

## Therapeutic Biliary and Pancreatic Endoscopy in Palestine-Gaza Strip; a Three Year Retrospective Audit

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### Abstract

**Background:** Endoscopic retrograde cholangiopancreatography (ERCP) is a gold standard tool in diagnosis and mainly treatment of biliary and pancreatic disease. This invasive technique has well-described potential morbidity and mortality. However, no comprehensive information exists till date from Palestine.

**Aim:** This study aimed to determine outcome and complications of ERCP procedures performed in the European Gaza Hospital, Gaza.

**Methods:** a retrospective facility-based study was conducted on 103 consecutive patients underwent ERCP in the European Gaza Hospital from 2017 to 2019. Patients' records were reviewed and appropriate data were collected. Descriptive and multivariate logistic regression.

**Results:** mean patients' age was 55.5±17.8 years, and 53.4% of them were females. Half of patients (50.5%) presented with jaundice as a chief complaint, and 62% had a past history of gallbladder stones and/or cholecystitis. Three quarter of ERCP procedures were elective, in which most common indication was obstructive jaundice resulted from choledocholithiasis (77.7%). successful cannulation was reported in majority of ERCP procedures (95.1%) and sphincterotomy was mainly intervened (90.3%). ERCP was performed mainly for therapeutic purpose either by clearance of common bile duct (CBD) or biliary stenting (67% and 20.4%, respectively). Most ERCPs time ranged between 30 to 60 minutes. overall complication rate was 6.8%, mainly bleeding (2.91%) followed by pancreatitis (1.94%). Predictors for risk of complications were doing pancreatic injection (OR: 18.8, CI95%: 2.18-162.45, P=0.008) and CBD clearance (OR: 0.15, CI95%: 0.03-0.86, p=0.033).

**Conclusion:** despite reported morbidity and risk of mortality, ERCP remains a significant approach for management of pancreatobiliary diseases.

**Keywords:** ERCP, CBD stones, Pancreatitis, Cholangitis, Biliary stent, Precut sphincterotomy.

## Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) has been first used in 1968 to diagnose and treat pancreatic and biliary diseases. It is a complicated and invasive endoscopic technique with serious and life-threatening complications. ERCP is a complex intervention, performed by physician or Gastroenterologist, which requires very specialized equipment and high competent personnel. A specialized side-view endoscope is moved through mouth until reach the duodenum, then accessories are inserted into biliary and/or pancreatic duct for management. As a therapeutic intervention, ERCP can be used to relieve bile duct obstruction by removing stones, balloon dilation or by insertion a stent. Moreover, performing trans-papillary drainage of pseudocysts when it is related to pancreatic duct. As a diagnostic tool, it is used to visualize the ampulla and take biopsies to rule out pancreatic and biliary malignancy. Evolution of the ERCP has simultaneously emerged with development of sensitive but non-invasive modalities for diagnosis, such as magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS).

ERCP carries risk for serious complications, occur in 10% of patients, including but not limited to bleeding, pancreatitis, and perforation, and overall mortality is 0.1% to 0.5% (1, 2). Pancreatitis is the most common and its incidence varies 1-7% and can touch 25% in high risk patients (3). Predictors include difficult cannulation, pancreatic injection, and use of precut sphincterotomy. Bleeding is also common, resulting from sphincterotomy, and is estimated to occur in 0.3% to 2% (4). Perforation occurs, between 0.3% to 0.6% of ERCP, as trauma from sphincterotomy and intraductal guidewire manipulation. Other complications include cholangitis, cholecystitis, and stent-related complications. In the Gaza strip, two referral hospitals provide ERCP service and serve more than two million inhabitants; one in Al-Shifa medical complex and another in the Gaza European hospital. The ERCP service was initiated since 2013, however, there is lack data on performance of these hospitals. This study aimed to retrospectively analyse outcome and complications of ERCP intervention during three years from 2017-2019 at the Gaza European hospital.

## Materials and Methods

This was a retrospective facility-based study conducted on 103 consecutive patients underwent ERCP between 2017-2019 at the European Gaza hospital by two experienced medical gastroenterologists. Patients' records were retrieved and analyzed accordingly. Data included patients' demographics, clinical characteristics, past medical history, ERCP indication and findings, cannulation success and technique, devices used during the

procedure, intervention, investigation/imaging results, and complications. Records with incomplete information and patients' refusal to be involved were excluded from analysis. Ethical approval was obtained from the Research Committee of Ministry of health and European Gaza Hospital. Moreover, patients gave their consent prior beginning of ERCP. The procedure was performed under general anesthesia and patients were admitted for observation for at least 24 hours. Intravenous Propofol and fentanyl were administered for all procedures, and sometimes ketamine was added. Complications of ERCP were determined according to classification of (5). Complication is any adverse event occurs 30 days after ERCP and is related to it and necessitate at least one night of hospitalization. Severe complications required at least ten days' hospitalization and needed surgical, invasive radiological interference or admission to intensive care unit or death. Patients were followed for 30 days' post ERCP and were called by telephone to identify any problems related to procedure. The IBM SPSS software version 23 was used for data analysis. Categorical variables were presented informs of frequency and percentage and were compared using Chi-square test, while continuous variables were expressed informs of means and standard deviations (SD). Independent factors associated with increased risk for complications were examined by univariate analysis first. Then, independent variables with  $P < 0.25$  were included and run into multivariate logistic regression. Odds ratio (OR), and confidence interval at 95% (CI 95%) were presented accordingly and the statistical significance was set at  $P < 0.05$ .

## Results

One hundred three patients were enrolled in the study. The men age was  $55.5 \pm 17.88$  years old (range: 10-89 years), and females represented more than half of the sample (53.4%). Half of patients had past history of cholecystitis (55.3%) and complained of jaundice (50.5%) and pain associated with jaundice (34%). Most ERCP procedures were elective (75.7%), were related to biliary causes (93.2%) and persisted between 30-60 minutes (85.4%). Biliary related causes included stones in CBD, post-op biliary leak, biliary strictures, cholangitis and biliary tumors. Clearance of CBD calculi was the most intervention performed (67%) followed by biliary stenting (20.4%) using plastic materials and pancreatic injection was performed in 3.9% of patients. Sphincterotomy was performed in majority of patients (90.3%) (Table 1). Successful cannulation was achieved in 95.1% of patients (98/103) and only 7 patients (6.8%) exposed to complications. Common reported complications were: perforation (1/103, 1%), pancreatitis (2/103, 1.9%), bleeding (3/103, 2.9%) and sepsis (1/10, 1%). Most patients were discharged with over all good health (91/103, 88.3%), whereas, 12 patients (11.7%) were referred to West Bank hospitals for further management.

**Table 1: Socio-Demographic and Clinical Characteristics**

Variables	n	(%)
Gender	n	
M	48	46.6
F	55	53.4
Age (M $\pm$ SD): 55.5 $\pm$ 17.88		
< 35	14	13.4

36-64	53	51.5
≥ 65	36	35.0
Past history		
Pancreatitis	4	3.9
GBS / cholecystitis	57	55.3
Chronic disease	31	30.1
Chief complain		
Abdominal pain	10	9.7
Jaundice	52	50.5
Pain and jaundice	35	34
Pain and fever	1	1
Pain and itching	1	1
Jaundice and itching	2	1.9
Jaundice and fever	2	1.9
Type of intervention		
Elective	78	75.7
Urgent	25	24.3
Indication		
Pancreatic cause	4	3.9
Biliary cause	96	93.2
Miscellaneous	3	2.9
Procedure time (minutes)		
≤ 60	88	85.4
> 60	15	14.6
Result of cannulation		
Successful	98	95.1
Unsuccessful	5	4.9
Pancreatic injection		
Yes	4	3.9
No	99	96.1
Technique		
Sphincterotomy	93	90.3
Papillotomy	4	3.9
Pre-cut fistulotomy (NKF)	1	1
Pre-cut papillotomy	1	1
Trans-pancreatic pre-cut	1	1
sphincterotomy Balloon dilatation	3	2.9
Intervention		
Clearance of CBD calculi	69	67
Biliary stenting	21	20.4
Biliary stricture dilation	3	2.9
Pancreatic papillotomy and stenting	2	1.9
Pancreatic duct stone clearance	2	1.9
Normal ERCP –No therapeutic intervention	1	1
Failure to cross tight CBD stricture	4	3.9
Failure to visualize ampulla/bleeding ampulla	1	1

Findings from radiological investigations revealed most patients had gallbladder stones and nearly one fourth had dilated CBD as confirmed by abdominal ultrasound and MRCP (70.4% and 57.3%, respectively and 24.5% and 32.3%, respectively) (Table 2). One patient had a normal ERCP finding and 5 (4.9%) had

failed procedure; of which 4 patients had tight CBD stricture and one patient had non-visualized ampulla due to bleeding. Laboratory findings, including ALT, AST, serum bilirubin (total and direct), ALP and hemoglobin, were compared before and after ERCP. Table 2 summarizes findings pre and post ERCP procedure.

**Table 2: Radiological findings from abdominal ultrasound and MRCP pre-ERCs**

Radiology findings	n	%
Pre- Ultrasound		
Normal	1	1
Stones	69	70.4
Dilated CBD	24	24.5
Wall thickness	4	4.1
Pre-MRCP		
Stones	55	57.3
Dilated CBD	31	32.3
Strictures	3	3.1
Tumor	2	2.1
Filling defect	5	5.2

Significant reduction in findings are observed ( $P < 0.0001$ ) (Table 3). In bivariate analysis of independent variables associated with complications, five independent factors were chosen for multivariate regression analysis ( $P < 0.05$ ): age, technique performed during ERCP, pancreatic duct injection, type of intervention and pre-ERCP anemia (Table 4) Multivariate logistic regres-

sion showed that pancreatic injection and type of intervention in clearance of CBD calculi were significantly associated with occurrence of complications (OR: 18.8, CI95%: 2.18-162.45,  $P = 0.008$  and OR: 0.15, CI95%: 0.03-0.86,  $p = 0.033$ ), respectively (Table 5).

**Table 3: laboratory findings pre and post-ERCs**

Investigations	Mean score of lab results, frequency and percentage		P value
	Pre ERCP	Post ERCP	
	n (%)	n (%)	
Total bilirubin	5.32±3.51	3.64±4.18	< 0.0001
Normal	9 (9.3)	14 (14)	
Abnormal (>1mg/dl)	90 (84.9)	86 (83.1)	
Direct bilirubin	2.83±2.85	1.81±1.7	< 0.0001
Normal	1 (1)	1 (1)	
Abnormal (>0.2mg/dl)	96 (93.2)	98 (95.1)	
ALT	131.23±13.8	105.7±11.3	< 0.0001
Normal	5 (5)	12 (11.9)	
Abnormal (>40)	96 (93.1)	90 (86.2)	
AST	157.88±14.7	100.36±11.14	< 0.0001
Normal	7 (7)	17 (17)	
Abnormal (>40 U/L)	93 (90.1)	83 (80.1)	
ALP	679.07±11.8	397±27.8	< 0.0001
Normal	19 (19)	49 (49)	
Abnormal (>300 U/L)	81 (78.1)	51 (48.1)	
HB Mean ±SD	11.99±1.55 g/dl	11.49±1.6 g/dl	< 0.0001
≤ 10 g/dl	14 (13.9)	19 (18.8)	
> 10 g/dl	87 (84.2)	82 (79.3)	

**Table 4: Bivariate Analysis of Independent Factors Associated with Complications**

Variables		Complications				P-value
		No		Yes		
		No.	%	No.	%	
Age	<60	59	96.7	2	3.3	0.02*
	>60	37	88	5	12	
Gender	Male	46	95.8	2	6.2	0.44
	Female	50	91	5	96	
Past history	Pancreatitis	3	75	1	25	0.3
	Gallbladder stones/ Cholecystitis	54	94.7	3	5.3	
	Chronic disease	29	93.5	2	6.5	
Indication	CBD stones	74	92.5	6	7.5	0.58
	Post-op biliary leaks	3	100	0	0	
	Biliary strictures	6	100	0	0	
	Cholangitis	1	100	0	0	
	Biliary tumors	6	100	0	0	
	Pancreatic carcinoma	1	100	0	0	
	Recurrent pancreatitis workup	4	80	1	20	
	Pancreatic leak (post-traumatic)	1	50	1	50	
	Post liver transplant	1	100	0	0	
Extra biliary malignancy, causing biliary obstruction	2	100	0	0		
Indication	Biliary cause	90	93.75	6	6.25	F= 1.171 P= 3.14
	Pancreatic cause	3	75	1	25	
	Miscellaneous	3	100	0	0	
Procedure type	Urgent	23	92	2	8	0.67
	Elective	73	93.5	5	6.5	
Procedure time	0.5	3	75	1	5	0.76
	0.75	2	100	0	50.3	
	1	76	92.6	6	7.4	
	1.25	2	100	0	0	
	1.5	5	100	0	0	
	2	7	100	0	0	
	3	1	100	0	0	
Technique	Sphincterotomy	88	94.6	5	5.4	<0.01*
	Papillotomy	4	100	0	0	
	Pre-cut Fistulotomy (NKF)	1	100	0	0	
	Pre-cut Papillotomy	0	0	1	100	
	Trans pancreatic Pre-cut sphincterotomy (TPS)	0	0	1	100	
	Balloon dilatation	3	100	0	0	
Pancreatic duct injection	No	94	94.5	5	5.5	0.02*
	Yes	2	50	2	50	
Intervention	Clearance of CBD calculi	66	95.6	3	4.4	0.08
	Biliary stenting	20	95	1	5	
	Biliary stricture dilation	2	66.6	1	33.3	
	Pancreatic papillotomy and stenting	2	100	0	0	
	Pancreatic duct stone clearance	1	50	1	50	
	Normal ERCP –No therapeutic intervention	1	100	0	0	
	Failure to cross tight CBD stricture	3	75	1	25	
	Failure to visualize ampulla/ bleeding ampulla	1	100	0	0	

**Table 5: Multivariate Regression analysis of independent variables**

Univariate logistic regression	B	S.E.	Wald	Sig.	Odds (95%CI)
<b>Age groups</b>					
>60	0.711	0.792	0.805	0.369	2.04 (0.43-9.61)
< 60					Ref
<b>Procedure time (min)</b>					
≤ 60	1.110	1.174	0.894	0.344	3.03 (0.3-30.27)
> 60					Ref
<b>Technique</b>					
Sphincterotomy	-1.482	0.915	2.625	0.105	0.23 (0.04-1.36)
Others					Ref
<b>Pancreatic duct injection</b>					
Yes	2.934	1.100	7.110	0.008	18.8 (2.18-162.45)
No					Ref
<b>Intervention</b>					
Clearance of CBD calculi	-1.887	0.884	4.555	0.033	0.15 (0.03-0.86)
Biliary stenting	-1.792	1.218	2.164	0.141	0.17 (0.02-1.81)
Others					Ref

### Discussion

In this study, we sought to evaluate outcomes and predictors for complications post-ERCP at the European Gaza Hospital. The dominant indication for ERCP was choledocholithiasis followed by bile duct cancer, bile duct stricture, and post-operation biliary leak (6, 7). The most common finding on ERCP was bile duct stone (35.5%). In most cases, it was associated with filling defects, strictures, or leaks. ERCP is the most likely initially treatment for choledocholithiasis (8). It is highly effective in detecting and removing bile duct stones before laparoscopic cholecystectomy (9, 10). The major endoscopic intervention applied during ERCP in our study was endoscopic sphincterotomy, which is one of the most useful interventions that aids in the management of choledocholithiasis, papillary stenosis, ampullary carcinoma in poor surgical candidates, sphincter of Oddi dysfunction, and bile duct injuries. Also, it facilitates biliary stent placement and access to the pancreatic duct (11). The other intervention applied was biliary stenting. Biliary stenting was successfully used in preoperative drainage or palliative treatment of pancreaticobiliary malignancies; especially when complete the bile duct clearance was not ensured. It was also used in patients with large bile duct stones that could not be removed in a single session (12).

Complications and mortality rates of ERCP have been reported to range from 4.0% to 15.9% and from 0.06% to 2.4% respectively. In our study, the complication rate was 6.8% which is in the same range as reported in other studies (13-15). The risk of bleeding is (0.14- 1.5%) (16-18). In our study, bleeding was reported in 2.9% of patients as the most common complication and higher than similar studies. Post ERCP bleeding can be graded as mild, moderate, or severe based on the consensus definition. We reported mild bleeding complications which were easily controlled without intervention. No cases of severe bleeding requiring blood transfusion or long hospital admission were reported. Post-ERCP pancreatitis is one of the most serious complications. Its incidence was reported to be between 1.3%

to 15.1%. On 108 randomized controlled trials (RCT) involving 13296 patients reported an overall incidence of 9.7% for pancreatitis, with an increased incidence of 14.7% in the high-risk patients (19-21). In our study, the rate of post-ERCP pancreatitis was 1.9%, which is lower than that of the previous studies and this may be attributed to the fact that we have a small sample. Post ERCP acute pancreatitis can be graded as mild, moderate, or severe based on the consensus definition. In the present study, different from previous studies, no cases of moderate or severe pancreatitis or long admission were reported because all cases were mild pancreatitis.

Perforation was defined as air or contrast leak into the peritoneal or retroperitoneal cavity recognized either at the time of ERCP or on the subsequent imaging. We reported one patient had perforation (1%). Previous studies reported perforation to occur in 0.35% to 2.1% of patients (22). Cholangitis was characterized as a septic illness lasting more than 24h in an obstructed patient without any other clear source of infection. Mild cholangitis refers to a hospital treatment lasting less than 48 h; moderate cholangitis refers to a hospital treatment lasting three or more days, or a treatment requiring endoscopic or percutaneous intervention, and severe cholangitis refers to a septic shock or one that requires emergent surgery. We reported one case of septic cholangitis 1% compared to 4.9% (5/102) and 1.4% (6/423) reported by Nayab and his colleagues (2018) and Gurung and his colleagues (2014) respectively (23, 24).

According to the previous studies, predicting factors for pancreatitis included younger age, female sex, normal serum bilirubin levels, a history of acute recurrent pancreatitis, and some procedure-related factors such as frequent pancreatic duct visualization, cannulation time more than 10 min, needle-knife precut, pancreatic sphincterotomy, implantation of pancreatic duct stent, pancreatic deep wire pass, and development of pain during the procedure (25-28). In our study, the main risk factors for

complications were: invasive techniques in clearance of CBD calculi, and pancreatic injection. Of these factors, the pancreatic injection was directly related to the development of Pancreatitis. The placement of pancreatic stent can be used to reduce the risk of Pancreatitis. Showed the efficacy of pancreatic duct stent (PDS) placement for the prevention of pancreatitis; they found a pooled relative risk of 0.39 for the effective PDS as a preventive measure against pancreatitis (29). Showed that the early pre-cut strategy when facing a possible difficult biliary cannulation could reduce pancreatitis incidence (30).

Many limitations of the study need to be highlighted. One of these is the fact that we have conducted the study on a narrow sample because the sample size was drawn from a single center. The European Gaza Hospital is one of only two centers in the Gaza Strip doing ERCP. Patients are referred from healthcare units to these two centers; therefore, post-op follows up is not well established for many patients. Other limitations of our study include the documentation process of cases that underwent an ERCP; for example, we could not find the exact number of cannulations attempts and pancreatic injection times. Future studies with larger samples drawn are needed to support the findings.

#### Conclusions

ERCP is a valuable procedure in the treatment of a variety of pancreaticobiliary diseases, and recently it is one of the most technically demanding procedures in gastroenterology. Despite the development of the technology and equipment of ERCP in recent years, the incidence of adverse events and complications after ERCP has not decreased significantly. Choledocholithiasis was the most common indication for doing ERCP. Clearance of CBD calculi was the most common therapeutic endoscopic intervention applied during ERCP, with sphincterotomy was the common technique done. The total rate of complications in this study was 6.8%, The most common complications were bleeding, followed by pancreatitis. Invasive techniques of CBD clearance and pancreatic injection were more common in patients with post-ERCP complications.

#### References

1. Freeman ML (2012) Current status of endoscopic stenting of the pancreatic duct as prophylaxis against post-ERCP pancreatitis. *Gastroenterol Hepatol*, 8: 618-620.
2. Jeurnink SM, Siersema PD, Steyerberg EW, Dees J, Poley JW, et al. (2011) Predictors of complications after endoscopic retrograde cholangiopancreatography: a prognostic model for early discharge. *Surg Endo*, 25: 2892-2900.
3. Cotton PB, Garrow DA, Gallagher J, Romagnuolo J (2009) Risk factors for complications after ERCP: a multivariate analysis of 11,497 procedures over 12 years. *Gastro Endo*, 70: 80-88.
4. Rustagi T and Jamidar PA (2015) Endoscopic retrograde cholangiopancreatography related adverse events: general overview. *Gastrointest Endosc Clin N Am*, 25: 97-106.
5. P B Cotton, G Lehman, J Vennes, J E Geenen, R C Russell, et al. (1991) Endoscopic sphincterotomy complications and their management: an attempt at consensus. *Gastrointest Endosc*, 37: 383-393.
6. Mohammad Alizadeh AH, Afzali ES, Behzad C, Mousavi M, Mirsattari D, et al. (2015) Is ESR Important for Predicting Post-ERCP Pancreatitis? *Clinical Medicine Insights Gastroenterology*, 8: 23-27.
7. Muller AF (2013) Endoscopic retrograde cholangiopancreatography: is the centre better? The case against centralisation of ERCP services. *Frontline Gastroenterology*, 4: 210-212.
8. Huang LY, Liu YX, Wu CR, Cui J, Zhang B (2009) Application of endoscopic retrograde cholangiopancreatography in biliary-pancreatic diseases. *Chinese Medical Journal*, 122: 2967-2972.
9. Rogers SJ, Cello JP, Horn JK, Siperstein AE, Schecter WP, et al. (2010) Prospective randomized trial of LC+LCBDE vs ERCP/S+LC for common bile duct stone disease. *Archives of surgery*, 145: 28-33.
10. Salman B, Yilmaz U, Kerem M, Bedirli A, Sare M, et al. (2009) The timing of laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography in cholelithiasis coexisting with choledocholithiasis. *Journal of Hepato-Biliary-Pancreatic Surgery*, 16: 832-836.
11. Todd H Baron, Bret T Petersen, Klaus Mergener, Amitabh Chak, Jonathan Cohen, et al. (2006) Quality indicators for endoscopic retrograde cholangiopancreatography. *Gastrointestinal Endoscopy*, 63: 29-34.
12. Tanaka K and Kida M (2009) Role of endoscopy in screening of early pancreatic cancer and bile duct cancer. *Digestive endoscopy: official journal of the Japan Gastroenterological Endoscopy Society*, 21: 97-100.
13. Loperfido S, Angelini G, Benedetti G, Chilovi F, Costan F, et al. (1998) Major early complications from diagnostic and therapeutic ERCP: a prospective multicenter study. *Gastrointestinal Endoscopy*, 48: 1-10.
14. Christensen M, Matzen P, Schulze S, Rosenberg J (2004) Complications of ERCP: a prospective study. *Gastrointestinal Endoscopy*, 60: 721-731.
15. Siiki A, Tamminen A, Tomminen T, Kuusanmaki P (2012) ERCP procedures in a Finnish community hospital: a retrospective analysis of 1207 cases. *Scandinavian journal of surgery: SJS: Official organ for the Finnish Surgical Society and the Scandinavian Surgical Society*, 101: 45-50.
16. Penalzoza-Ramirez A, Leal-Buitrago C, Rodriguez-Hernandez A (2009) Adverse events of ERCP at San Jose Hospital of Bogota (Colombia). *Revista espanola de enfermedades digestivas : organo oficial de la Sociedad Espanola de Patologia Digestiva*, 101: 837-849.
17. Nam HS and Kang DH (2016) Current Status of Biliary Metal Stents. *Clinical endoscopy*, 49: 124-130.
18. Williams EJ, Taylor S, Fairclough P, Hamlyn A, Logan RF, et al. (2007) Risk factors for complication following ERCP; results of a large-scale, prospective multicenter study. *Endoscopy*, 39: 793-801.
19. Cheng CL, Sherman S, Watkins JL (2006) Risk factors for post-ERCP pancreatitis: A prospective multicenter study. *The American Journal of Gastroenterology*, 101: 139-147.
20. Jian Jun Chen, Xi Mo Wang, Xing-Qiang Liu, Wen Li, Mo Dong, et al. (2014) Risk factors for post-ERCP pancreatitis: a systematic review of clinical trials with a large sample size in the past 10 years. *Eur J Med Res*, 19: 26.
21. Kochar B, Akshintala VS, Afghani E, Elmunzer BJ, Kim KJ, et al. (2015) Incidence, severity, and mortality of post-ER-

- 
- CP pancreatitis: A systematic review by using randomized, controlled trials. *Gastrointestinal Endoscopy*, 81: 143-149.
22. Enns R, Eloubeidi MA, Mergener K, Jowell PS, Branch MS, et al. (2002) ERCP-related perforations: risk factors and management. *Endoscopy*, 34: 293-298.
  23. Nayab D, Akhtar SA, Rehman S, Habib H (2018) Frequency of early post-ercp adverse events in both diagnostic and therapeutic procedures. *Gomal J Med Sci*, 16: 43-45.
  24. Gurung RB, Purbey B, Koju R, Bedi TRS (2014) Endoscopic Retrograde Pancreato Cholangiography (ERCP) at Dhulikhel hospital: Outcome Analysis. *Kathmandu Univ Med J*, 45: 55-59.
  25. Vandervoort J, Soetikno RM, Tham TC, Wong RC, Ferrari AP, et al. (2002) Risk factors for complications after performance of ERCP. *Gastrointestinal Endoscopy*, 56: 652-656.
  26. Wang P, Li ZS, Liu F, Ren X, Lu NH, et al. (2009) Risk factors for ERCP-related complications: a prospective multicenter study. *The American Journal of Gastroenterology*, 104: 31-40.
  27. Li GZ, Wang F, Fang J, Zha HL, Zhao Q (2018) Risk Factors for Post-Endoscopic Retrograde Cholangiopancreatography Pancreatitis: Evidence from 1786 Cases. *Medical science monitor: International Medical Journal of Experimental and Clinical Research*, 24: 8544-8552.
  28. Cooper ST and Slivka A (2007) Incidence, risk factors, and prevention of post-ERCP pancreatitis. *Gastroenterology Clinics of North America*, 36: 259-276.
  29. Mazaki T, Mado K, Masuda H, Shiono M (2014) Prophylactic pancreatic stent placement and post-ERCP pancreatitis: An updated meta-analysis. *Journal of Gastroenterology*, 49: 343-355.
  30. Cennamo V, Fuccio L, Repici A, Fabbri C, Grilli D, et al. (2009) Timing of precut procedure does not influence success rate and complications of ERCP procedure: a prospective randomized comparative study. *Gastrointestinal Endoscopy*, 69: 473-479.

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