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ORIGINAL ARTICLE

Post-ERCP pancreatitis in patient undergo needle-knife sphincterotomy versus transpancreatic sphincterotomy

Kritsaran Sothanapaisan, M.D.,[1,*] Chaiyaporn Suwitchakul, M.D.[1]

ABSTRACT

Background. Endoscopic Retrograde Cholangiopancreatography (ERCP) is widely used in pancreaticobiliary diseases for diagnostic and therapeutic purposes. In patients with difficult biliary cannulation is increase the risk of adverse effects such as post-ERCP pancreatitis, bleeding, perforation, and cholangitis. Needle-knife sphincterotomy(NKS) and Transpancreatic sphincterotomy(TPS) are technique for patients with difficult cannulation.

Objectives. Compare the adverse event rate of TPS and NKS.

Materials and Methods. The study was carried out as retrospective analyzed the medical records, from January 2015 to December 2019. The study population consisted of OPD and IPD patients who had indication for required ERCP.

Results. There were 86 (38 male, 48 female) patients underwent ERCP. Subjects were divided into 2 groups: 36 in NKS and 50 in TPS. Mean age 56.3 yrs in NKS group and 56.9 yrs in TPS group (p = 0.864). Success canulation rate was 91.7% for NKS versus 96.0% for TPS (p = 0.645). Post-ERCP pancreatitis was 0% for NKS versus 2.0% for TPS (p = 0.393). Other outcome measures were equivalent.

Conclusion. NKS and TPS were no differences in adverse event rate.

Keywords : Endoscopic Retrograde Cholangiopancreatography, Needle-knife sphincterotomy, Transpancreatic sphincterotomy, post-ERCP pancreatitis

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[1] Department of Surgery,
Bangkok Metropolitan Administration General Hospital,
Bangkok Province, Thailand

Corresponding Author: Kritsaran Sothanapaisan
514, Luang Rd., Pom Prap, PomprapSattruphai,
Bangkok 10100 Thailand
Telephone: +66-2-2208000, kritsaran55@gmail.com

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INTRODUCTION

Endoscopic Retrograde Cholangiopancreatography (ERCP) is widely used in pancreaticobiliary diseases for diagnostic and therapeutic purposes. Successful biliary cannulation is easily achieved in most patients with a few cannulation attempts in the first few minutes of the procedure; however, the initial attempts are not successful in 5-10% of patients with a native major papilla.[1] Difficult biliary cannulation is defined in the ESGE guideline as more than five contacts with the papilla while attempting to cannulate, more than 5 minutes spent attempting to cannulate after visualization of the papilla, or more than one unintended pancreatic duct cannulation.[2] In patients with difficult biliary cannulation, prolonged cannulation attempts, and advanced techniques are known to increase the risk of adverse effects such as post-ERCP pancreatitis, bleeding, perforation, and cholangitis.

Needle-knife sphincterotomy (NKS) and Transpancreatic sphincterotomy (TPS) are technique for patients with difficult cannulation. In patients with difficult biliary cannulation and use advanced techniques are increase the risk of post-ERCP pancreatitis 2-9%.[5-6] In the previous studies, the results of post-ERCP pancreatitis was not different in NKS and TPS,[7-10] some studies show that TPS was safer then NKS.[3-4]

Which each year Bangkok Metropolitan Administration General Hospital are a lot of ERCP services and have two different ways for difficult biliary cannulation are Needle-knife sphincterotomy (NKS) and Transpancreatic sphincterotomy (TPS) at the discretion to used by surgeon. There are minimal data comparing NKS and TPS in Asia-pacific patients and no data in Thailand. Therefore, the purpose of this study to compare post-ERCP pancreatitis and other adverse event, cannulation success rate, postoperative length of stay in Bangkok Metropolitan Administration General Hospital patients.

MATERIALS AND METHODS

A retrospective study design was used to analyze outcomes using the BMA hospital medical charge record database after approving by Ethic committee. The study population consisted of patients who had indication for required endoscopic retrograde cholangiopancreatography (ERCP). Inclusion criteria was age above 18 years old. patients with biliary tract obstruction who required ERCP such as choledocholithiasis, malignant biliary obstruction or benign biliary stricture. Patient who had ERCP and cannulation with sphincterotomy by Needle-knife sphincterotomy (NKS) or Transpancreatic sphincterotomy (TPS) technique. Exclusion criteria were patient with sphincterotomy by NKS and TPS technique in same operation, history with previous sphincterotomy, papillary dilation, gastrectomy, choledochoenterostomy, patients with acute pancreatitis and patients with incomplete medical record.

The primary outcome was post-ERCP pancreatitis. The secondary outcome were cannulation success rate, operation time, intraprocedural hemorrhage, postoperative length of stay and other adverse event such as cholangitis, perforation, bleeding. Sample size was calculated by formula for test in difference two independent means.

Definition

Post-ERCP pancreatitis described by Cotton et al.[11] Clinical pancreatitis, amylase/lipase of at least 3 times the normal at more than 24 h after the procedure, requiring admission or prolongation of planned admission. Needle-knife sphincterotomy: the incision started from the upper lip of the papillary orifice (at the 11-o'clock position) and proceeded upward over the papillary mound. Transpancreatic sphincterotomy: sphincterotome was inserted into the pancreatic duct, sphincterotomy was directed toward the 11- o'clock position and through the septum to completely unroof the papilla. Prophylaxis P-duct (PD) stent insertion was selected when cannulate to p-duct above 3 times.

STATISTICAL ANALYSIS

The baseline characteristics of patients were presented using number, percent, mean and SD or median (inter quartile range; IQR). Comparisons of outcome between NKS and TPS group were conducted using Chi square method for categorical variables or independent T-test for continuous variables. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 86 patients were included in the study (38 male, 48 female) were recorded in groups (NKS group: n = 36; TPS: n = 50).

The two groups were similar in age, sex and underlying disease. (Table.I). Mean age was 56.31 years old in NKS group and 56.90 years old in TPS group (p = 0.864). Indication for ERCP almost was choledocolithiasis and were similar in both group, 66.7% in NKS group and 72.0% in TPS group (p = 0.631). (Table.I)

The surgical technique, ampulla was dilated 41.7% in NKS group and 44.1% in TPS group (p =0.503). Stone extraction was done 72.2% in NKS group and 70.0% in TPS group (p =0.823). Stone was removed by balloon extraction 73.1% in NKS group and 68.6% in TPS group, busket extraction 3.8% in NKS group and 2.9% in TPS group and both technique 23.1% in NKS

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Table 1.Demographic data in patient undergo needle-knife sphincterotomy and transpancreatic sphincterotomy

	Operation		
	Needle-Knife sphincterotomy	Transpancreatic sphincterotomy	p-value
Age, year (mean ±SD)	56.31 ±15.325	56.90 ±16.255	0.864
Sex, n (%)			
Male	17 (47.2)	21 (42.0)	0.63
Female	19 (52.8)	29 (58.0)	
Underlying, n (%)			
Yes	17 (47.2)	24 (48.0)	0.94
No	19 (52.8)	26 (52.0%)	
Diabetes mellitus, n (%)			
Yes	6 (33.3)	13 (44.8)	0.435
No	12 (66.7)	16 (55.2)	
Hypertension, n (%)			
Yes	12 (66.7)	20 (69.0)	0.869
No	6 (33.3)	9 (31.0)	
Liver disease, n (%)			
Yes	1 (5.6)	1 (3.4)	0.731
No	17 (94.4)	28 (96.6)	
Chronic renal disease, n (%)			
Yes	2 (11.1)	8 (27.6)	0.18
No	16 (88.9)	21 (72.4)	
Other disease, n (%)			
Yes	8 (44.4)	14 (48.3)	0.798
No	10 (55.6)	15 (51.7)	
Indication, n (%)			
Choledocolithiasis	24 (66.7)	36 (72.0)	
Malignant biliary obstruction	3 (8.3)	5 (10.0)	0.631
Benign biliary stricture	1 (2.8)	0 (0.0)	
Other	8 (22.2)	9 (18.0)	
Peripapillary diverticulum, n (%)			
Yes	4 (11.1)	5 (10.0)	0.688
No	32 (88.9)	45 (90.0)	

group and 28.6% in TPS group (p =0.878). Stent was placed 36.1% in NKS group and 54.0% in TPS group (p =0.101). Peripapillary diverticulum was found in 11.1% in NKS group and 10.0% in TPS group (p =0.688). (Table.II)

The primary outcome of this study, post-ERCP pancreatitis was no significant for NKS and TPS group (NKS, 0.0%; TPS, 2.0%; P = 0.393). The secondary outcome, cannulation success rate (NKS, 91.7%; TPS, 96.0%; P = 0.645), operative time (NKS, 60.03 min; TPS, 47.78 min; P = 0.141), post-operative length of stay (NKS, 4.90 days; TPS, 4.71 days; P = 0.885) were not significant in both groups. (Table.III)

Table 2. Technique of needle-knife sphincterotomy and transpancreatic sphincterotomy

	Operation		p-value
	Needle-Knife sphincterotomy	Transpancreatic sphincterotomy	
Dilate ampulla, n (%)			
Yes	15 (41.7)	22 (44.0)	0.503
No	21 (58.3)	28 (56.0)	
Stone extraction, n (%)			
Yes	26 (72.2)	35 (70.0)	0.823
No	10 (27.8)	15 (30.0)	
Stone method, n (%)			
Balloon extraction	19 (73.1)	24 (68.6)	0.878
Basket extraction	1 (3.8)	1 (2.9)	
Both	6 (23.1)	10 (28.6)	
Stone status, n (%)			
Complete extraction	18 (64.3)	21 (56.8)	0.685
Retain stone	5 (17.9)	10 (27.0)	
No CBD stone	5 (17.9)	6 (16.2)	
Stent Placement, n (%)			
Yes	13 (36.1)	27 (54.0)	0.101
No	23 (63.9)	23 (46.0)	
Stent type, n (%)			

CBD stent	11 (84.6)	14 (51.9)	0.079
PD stent	2 (15.4)	6 (22.2)	
Both	0 (0.0)	7 (25.9)	

Table 3. Outcome in patient undergo needle-knife sphincterotomy and transpancreatic sphincterotomy

	Operation		p-value
	Needle-Knife sphincterotomy	Transpancreatic sphincterotomy	
Post-ERCP pancreatitis, n (%)			
Yes	0 (0.0)	1 (2.0)	0.393
No	36 (100.0)	49 (98.0)	
Other complication, n (%)			
Cholangitis	0 (0.0)	0 (0.0)	
Hemorrhage	1 (2.8)	0 (0.0)	0.419
Perforation	0 (0.0)	0 (0.0)	
None	35 (97.2)	50 (100.0)	
Operative result, n (%)			
Success cannulation	33 (91.7)	48 (96.0)	0.645
Fail cannulation	3 (8.3)	2 (4.0)	
Operation time, min (mean ±SD)	60.03 ±39.58	47.78 ±28.14	0.141
Postoperative length of stay, day (mean ±SD)	4.90 ±5.08	4.71 ±5.82	0.885
Intraprocedural hemorrhage, ml (mean ±SD)	0.91 ±3.53	0.0 ±0.0	0.135

DISCUSSION

Successful bile duct cannulation is necessary for diagnostic and therapeutic ERCP. However, cannulation of the bile duct can be quite difficult, and ERCP with prolonged manipulation is associated with increased risk for complications. Thus, in patients with difficult bile duct cannulation, several techniques have evolved over the past years to overcome this problem.

Needle-knife sphincterotomy is the precut technique which is most widely used to expose the orifice. NKS is highly successful when performed by an experienced endoscopist but has an increased potential for complications. Transpancreatic sphincterotomy might be technically less demanding, and the depth of incision might be easier to control compared with NKS.

In our study was retrospective analyzed compared adverse event rate showed that NKS and TPS group were not differences in post-ERCP pancreatitis, the results were same as previous studies.[7-10] The other complication was not difference in both groups. Successful cannulation, operative time and post-operative length of stay were not significant different between groups.

So this is not a randomized control trial and selection bias could not be avoided. However, the demographics data in this study was no difference in two groups. Further randomized controlled trials comparing the success and complications of two precut techniques would identify the optimal precut strategies.

CONCLUSION

Needle-knife sphincterotomy and Trans-pancreatic sphincterotomy were not differences in adverse event rate. Therefore, we suggest that NKS and TPS can be performed safely

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