

## Original Article

# Success and Limitations of ERCP in the Management of Obstructive Jaundice

Rahman MM<sup>1</sup>, Sharif MSB<sup>2</sup>, Rahman A<sup>3</sup>, Khan MR<sup>4</sup>, Mandal MA<sup>5</sup>

### Abstract

**Background:** Obstructive jaundice can be caused by malignant or benign lesions. The treatment for these conditions is biliary decompression either by surgery or by endoscopic methods. **Objectives:** The aim of this study was to evaluate the diagnostic and therapeutic role of ERCP with its success and limitations in the management of obstructive jaundice. **Methods:** This study was carried out in the department of General Surgery & hepato-biliary surgery in Bangabandhu Sheikh Mujib Medical University during 1st January, 2012 to 30th June, 2012. **Results:** The study included 60 patients (male, 38, female, 22), mean age 45 years (range, 21-70 years). Commonest malignant cause of obstructive jaundice was Carcinoma of the pancreas 27% followed by, cholangiocarcinoma 15%, and periampullary carcinoma 8%. Bile duct stone 32% was the commonest benign cause followed by papillary stenosis 13% and round worm in biliary tree 5%. Stenting were done in 42% of patients and success rate was 92%. Biopsy were taken for diagnosis in 8% for papillary tumours. Stone extraction were done in 32% of patients for CBD stone and success rate was >94%. Warm extraction were done in 5% and sphincterotomy in 11% of patients for papillary stenosis where success rate was 100%. ERCP could not be performed due to stenosis of duodenum in 1.66% of patients, complete papillary obstruction in 3.33%, papillary position abnormality in 3.33% and endoscopically ampulla not found in 5% of patients. The commonest post ERCP complication was acute pancreatitis that was 5%. Other complications include bleeding in 3.33%, perforation in 1.66% and acute cholangitis in 3.33% cases. **Conclusion:** Despite its associated limitations and complication, ERCP is a reliable method in treating obstructive jaundice for most of the benign conditions and stenting as a palliative measure & tissue diagnosis in malignant obstruction. In this study the success rate is acceptable for ERCP in the management of obstructive jaundice.

**Key words:** Obstructive jaundice, ERCP, Carcinoma of the pancreas, Cholangiocarcinoma, Bile duct stone, Stenting.

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### Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) has become the first line approach as a treatment for patients with obstructive jaundice because of its capabilities in diagnosis and treatment. The success rate of ERCP for diagnosis is highly variable ranging from 50% to 96% depending on the operator, endoscopic aspect, disease severity, and anatomical abnormality<sup>1,2</sup>. Despite technological progress, ERCP is associated with several complications, including pancreatitis, hemorrhage, perforation, cholangitis, and cardiopulmonary events in up to 10% of patients with a

mortality rate of 1%<sup>3</sup>. Although endoscopic methods of treatment for biliary obstruction have a significant development in recent years, ERCP has some limitations. Sometimes in patients with previous gastric surgery, oesophageal growth, gastric growth, gastric outlet obstruction or duodenal growth ERCP may not be possible. The purpose of this study was the evaluation of the role of ERCP in the management of obstructive jaundice by studying the success rate of ERCP with its limitations in 60 patients in the department of general surgery and hepatobiliary surgery of BSMMU.

1. Dr. Md. Masudar Rahman, Assistant Professor, Department of Surgery, KYAMCH, Enayetpur, Sirajgonj.

2. Dr. Md. Sayed-Bin-Sharif, Assistant Professor, Department of Surgery, KYAMCH, Enayetpur, Sirajgonj.

3. Dr. Azizur Rahman, Registrar, Department of Surgery, KYAMCH, Enayetpur, Sirajgonj.

4. Dr. Md. Rashed Khan, Assistant Registrar, Department of Surgery, KYAMCH, Enayetpur, Sirajgonj.

5. Dr. Muhammad Alamgir Mandal, Assistant Professor, Department of Physical Medicine, KYAMCH, Enayetpur, Sirajgonj.

## Materials and Methods

This Observational cross sectional study was carried out at general and hepato-biliary surgery department in Bangabandhu Sheikh Mujib Medical University (BSMMU). Six months cross sectional study was carried out from 60 patients selected as convenient and purposive basis. Patients with gastric outlet obstruction/previous gastric surgery and previous diagnostic or therapeutic endoscopic intervention are excluded from this study. Admission criteria, diagnosis, ERCP findings, procedures done during ERCP and post ERCP complications were recorded. The results were compiled in a tabular form and final discussion was drawn.

## Results

During this period sixty patients with obstructive jaundice underwent ERCP. The results of the study derived from data analysis are shown in the following tables and figures. The bulk of the patients were 4th-6th decade and median age was 45 years which are shown in Figure 1.

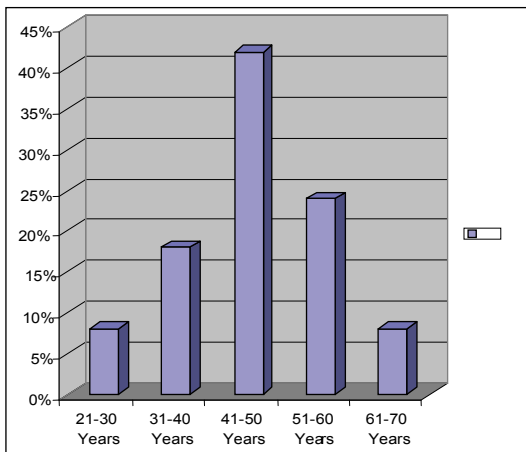


Figure-1: Age distribution of the patient

Among the sixty cases, male cases were 38 (63%) and female 22 (37%) which in figure 2.

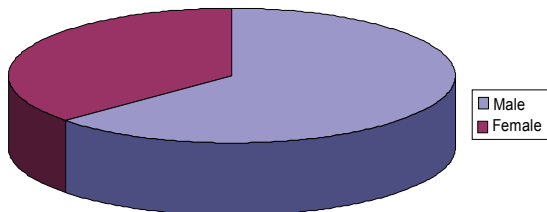


Figure-2: Sex distribution

Table-I: shows stenting were done in maximum cases due to malignancy. Next procedure was stone extraction and biopsy were done in 8% of cases for diagnostic purpose in papillary tumour.

Table-I: Procedure during ERCP

Disease	Procedure	No. of patients (percentage)
Diagnostic Papillary tumour	Biopsy	05(08%)
Therapeutic Pancreatic tumour,	Stenting	16(27%)
Choledochal or biliary duct tumour	Stenting	09(15%)
Bile duct stone	Stone extraction	19(32%)
Round worm in biliary tree	Warm extraction	03(05%)
Papillary stenosis	Sphincterotomy	08(13%)

Success rate in stenting was 92% and in stone extraction > 94%. In other cases success rate was 100%, shown in table II.

Table-II : Success rate of ERCP

Procedure	success	Failed	Success rate
Stenting	23	02	92%
Stone extraction	18	01	94.73%
Warm extraction from CBD	03	00	100%
Sphincterotomy	08	00	100%

Table-III: shows ERCP could not be performed most commonly due to endoscopically ampulla not found. Other limitations were stenosis of duodenum, complete papillary obstruction and papillary position abnormality.

Table-III : Limitations of ERCP

Cause	No. of Patients	Percentage (%)
Stenosis of duodenum	01	1.66%
Complete papillary obstruction	02	3.33%
Papillary position abnormality	02	3.33%
Endoscopically ampulla not found	03	05%

Table IV shows most common post ERCP complication was acute pancreatitis that was 5%. Other complications include bleeding, perforation and acute cholangitis.

Table IV : Complications of ERCP

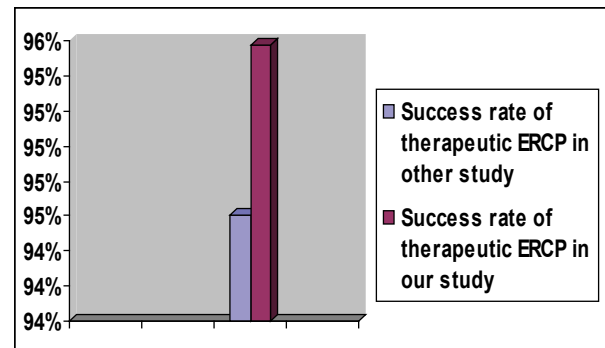
Complication	No. of Patients	Percentage
Acute pancreatitis	03	05%
Bleeding	02	3.33%
Perforation	01	1.66%
Acute cholangitis	02	3.33%

## Discussion

In this study, Obstructive jaundice occurred almost similarly in two genders. In a study, the man to women ratio was 1.14<sup>4</sup>. In this study man to women ratio was 1.70. By the sixth decade, almost 25% of American women develop gallstones, with as many as 50% of women aged 75 years developing gallstones. This increased risk is likely caused by the effect of estrogen on the liver, causing it to remove more cholesterol from the blood and diverting it into the bile<sup>5</sup>.

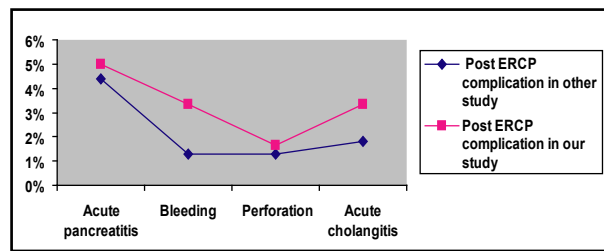
The commonest cause of obstructive jaundice in the present study was neoplasia which was found in 50% of patients. However, CBD stone as the second cause of the disease was found in 32% of patients. In the same study at a referral hospital in Addis Ababa, operative findings showed choledocholithiasis in 41% and malignant conditions in 22% of adult patients with obstructive jaundice as two main causes of the disease<sup>6</sup>. A study showed that 84% and 16% of patients were suffering from malignancy and benign diseases, respectively<sup>7</sup>. In another study the causes of obstructive jaundice were a malignant disease in 30.6% of patients and a benign disease in 69.4% of them<sup>8</sup>. In 25 patients with obstructive jaundice due to malignancy of the pancreas and bile duct stenting was attempted during ERCP and it was technically successful in 23 (92%) patients in the remaining 2 (8%) cases it was not possible. Other study reports the success rate of endoscopic stent placement ranges from 84 to 94%<sup>9</sup>. So the success rate of stenting in this study was consistent with other study. Although ERCP is used successfully in the diagnosis of choledocholithiasis, the question of the best candidate for ERCP is still unresolved. When combined with endoscopic sphincterotomy (ES), ERCP is the most likely primary treatment for choledocholithiasis<sup>10</sup>. Out of 19 patients with stones in bile duct endoscopic stone extraction during ERCP was done successfully in 18 (95%) cases. It failed in 01 (05%) patients, which was managed by surgery. Several series have shown that 85-90 % of common bile duct stones can be effectively removed by ERCP. Ascaris lumbricoids is a common human parasite. In areas where it is endemic, biliary complications are also common<sup>11</sup>. Most of the cases respond to conservative treatment. Those who did not respond to conservative treatment were managed by ERCP. ERCP revealed round worm in biliary tree in 03 patients. Complete clearance of worm was done in all patients. There was

no complication. Papillary stenosis can be caused by passage of stones or scarring after sphincterotomy. It usually results in dilatation of bile duct<sup>12</sup>. Papillary stenosis requires the hole to enlarge by cutting. In our series 05 sphincterotomy were done and there was no immediate complication. The overall success rate of therapeutic ERCP has ranged from 79.6% to 94.6%<sup>13</sup>. This range is similar to our success rate of 95.57%. In diagnostic ERCP success rate was 100%.



**Figure -3:** Shows comparison between success rate of therapeutic ERCP in other study and that of in our study.

The major limitations in ERCP include obstruction due to tumor of the papilla, biliary tract or duodenum, papillary stenosis, papillary location abnormalities and history of a gastrectomy with Billroth II or Roux-en-Y reconstruction<sup>13</sup>. In this study limitations were stenosis of duodenum (01), complete papillary obstruction (02), papillary position abnormality (02) and endoscopically ampulla not found (03). Acute pancreatitis is the most common complication after ERCP, with reported frequencies that range from 0.9% to 4.4%. Predictors of acute pancreatitis include the presence of pancreatic duct catheterization, roentgenography, sphincterotomy or suspected sphincter of Oddi dysfunction<sup>13</sup>. Bleeding risk during ERCP is 0.3%-1.3%, and this rate is even higher with sphincterotomy and in patients undergoing anticoagulant therapy<sup>14</sup>. The risk of perforation during ERCP is 0.3%-1.3%, and, like the risk of bleeding, it is higher with sphincterotomy, stenting. Acute cholangitis is seen in 0.4%-1.8% of ERCP patients and this rate is even higher in patients with incomplete biliary obstruction<sup>15</sup>. In our study complication rate was slightly higher than that of other study because the study was conducted in a training institute where sometimes ERCP was performed by trainee doctors.



**Figure-4:** Shows post ERCP complications in other study and in our study.

The rate of mortality associated with ERCP has been reported at up to 1.0% with a mean of 0.4%<sup>16</sup>. But in our study there was no mortality. In our study we also try to setup a selection criteria for ERCP in the patients with obstructive jaundice on the basis of pre-procedure investigations and their correlation with success rate & complications. In this study, most of the cases stones were small and multiple. In one case it was found a single large stone impacted in proximal common bile duct, that could not be extracted by ERCP. Five cases were diagnosed as papillary tumour. In one of them stenting was attempting but failed. Diabetes mellitus were diagnosed in 3 patients and 2 of them developed post ERCP acute cholangitis. So according to this study the selection criteria for intervention by ERCP in patients with obstructive jaundice are- a)Diagnostic: Diagnostic ERCP can be undertaken safely in patients with papillary tumour. b)Therapeutic: 1. Therapeutic ERCP can be undertaken safely in patients with, Pancreatic & bile duct tumour, small & multiple bile duct stone, biliary ascariasis and Papillary stenosis. 2. Therapeutic ERCP can be considered with either risk of failure or complication in the patients with, diabetes mellitus, papillary tumour and large impacted stone in common bile duct. This selection criteria may not reflect the actual picture, because many other co-morbid diseases and biliarypancreatic conditions that may prohibit successful ERCP were not included in this study due to small sample size. This study was conducted in the referral hospital in which, many patients come with a advanced stage of the diseases and this may affect the outcome of endoscopic intervention. As the stage of malignancy will likely influence success, an early diagnosis and referral is necessary to increase the success rate. We suggest further studies to evaluate the success rate of ERCP in the management of obstructive jaundice. A prospective sampling with larger study group will likely give better conclusion.

## Conclusion

In this study ERCP were done in most of the cases for therapeutic management of obstructive jaundice and success rate is compatible to international studies. Failure in some cases was due to duodenal stenosis and some abnormality of ampulla. Post ERCP complication rate is slightly higher than other study, which may be caused by late referral, different standard instruments and ERCP were sometimes performed by trainee doctors. We also try to setup a selection criteria for intervention by ERCP in the patient with obstructive jaundice to avoid unnecessary ERCP, to increase the success rate and to reduce post ERCP complications. This criteria may not be accurate because of our small sample size. So we recommend a larger research particularly a multi-center research, to evaluate factors that contribute to success rate. Such system may enable us to suggest the patients directly to have appropriate and more likely success procedure.

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