of propofol or fentanyl and midazolam with buscopan as needed for duodenal relaxation. In left lateral position, all patients underwent continuous cardiopulmonary monitoring throughout the procedure by an anesthesiologist. If the patient conditions were not appropriated for sedation we used the general anesthesia for the procedures. All procedures were done using an Olympus video duodenoscope (TJF160R, Olympus Corporation, Tokyo, Japan).

After completion of the ERCP, admission into the inpatient hospital service was arranged to rule out post-ERCP complications. Follow-up was determined by a retrospective review of the patients' computerized medical records. Complications were defined using criteria as Cotton *et al*^[6] described. The statistical software package SPSS for Windows Version 11 (SPSS Inc, Chicago, IL) was used to analyze the data. A significance level of 5% was used throughout.

RESULTS

469 ERCP procedures were performed between January 2003 and December 2004. 53 diagnostic ERCP procedures without endoscopic sphincterotomy or biliary access were excluded. Of this 416 procedures (214 men, 202 women; mean age 60.56 years, range 14-97 years) included in the

Table 2 Overall complications of therapeutic ERCP n (%)

| Complications | Total | Group A | Group B |
|---------------|---------|---------|---------|
| Cholangitis | 2 (0.5) | 1 (0.3) | 1 (0.8) |
| Perforation | 2 (0.5) | 1 (0.3) | 1 (0.8) |
| Bleeding | 1 (0.2) | - | 1 (0.8) |
| Pancreatitis | - | - | - |
| Hypoxia | 1 (0.2) | 1 (0.3) | - |
| Total | 6 (1.4) | 3 (1.0) | 3 (2.4) |

study, 293 procedures were classified in group A and 123 procedures were in group B.

The characteristic of the group A and group B populations were compared. There were no statistically significant difference between the two groups in age, gender, setting of the procedure, and choice of anesthesia. Indication for therapeutic ERCP and the factors that were claimed as affecting the difficulty of biliary cannulation were compared which there were no statistically difference also (Table 1).

The results of first attempt cannulation

The overall success rate of biliary cannulation was 95%. The success rate of the group A was 98% and group B was 87.8%. The difference result of success rate of first attempt cannulation were statistically compared between the two groups by used Chi-Square Tests found that the lower success rate of group B was statistically significant.

Complications

Of the 416 procedures, overall complications occurred in 6 procedures (1.4%) (Table 2). The overall incidence of hemorrhage, perforation and cholangitis was 0.2%, 0.5% and 0.5%, respectively. None of the study patients developed post-ERCP pancreatitis. One anesthetic complication (hypoxia) was occurred (0.2%). No procedure-related mortality was occurred. The complications of two groups were compared by using Chi-Square Test which there was no statistically significant difference.

DISCUSSION

At early period, the use of precut papillotomy as alternative method for achieve deep cannulation of the bile duct was not recommended for inexperienced endoscopists because it was claimed to increase post-ERCP complications. The procedure should be reserved for used by experts in high risk patients with strong indication for sphincterotomy when other standard techniques have been exhausted. The device that is commonly used to perform precut is the needle knife, first described in 1977 by Onses and Kahrs^[7]. Since then, several authors have reported the successful application of this technique, especially for a suprapapillary prominent CBD^[8-11]. There were many studies of precut sphincterotomy, even retrospective and prospective review supporting of precut sphincterotomy was the procedure that can increase the success rate of biliary cannulation^[12-19]. Each study had difference designs, number of cases, number of endoscopist, indications

of therapeutic ERCP which can results the difference outcome. In this study, all of the ERCP procedures were performed by single experience endoscopist (TA) and the success rate and complications of early pre-cutting technique were compared to standard technique.

In this study, early-precutting with the needle knife was needed in the care of 123 of 416 (29.6%) patients among whom standard technique of achieving CBD access had failed. We made subgroup analysis in success rate of cannulation between subgroup A (precutting technique excluded patients with the prior attempted bile duct cannulation: 165 patients) and group B. There is no statistical different between these two groups. Rollhauser *et al*^[15] published their experience with 68 needle knife papillotomy procedures. They found an improvement in successful cannulation from 68% to 98%, suggesting that the success rate improved with endoscopist's experience. In our study, the success rate of 1st attempted CBD cannulation after precutting (group B) was 87.8%. This success rate is comparable to that of other studies, which ranged from 66%-99%^[20-22].

Complications can be attributed to several independent patient- and technique-related risk factors, including the endoscopist's skill^[15]. The incidence of clinical pancreatitis following precutting was reported 2.1%-3.8%^[20,23,24]. It has often been postulated that relatively high postprecut pancreatitis rates are related to the prolonged period of cannulation attempts that occurs before precut is finally performed^[25]. These repeated cannulation attempts also mean that precut is often performed under difficult conditions, with a papilla that is already edematous and distorted. The relatively low rates of successful biliary cannulation immediately after precut in several reports may reflect this problem. In this study, there was no post-ERCP complications. This may result from our policy that precut sphincterotomy is routinely performed after 3 PD injection/cannulation and the high success rate of immediate CBD cannulation after precutting.

Bleeding as a result of early-precutting with a needle knife occurred 0.8% of our patients similar to those found in several investigators, such as O'Connor *et al*^[26] (1.2%), and Huibregtse *et al*^[1] (1.5%). In the present study, the rate of perforation and cholangitis in the group treated using the standard approach was 0.3% and not significantly higher than that of the group treated primarily with precut (0.8%). Because of very low event of overall complication (1.4%) and no statistically significant differences between the two groups, it is unnecessary to find the predictor or confounding factors of the complication.

In summary, the early pre-cutting technique for biliary cannulation when cannulation of the CBD when performed by standard methods is not possible, is safe and effective by the experienced endoscopist.

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