ENDOSCOPIC MANAGEMENT OF COMMON BILE DUCT STONES EXPERIENCE AT MILITARY HOSPITAL, RAWALPINDI

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ABSTRACT

Objective: To determine the characteristics of patients presenting with common bile duct (CBD) stones, to know the type of endoscopic therapy employed and to see procedure related complications.

Study design: A descriptive study

Palace and Duration of Study: The study was conducted in the Department of Gastroenterology of Military Hospital , Rawalpindi from Jan 2007 to Dec 2007.

Methods: Adult patients with common bile duct stones who underwent endoscopic retrograde cholangiopancreatography (ERCP) enrolled in a consecutive manner. The procedure was done under sedation with midazolam and meperidine after informed and written consent. Patients data was obtained from the department and entered on a spread sheet to calculate percentages and frequencies .The data was analyzed using Statistical Package for Social Sciences (SPSS) version 10 to document the endoscopic procedures done and the procedure- related complications.

Results: Two hundred and twenty five patients underwent ERCP for evaluation and treatment of CBD stones. Mean age was 45 years with female to male ratio of 1.9 : 1. Out of 225 patients, cannulation failed in 4 cases due to duodenal stenosis and 154 (70 %) out of 221 cases of CBD stones mandated endoscopic treatment with balloon trail, basket extraction, placement of plastic biliary stent temporarily or use of mechanical lithotriptor. Duct clearance was achieved in 67 % cases. Complication rate has been 9 % with bleeding being the most common complication with no mortality.

Conclusion: A duct clearance rate of over 67 % was achieved with sphincterotomy combined with balloon trail, basket extraction and lithotripsy. Bleeding was the most common procedure- related complication. Very large CBD stones/ Mirrizi syndrome cases were referred for surgical intervention.

Key Words: Common bile duct stones. Endoscopic treatment. Complications.

INTRODUCTION

Common bile duct stones occur in 15 to 20 percent cases of cholelithiasis[1]. However, some patients may have apparently normal gallbladder and stones may form primarily in the CBD. Stones in common bile duct are now manageable by endoscopic procedures like sphincterotomy with balloon trail, basket extraction or both or stenting and mechanical / laser lithotripsy .Diagnostic ERCP is a prerequisite[2,3] before using any endoscopic therapeutic option. Choice of option depends upon the size of duct, site, size and number of stones. Complications associated with endoscopic treatment of CBD stones include bleeding, pancreatitis, cholangitis[4], perforation and stone or basket impaction. The objective of this study was to see patients` characteristics , to know the type of endoscopic therapy employed and to see the procedure related complications .

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PATIENTS AND METHODS

This descriptive study was carried out at the Military Hospital Rawalpindi from January 2007 to December 2007. Adult patients with either confirmed or suspected CBD stones were enrolled in the study . Patients were booked for ERCP in a consecutive manner. Patients' data was obtained from the department records which is maintained in the form of books. Each book page gave an account of each patient`s profile, indication for the procedure, abdominal ultasound findings, findings on ERCP,

therapeutic procedures done , any procedure-related complications and any advice for further evaluation. The data of each patient was entered on a spread sheet and categorized to calculate percentages and frequencies. Pre-requisites for ERCP were informed written consent, stable cardiopulmonary status, prothrombin time , blood counts, abdominal ultrasound (USG) and liver function tests . Sedation was given with IV 0.08mg/Kg midazolam and 25-100 mg meperidine. Urografin 76 % (Shering) was used in half strength to opacify the bile ducts. To control gut motility, IV hyosine butylbromide was used .Patients were monitored throughout with O2 saturation, pulse and blood pressure readings. Where required , effects of midazolam and meperidine were reversed with flumazenil and naloxone respectively either during the procedure or at the end. An occulsion cholangiogram was done at the end to document duct clearance. Patients were observed for 6 hours post-procedure and when indicated were admitted. TJF160 (Olympus) video duodenoscope, Arcadis Varic C arm (Siemens), ES unit PSD (Olympus) and mechanical lithotriptor BML 110 (Boston Scientific) were used. Accessories included guidewires of different sizes (Boston scientific) , cannulae (Wilson Cook), sphincterotome(Wilson Cook) , needle knife(Boston Scientific), extraction balloon (Wilson Cook) and extraction basket (Mediglobe).Where required, plastic biliary stents (Olympus / Wilson Cook) of various sizes were used as temporary measure .

Data was analyzed using SPSS version 10. and descriptive statistics were used to describe it.

RESULTS

A total of 225 patients underwent ERCP for evaluation & treatment of suspected or confirmed CBD stones. This included 23 post-cholecystectomy and 2 pre-cholecystectomy cases as well. While 147 (65 %) were females, 78 (35 %) were males. Age ranged between 25 to 60 years with a mean age of 45 years. Patients belonged to upper Punjab, khyber Pakhtunkhwah and Kashmir in the order of frequency .Pre-procedure abdominal USG showed CBD stones either alone or in combination with gallbladder (GB) stones in 120 cases (53%), GB stones alone in 64 (28%) cases whereas in 41 (19%) cases there were dilated bile ducts only. Five cases had periampullary diverticulum. Our cannulation rate was 216 out of 220 (98%) since 5 patients had come for review of previous stents and cannulation failed in 4 cases due to duodenal stenosis

At ERCP, 169 cases (76%) including 5 old ones had CBD stones, 12 (5%) had GB stones , 8 (4%) had CD stones, 7 (3%) had CBD stricture and 10 had (5 %) dilated biliary ducts only. ERCP was normal in 15 (7 %) cases. (Table-12). Abdominal USG showed GB stones in 64 cases but only 12 cases were reported to have gallbladder stones on ERCP; this is partly because opacification of gallbladder was not the aim in all cases.. The stone size (in mm) was 12-+5.

Out of 169 new and old cases who had CBD stones on ERCP , 154 (91 %) cases were subjected to endoscopic treatment since in 15 (9 %) cases stones were too big to be handled endoscopically. Precut with needle knife had to be given in 8 (5%) out of 154 cases to gain access to CBD. Regular sphinterotomy was done in all cases except old ones. CBD stones were removed with retrieval balloon trail alone in 76(49%) cases , with basket in 38 (25%) cases , with lithotriptor in 4 (3%) cases and stents were left temporarily in 36 (23%) cases. (Table-2) .Previously passed stents for CBD stones were removed due to blockade between 3 to 6 months of placement in 5 cases and duct cleared with balloon trail / basket use. Duct clearance was achieved in 103 (67 %) out of 154 cases; 15 (10%) cases had very large stones mandating surgical removal and 36(23%) had difficult to retrieve stones for which temporary stents were left .

The overall complication rate has been 9 % (14 out of 154 cases). Mild bleeding after sphinterotomy occurred in 6 cases, mild pancreatitis in 4 cases, and mild cholangitis in 2 cases and basket impaction in one case. CBD disruption occurred in one (7%) case (Figure). Those with mild bleeding were managed by

local measures like electro-coagulation, adrenaline injection and balloon tamponade. Mild pancreatitis cases were admitted, managed conservatively and discharged in less than 3 days time. Likewise, patients with cholangitis were admitted and given IV antibiotics and discharged by day 5. Basket impaction was managed endoscopically using mechanical lithotriptor.

A total of 28 (12 %) out of 225 cases were referred to surgical specialist; this included 15 for large stones (>1.5 cm), 8 for Mirrizi syndrome, 4 for cannulation failure and one for duct disruption.

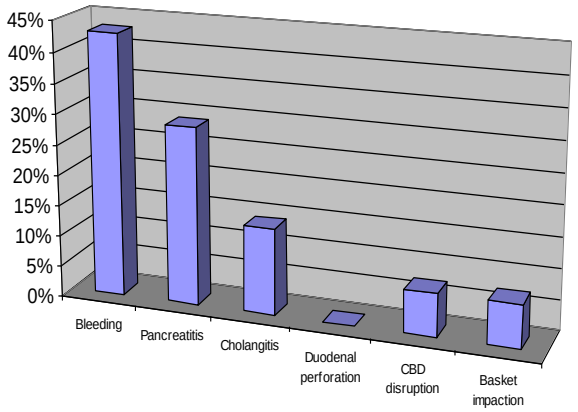

Figure: Early complications of E.R.C.P (n= 14)

Table-1: ERCP findings

Patients	CBD stones	GB stones	CD stones (Mirrizi)	Dilated ducts only	CBD Strictures	Previous Stents & CBD stones	Normal
221	164 (74%)	12 (5%)	8 (4%)	10 (5%)	7 (3%)	5 (2%)	15 (7%)

CBD, common bile duct ; **GB**, gallbladder ; **CD**, cystic duct

Table-2: Endoscopic therapeutic procedures done

Total Patients for therapy	ES+Balloon trail	ES +Basket extraction	ES +Lithotripsy	ES +Temporary Stenting
154	76 (49%)	38 (25%)	4 (3%)	36 (23%)

ES, endoscopic sphincterotomy

DISCUSSION

The ERCP has both diagnostic as well as therapeutic value in the management of CBD stones. Abdominal USG is the investigation of choice for diagnosing GB stones but its sensitivity falls to 30 – 40 % for diagnosing stones in common duct. Endoscopic ultrasound (EUS) can detect common bile duct stones in over 90% cases. However, MRCP has higher (97%) sensitivity and specificity for CBD stones when compared with ERCP[5]. In individuals with normal anatomy, the successful cannulation rate is 95%[6,7]. It was 98 % in our study. When cannulation fails, precut is used to gain access to CBD. We had to use precut technique in only 8 (5%) cases. But use of precut is associated with higher chances of complications like pancreatitis and perforation[8]. Placement of pancreatic stent prior to precut is useful to prevent pancreatitis in difficult cases of bile duct cannulation[9]. When we used precut technique, there was not a single case of pancreatitis after the precut without placing the pancreatic stent before.

Endoscopic sphincterotomy alone is successful in more than 90% cases of retained CBD stones[10] and in remaining 10 % cases other endoscopic procedures have to be employed to remove stones. Following ES, most stones less than 1 cm in size pass spontaneously but in other cases additional endoscopic options have to be used to extract CBD stones. Balloon is used when bile duct is not dilated or there is a single free floating stone. Basket is used when the duct is dilated or there are multiple stones. Sphincterotomy is followed by cholecystectomy to eliminate the source of gallstones as gallbladder –associated disease may recur in 10- 50 % patients[11–13]. We advised cholecystectomy in all cases who underwent sphincterotomy for CBD stones

except in patients who were poor operative candidates.

Very large stones (greater than 1.5 cm) are treated with techniques like (1) mechanical lithotripsy[14,15] (2) laser lithotripsy[16] (3) Extracorporeal shock wave lithotripsy (ESWL) which is done under guidance of a nasobiliary catheter. Where available, ESWL can give duct clearance in difficult to treat bile duct stones in 71% cases[17]. Complications like cholangitis and acute cholecystitis are rare. (4) combined endoscopic papillary large balloon dilatation (EPLBD) after mid- incision ES may be employed especially in patients with anatomical alterations like Billroth II operation; it has an impact comparable to mechanical lithotripsy. EPLBD is safer than regular ES because mini-ES instead of complete ES is performed during the procedure thus reducing the risk of major bleeding and perforation[18].

In cases where stones are not very large but still left behind despite endoscopic measures, a biliary stent is passed or nasobiliary catheter is placed pending definite treatment to avoid stone impaction.at ampulla. We used the option of placing a stent temporarily in cases where stones were not too large but could not be retrieved ; five such cases came back for follow-up between 3 to 6 months after stent placement and duct was cleared after removing stents.

We used only through–the–scope mechanical lithotriptor in 4 cases of large CBD stone. We achieved duct clearance in all cases but otherwise the overall duct clearance rate is 80-90 % although 20- 30 % cases require more than one session[19].

Cases with cystic duct obstruction are at higher risk of acute cholecystitis after ES for CBD stones[20]; we referred such cases for surgical intervention.

In a study[21] at Agha Khan University Hospital, post-cholecystectomy patients with retained CBD stones were analyzed following endoscopic treatment. The study consisted of 66 patients enrolled during the period 1993-2001. Major endoscopic procedure done was ES (92.5%) and duct clearance was achieved in 75% cases. Procedure-related complications reported are 17 (28%) in this study with acute pancreatitis being the leading complication. At our centre, out of 169 cases, 23 post-cholecystectomy patients with retained CBD stones were subjected to ERCP. Our major endoscopic procedure was ES plus trail with retrieval balloon in 16 (70 %) 0ut of 23 cases and duct clearance was achieved in 18 (78 %) out of 23cases. Procedure-related bleeding occurred in one case and cholangitis in another case giving a complication rate of 9 % in this category of patients.

The short-term complication rate in our experience has been less than 10% but bleeding and not pancreatitis has been the most common procedure - related complication. In one report, complication rate was 6 % at seven centres[22] with pancreatitis being the commonest complication . We don't yet have any report of a long-term complication i.e. , stone recurrence, papillary stenosis and cholangitis in our patients. In general , pancreatitis is the most common complication (2-7%) followed by bleeding (1-2%) , perforation (1%) and cholangitis (1%) after ERCP according to a grading system by Cotton et al[23].

EUS is a fast emerging modality which has many diagnostic and therapeutic applications. In the context of CBD stones, it has a diagnostic and palliative value (duct decompression) in cases of challenging post-operative GI anatomy, gastric outlet obstruction and otherwise inaccessible papilla. Transduodenal bile duct decompression has been performed for patients with choledocholithiasis to facilitate stenting[24]. The facility of EUS available with us may be extended to evaluation and treatment of CBD stones in cases of failed / impossible ERCP.

We need to have experience of EPLBD in removing large CBD. The modality of ESWL is being under- utilized for difficult to treat CBD stones.

Conclusion: We achieved a CBD clearance rate of 67 % with ES, balloon trail and or basket extraction and use of a mechanical lithotriptor.

All cases with very large CBD stones were referred to surgeon. Rate of procedure-related complications has been comparable to international standards.

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