

EFFICACY OF ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY FOR CHOLEDOCHOLITHIASIS

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ABSTRACT

Objective: To determine the efficacy of endoscopic retrograde cholangiopancreatography (ERCP) for choledocholithiasis.

Material and Methods: This was a descriptive case series study conducted at Surgical A Unit, Medical Training Institute, Hayatabad Medical Complex, Peshawar, Pakistan in which a total of 127 patients were observed. All patients with CBD stones were scheduled for ERCP. Both genders (male & females) and adult age group (above 18 years) were included. All subjects were subjected to complete history and clinical examination. ERCP was performed under sedation using propofol and antibiotic prophylaxis. Patients with no complications after 5 hours of admission were discharged from the hospital. All ERCPs were performed by single experienced gastroenterologist having 7 years of experience. All patients were followed up on 3rd post operative day and a repeat ultrasound (U/S) was done to confirm stone clearance in CBD. Frequencies and percentages were calculated for categorical variables like gender and efficacy. Efficacy of ERCP was stratified among age and gender to see the effect modifications using chi square test. P value ≤ 0.05 was considered significant in all analyses.

Results: A total of 127 patients were included in this study. Mean age was 42 years with SD ± 2.716 . Thirty eight percent patients were male while (62%) patients were female. ERCP was effective in 104 (82%) patients. No statistical difference of efficacy was found with age and gender as the p value was (0.91, 0.74 respectively).

Conclusion: Our study concludes that endoscopic retrograde cholangiopancreatography was 82% effective for choledocholithiasis.

Key Words: Efficacy, endoscopic retrograde cholangiopancreatography, choledocholithiasis.

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INTRODUCTION

Gallstone disease accounts for the most common biliary tract disease throughout the world. It accounts to almost 12% of the population in United States and 18.5% in the Europe¹. Majority of patients harboring gallstones though asymptomatic still carry a risk of developing complications (1-2%)². Laparoscopic cholecystectomy (LC), regarded the gold standard, being a very common modality of treatment is undergoing rapid

improvement with the advent of newer technologies^{3,4}. The most common complication associated with gall bladder stone is common bile duct (CBD) stone. CBD stones are reported in 10% to 15% of patients in these conditions. It is seen more commonly in advanced ages, especially in those older than 50 years old⁵.

Endoscopic retrograde cholangiopancreatography (ERCP) is a commonly used surgical diagnostic and treatment procedure for pathologies in the pancreatico-biliary tree. In USA alone, 0.5 million ERCP procedures are performed each year⁶. ERCP is associated with complications including pancreatitis, cholangitis, perforation and hemorrhage⁷.

Endoscopic techniques could be used for stone extraction in suspected bile duct stones^{8,9}. Laparoscopic cholecystectomy (LC) was the gold standard treatment for gallstones. ERCP is now considered optimal for

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isolated CBD stones. Moreover, no consensus exists regarding cholecysto-choledocholithiasis (CCL).

The European Association for Endoscopic Surgery published the comprehensive guidelines of minimally invasive approaches in 2006. However, there is no robust statements regarding the best treatment for CCL¹⁰.

In one study, unsuccessful CBD stone clearance after ERCP was recorded in 2.3% of cases⁹. In another study, 94.4% of patients had successful ERCP in terms of complete clearance of CBD stones¹¹. In another study after subjecting patients to ERCP, the bile duct clearance rate was 87% in cirrhotic patients versus 96% in non-cirrhotic patients¹². However, in another study by Bansal BK et al, the successful stone clearance for CBD stones after ERCP was recorded in 79.8% of patients¹³.

CBD stones are not uncommon in our population and as mentioned above, ERCP is now preferred procedure among gastro-enterologists before deciding for more invasive procedures. Although research studies have been conducted in the literature regarding the efficacy and safety of ERCP but the statistics slightly vary from one center to another. Moreover, locally the studies on ERCP efficacy in terms of CBD stone clearance are very limited and there is an urgent need to generate local statistics about the efficacy of ERCP in terms of stone clearance for CBD stones. The result of this study will be used as first hand evidence in generating future research recommendations and for the guidelines in the treatment of CBD stone through ERCP.

MATERIAL AND METHODS

This study was conducted at Department of Surgery, Hayatabad Medical Complex, Peshawar, Pakistan for the duration of one year from June 2015 to June 2016. It was a descriptive case series study in which a total of 127 patients were observed by using 79.8% proportion of efficacy of ERCP for CBD stone clearance¹³ with 95% confidence interval and 7% margin of error using World Health Organization (WHO) sample size calculator. Moreover, in all patients CBD stones schedules for ERCP, both genders (male and females) and adult age group 18-60 years were included. While Patients with pre-operative signs of pancreatitis as detected by clinical examination and serum amylase levels and patients with history of surgery on biliary or pancreatic systems were excluded. After the approval from hospitals ethical and research committee. All adult subjects (as per inclusion criteria) was enrolled in the study through OPD. All subjects were subjected to complete history and clinical examination. ERCP was performed under conscious sedation or propofol where needed. In addition, antibiotic prophylaxis with ceftriax-

one 1 gm intravenous (I/V) was used. All patients were discharged after 5 hours, if there are no complications. All the ERCPs were performed by single experienced gastroenterologist having minimum of 7 years of experience. All patients were followed up on 3rd post operative day and a repeat US was done to confirm stone clearance in CBD. All the above mentioned information including name, age and gender were recorded in a pre designed proforma. Data was analyzed in SPSS version 22. Mean \pm SD was calculated for age while frequencies and percentages were calculated for categorical variables like gender and efficacy. Efficacy of ERCP was stratified among age and gender to see the effect modifications using chi square test with p value of ≤ 0.05 as significant.

RESULTS

In this study a total of 127 patients were observed in which 13 (10%) patients were in age range 20-30 years, 42 (33%) patients were in age range 31-40 years, 44 (35%) patients were in age range 41-50 years, 28 (22%) patients were in age range 51-60 years. Mean age was 42 years with SD ± 2.71 (Table 1). Forty eight (38%) patients were male while 79 (62%) patients were female (Table 2). ERCP was effective in 104 (82%) patients (Table 3). No statistical difference of efficacy was found with age and gender as the p value was (0.91, 0.74 respectively).

Table 1: Age Distribution of patients included in the study

Age	Frequency Percentage
20-30 years	13 (10%)
31-40 years	42 (33%)
41-50 years	44 (35%)
51-60 years	28 (22%)
Total	127 (100%)

Table 2: Gender Distribution of patients included in the study

Gender	Frequency Percentage
Male	48 (38%)
Female	79 (62%)
Total	127 (100%)

Table 3: Efficacy of ERCP

Efficacy	Frequency
Effective	104 (82%)
Not effective	23 (18%)
Total	127 (100%)

Table 4: Stratification of Efficacy of ERCP in relation to age distribution

Efficacy	20-30 years	31-40 years	41-50 years	51-60 years	Total
Effective	10	34	36	24	104
Not effective	3	8	8	4	23
Total	13	42	44	28	127

Chi square test was applied in which P value was 0.9150

Table 5: Stratification of Efficacy of ERCP with respect to gender distribution

Efficacy	Male	Female	Total
Effective	40	64	104
Not effective	8	15	23
Total	48	79	127

Chi square test was applied in which P value was 0.7419

DISCUSSION

Endoscopic retrograde cholangiopancreatography (ERCP) is a widely used procedure for upper gastrointestinal lesions and especially as a diagnostic and management tool for pancreatobiliary tree⁶. However, it is also associated with complications⁷.

Our study shows that among 127 patients, 10% patients were in age range 20-30 years, 33% patients were in age range 31-40 years, 35% patients were in age range 41-50 years, 22% patients were in age range 51-60 years. Mean age was 42 years with SD \pm 2.716. Thirty eight percent patients were male while 79 (62%) patients were female. ERCP was effective in 104 (82%) patients. No statistical difference of efficacy was found with age and gender as the p value was (0.91, 0.74 respectively).

Similar results were observed by Tantau M et al⁹ in which unsuccessful CBD stone clearance after ERCP was recorded in 2.3% of cases. Similar results were observed in another study conducted by Koc B et al¹¹ in which 94.4% of patients had successful ERCP in terms of complete clearance of CBD stones. In another study after subjecting patients to ERCP, the bile duct clearance rate was 87% in cirrhotic patients versus 96% in non-cirrhotic patients¹². However, in another study by Bansal BK et al, the successful stone clearance for CBD stones after ERCP was recorded in 79.8% of patients¹³.

Similar results were observed by Lynn AP et al¹⁴ in which the median age of the 41 patients (16 male, 25 female) was 42 years (range: 18-82 years). Sixteen surgeons performed the operations with a median delay of 6 days (range: 1-103 days) between cholecystectomy and postoperative ERCP. Common bile duct access was achieved in 100% of the patients, with ERCP taking a

median time of 16 minutes (range: 6-40 minutes). Initial ERCP confirmed the presence of a stone in 30 patients (73%) and successful stone removal occurred in 28 of these 30 patients (93%) during the first ERCP and in the remaining 2 on a subsequent ERCP. Following ERCP, two patients (4.9%) experienced extended hospital stays for four and eight days owing to complications, including one patient (2.4%) with mild acute pancreatitis.

Kelly MD¹⁵ had reported that there is also significant risk as evidenced by a consecutive series of 56 intraoperative choledochotomies from the UK. The success rate for clearance of the duct was 93% but 11% experienced major morbidity. Half of these required repeat laparoscopy and one patient (2%) required conversion to open surgery. Similar results were also observed in other studies done by Fisher L,¹⁶ Freeman ML,¹⁷ Cheng CL,¹⁸ Anderson MA,¹⁹ Andriulli A.²⁰

CONCLUSION

Our study concludes that endoscopic retrograde cholangiopancreatography was very effective for choledocholithiasis.

REFERENCES

1. Ruhl CE, Everhart JE. Gallstone disease is associated with increased mortality in the United States. *Gastroenterology* 2011;140(2):508-16.
2. Duncan CB, Riall TS. Evidence-based current surgical practice: calculous gallbladder disease. *J Gastroenterol Surg* 2012;16(11):2011-25.
3. Broderick RC, Omelanczuk P, Harnsberger CR, Fuchs HF, Berducci M, Nefa J, Nicolai J, et al. Laparoscopic cholecystectomy using a novel single-incision surgical platform through a standard 15mm trocar: initial experience and technical details. *Surgical endoscopy*. 2015;29(5):1250-56.
4. Pan MX, Jiang ZS, Cheng Y, Xu XP, Zhang Z, Qin JS, et al. Single-incision vs three-port laparoscopic cholecystectomy: prospective randomized study. *World J Gastroenterol*. 2013;19(3):394-98.
5. Cotter JD, Magalhães J, Rosa B. Endoscopic retrograde cholangiopancreatography for suspected choledocholithiasis: from guidelines to clinical practice. *World J Gastro End*. 2014;16(7):128-34.
6. Gahagan JV, Maximus S, Whealon MD, Phelan MJ, Demirjian A, Joe VC. Analysis of Endoscopic Retrograde Cholangiopancreatography after Positive Intraoperative Cholangiogram: Is It Necessary?. *The American Surgeon*. 2016;82(10):985-88.

7. Glomsaker T, Hoff G, Kvaløy JT, Søreide K, Aabakken L, Søreide JA. Patterns and predictive factors of complications after endoscopic retrograde cholangiopancreatography. *BJS* 2013;100(3):373-80.
8. Siiki A, Tamminen A, Tomminen T, Kuusanmäki P. ERCP procedures in a Finnish community hospital: a retrospective analysis of 1207 cases. *Scand J Surg* 2012;101:45-50.
9. Tantau M, Mercea V, Crisan D, Tantau A, Mester G, Vesa S, et al. ERCP on a cohort of 2,986 patients with cholelithiasis: a 10-year experience of a single center. *J Gastrointest Liver Dis.* 2013;22(2):141-47.
10. Duncan CB, Riall TS. Evidence-based current surgical practice: calculous gallbladder disease. *J Gastrointest Surg.* 2012;16(11):2011-25.
11. Koc B, Karahan S, Adas G, Tural F, Guven H, Ozsoy A. Comparison of laparoscopic common bile duct exploration and endoscopic retrograde cholangiopancreatography plus laparoscopic cholecystectomy for choledocholithiasis: a prospective randomized study. *Am J Surg* 2013;206(4):457-63.
12. Li DM, Zhao J, Zhao Q, Qin H, Wang B, Li RX, et al. Safety and efficacy of endoscopic retrograde cholangiopancreatography for common bile duct stones in liver cirrhotic patients. *J Huaz Univ Sci Tech* 2014;34:612-15.
13. Bansal BK, Misra MC, Rajan K, Kilambi R, Kumar S, Krishna A, et al. Single-stage laparoscopic common bile duct exploration and cholecystectomy versus two-stage endoscopic stone extraction followed by laparoscopic cholecystectomy for patients with concomitant gallbladder stones and common bile duct stones: a randomised controlled trial. *Surg Endosc* 2014;28(3):875-85.
14. Lynn AP, Chong G, and A Thomson A. Endoscopic retrograde cholangiopancreatography in the treatment of intraoperatively demonstrated choledocholithiasis. *Ann R Coll Surg Engl.* 2014 Jan; 96(1): 45-48.
15. Kelly MD. Results of laparoscopic bile duct exploration via choledochotomy. *ANZ J Surg* 2010; : 694-98.
16. Fisher L, Fisher A, Thomson A. Cardiopulmonary complications of ERCP in older patients. *Gastrointest Endosc* 2006; 948-55.
17. Freeman ML, DiSario JA, Nelson DB. Risk factors for post-ERCP pancreatitis: a prospective, multicenter study. *Gastrointest Endosc* 2001;425-34.
18. Cheng CL, Sherman S, Watkins JL. Risk factors for post-ERCP pancreatitis: a prospective multicenter study. *Am J Gastroenterol* 2006;139-47.
19. Anderson MA, Fisher L, Jain R.. Complications of ERCP. *Gastrointest Endosc* 2012; 467-73.
20. Andriulli A, Loperfido S, Napolitano G. Incidence rates of post-ERCP complications: a systematic survey of prospective studies. *Am J Gastroenterol* 2007; 781-88.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Ahmad M:	Planned the Study, Manuscript writing
Ali A:	Planning study, Manuscript writing, Revision
Khan F:	Statistical analysis.
Khan M:	Data Collection.
Khan S:	Compilation of Results.
Faridoon S:	Bibliography.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.