

Limitations and Success Ratio of ERCP in the Treatment of Obstructive Jaundice

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ABSTRACT

Background: Obstructive jaundice can be instigated by benign or malignant lesions. These problems are treated with biliary decompression, which can be done either endoscopically or surgically.

Aim: The aim of the study is to assess the advantages and limitations as well as the therapeutic and diagnostic benefits of ERCP in the treatment of obstructive jaundice.

Methods: This cross-sectional study was held in the Departments of General Surgery, Liaquat University of Medical and Health Science, Jamshoro for one-year duration from January 2022 to December 2022. A total of 70 consecutive patients were included with purposive sampling and with the diagnosis of obstructive jaundice done with ERCP. Patients with prior diagnostic or therapeutic endoscopic intervention or gastric outlet obstruction or prior gastric surgery were excluded from this study. The results are summarized in a table and conclusions are made.

Results: The study included 70 patients (45 males and 25 females) with mean age of 45 years (21-70 years). The most common malignant causes of obstructive jaundice are papillary carcinoma (8.6%), cholangiocarcinoma (17.1%) and pancreatic Carcinoma (27.1%). The most common benign cause was bile duct stone (30%), followed by round warm biliary tree (5.8%) and papillary stenosis (11.4%). 30(93.8%) of patients done with stenting with 92% of success rate. Biopsies were performed to diagnose 8.6% of papillary tumors. 45.7% of patients done with stenting with 93.8% of success rate. In the remaining cases, the success rate was 100%. the most common reason for not performing ERCP; duodenal stenosis in 2.9%, abnormal papillary position in 4.3%, complete papillary obstruction in 4.3% and ampulla was not found endoscopically in 7.1% of subjects. Acute pancreatitis was the most communal complication occurred in 5.7% of cases. Bleeding occurs in 4.3% of cases; 4.3% have acute cholangitis and perforation in 2.9%.

Conclusions: In spite of its complications and limitations, ERCP is a reliable stenting procedure as a palliative and tissue diagnostic tool for blockage due to malignant tumor and in the treatment of obstructive jaundice and most benign diseases. In this study, the effectiveness of ERCP in the treatment of obstructive jaundice is satisfactory.

Keywords: Cholangiocarcinoma, pancreatic carcinoma, ERCP, Obstructive jaundice, and Stenting.

INTRODUCTION

Obstructive jaundice can be instigated by benign or malignant lesions. These problems are treated with biliary decompression, which can be done either endoscopically or surgically¹⁻². Due to advanced capabilities in diagnosis and treatment, endoscopic retrograde cholangiopancreatography (ERCP) has replaced the 1st-line technique in obstructive jaundice patients³⁻⁴. Conferring to the operator knowledge, disease severity, endoscopic aspect and anatomical abnormalities, the diagnostic success rate of ECP varies greatly, from 50% to 96%. Despite advances in technology, ERCP is associated with many problems such as pancreatitis, bleeding, cholangitis, perforation and cardiac events in approximately 10% of subjects, with mortality rate of up to 1%⁵⁻⁶. Though endoscopic techniques of treating biliary obstruction have made substantial progress in current era but there are some limitations of ERCP⁶. Occasionally, ERCP may not be possible for patients who have undergone gastric surgery due to gastric growth, esophageal growth, duodenal growth or gastric outlet obstruction⁷⁻⁸. The aim of the study is to assess the advantages and limitations as well as the therapeutic and diagnostic benefits of ERCP in the treatment of obstructive jaundice.

METHODS

This cross-sectional study was held in the Departments of General Surgery, Liaquat University of Medical and Health Science, Jamshoro for one-year duration from January 2022 to December 2022. A total of 70 consecutive patients were included with purposive sampling and with the diagnosis of obstructive jaundice done with ERCP. Patients with prior diagnostic or therapeutic endoscopic intervention or gastric outlet obstruction or prior gastric surgery were omitted from this study. The following information

was recorded: admission criteria, ERCP findings, diagnosis, ERCP procedures and complications after ERCP. The results are summarized in a table and conclusions are made.

RESULTS

Seventy people with obstructive jaundice don with ERCP. The following figures and tables present the test results obtained by analyzing the data. Figure 1 shows that most patients are in their fourth to sixth decade, with a median age of 45 years.

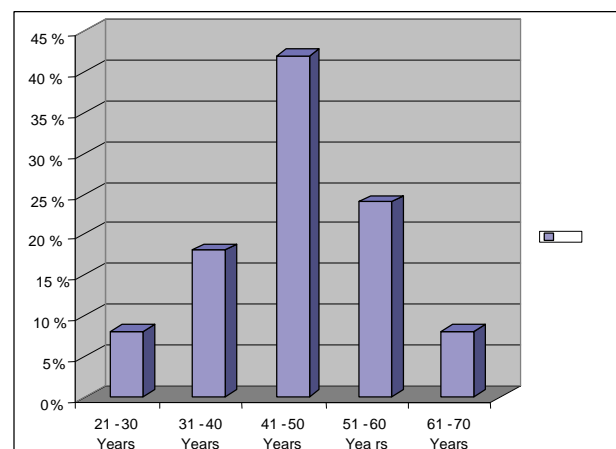


Figure-1: shows the distribution of patients with reference to age-groups

As shown in Table I, the most common malignant causes of obstructive jaundice are papillary carcinoma (8.6%),

cholangiocarcinoma (17.1%) and pancreatic Carcinoma (27.1%). The most common benign cause was bile duct stone (30%), followed by round worm biliary tree (5.8%) and papillary stenosis (11.4%). 30(93.8%) of patients done with stenting with 92% of success rate. Biopsies were performed to diagnose 8.6% of papillary tumors.

Table-1: shows the procedures done during ERCP

Disease	Procedure	No. of patients (percentage)
Diagnostic		
Papillary tumour	Biopsy	6(8.6%)
Therapeutic		
Choledochal or biliary duct tumour	Stenting	12(17.1%)
Pancreatic tumour	Stenting	19(27.1%)
Bile duct stone	Stone extraction	21(30%)
Papillary stenosis	Sphincterotomy	8(11.4%)
Round worm in biliary tree	Warm extraction	4(5.8%)

45.7% of patients done with stenting with 93.8% of success rate. In the remaining cases, the success rate was 100%, as shown in Table II.

Table-2: shows the ERCP success rate

Procedure	Success	Failed	Success rate
Stone extraction	21	2	91.3%
Stenting	30	2	93.8%
Sphincterotomy	5	0	100%
Warm extraction from CBD	10	0	100%

Table III shows that the most common reason for not performing ERCP; duodenal stenosis in 2.9%, abnormal papillary position in 4.3%, complete papillary obstruction in 4.3% and ampulla was not found endoscopically in 7.1% of subjects.

Table-3: shows the ERCP limitations

Cause	No. of Patients	Percentage (%)
Complete papillary obstruction	3	4.3%
Stenosis of duodenum	2	2.9%
Endoscopically ampulla not found	5	7.1%
Papillary position abnormality	3	4.3%

According to Table IV, Acute pancreatitis was the most communal complication occurred in 5.7% of cases. Bleeding occurs in 4.3% of cases; 4.3% have acute cholangitis and perforation in 2.9%.

Table-4: shows the ERCP complications

Complications	No. of Patients	Percentage (%)
Bleeding	3	4.3%
Acute pancreatitis	4	5.7%
Acute cholangitis	3	4.3%
Perforation	2	2.9%

DISCUSSION

In our sample, obstructive jaundice was equally common in both sexes. One study found a M: F of 1.14. The M:F ratio in this study was 1.60. Gallstones develop in more than 25% of American women in their sixth decade of life, and up to 50% of women over the age of 75. Estrogen's effect on the liver causes it to take more cholesterol from the circulation and convert it to the bile, possibly increasing the risk of gallstones. In this study, cancer was diagnosed in 52.8% of patients and was the most common cause of obstructive jaundice. However, 30% of people had CBD stones as the second underlying cause of obstructive jaundice. In one study, the two most common causes of obstructive jaundice in adult patients at the Addis Ababa Reference Hospital were gallstones in 41% of cases and malignancy in 22%⁹⁻¹⁰. According to one study, benign diseases affect 16% of patients, while malignant tumors affect 84% of patients. In another study, 30.6% of patients with obstructive jaundice had malignant condition and

30.6% of the patients had benign mild condition¹¹⁻¹². Biliary stent placement during ERCP in 32 obstructive jaundiced patients due to pancreatic cancer was successful in 30 (93.8%) patients, while remaining 2 (6.2%) patients were not suitable for ERCP. According to other studies, the effectiveness of endoscopic stent implantation ranges from 85-93%. Therefore, the success proportion of stenting was comparable with previous studies. Although ERCP is effective in diagnosing gallstones, the most appropriate candidate for ERCP remains under debate. ERCP along with endoscopic sphincterotomy (ES) is often the first line of management for gallstones¹³⁻¹⁴. According to various studies, ERCP can successfully remove 85 to 90% of gallstones¹⁵. A typical human parasite is *Ascaris lumbricoides* and Bile duct problems are more common in areas where it is endemic. Most cases respond well to conservative treatment. ERCP has been used to treat patients who did not improve after receiving medical treatment¹⁵. The ERCP found roundworms in the biliary tree in three people. The worm infestation in all patients was completely eradicated with no complications. Papillary stenosis may be due to scarring after sphincterotomy and during passage of stones and mostly results in enlargement of the bile ducts. In the case of papillary stenosis, the opening should be made larger by cutting. No complications were observed in our patients done with sphincterotomy¹⁶.

Overall, 79.6% to 94.6% of therapeutic ERCP procedures were successful comparable to this study in which success rate is 91.4%. The effectiveness of diagnostic ERCP was 100%. Significant limitations of ERCP include prior Roux-en-Y reconstruction or gastrectomy with Billroth II, papillary stenosis, atypical nipple location, and obstruction caused by papillary, bile ducts, or duodenal tumor¹⁷. Duodenal stenosis (01), complete papillary obstruction (02), abnormal papilla position (02) and absence of endoscopic alveoli (02) were limitations of this study (03). The most common outcome after ERCP is acute pancreatitis, with rates ranging from 0.9% to 4.4%. Pancreatic duct catheterization, X-ray, sphincterotomy, or the presence of suspected sphincter of Oddi dysfunction are indicators of acute pancreatitis. The risk of bleeding during ERCP varies from 0.4-1.4%, and the risk is even higher in patients who have had a sphincterotomy and are taking anticoagulants¹⁸. The risk of perforation with ERCP ranges from 0.3% to 1.3% and increases with sphincterotomy and stenting. The incidence of acute cholangitis in ERCP patients ranges from 0.4% to 1.8% and is quite high in patients with partial biliary obstruction¹⁹. The complication rate in our study was somewhat greater than in other studies because this study was held in a training hospital where resident physicians sometimes performed ERCP.

Up to 1.0% of deaths attributed to ERCP have been documented with mean of 0.4%. However, no mortality was seen in this study²⁰⁻²¹. In this study, we also attempted to establish a pre-operative criterion for the selection of ERCP in obstructive jaundice patients based on the relationship between success rate and complications. Most of the cases in this study had multiple small stones. In one case, a single large stone was found lodged in the proximal CBD that could not be removed by ERCP. Papillary tumors were detected in six cases. An attempt was made to place a stent in one of them, but no benefit was attained. Diabetes mellitus was identified in three patients and post-ERCP acute cholangitis in two patients. Therefore, conferring to this analysis, the ERCP intervention selection criteria for obstructive jaundice patients are as follows: a) Diagnostic: Patients with papillary tumors can safely undergo diagnostic ERCP. b) Therapeutic: 1. Patients with tumors of the pancreas and bile ducts, single or multiple CBD stone, papillary stenosis and biliary ascariasis may be safely treated with therapeutic ERCP. 2. In diabetics, large retained gallstones and patient with papillary tumors, the therapeutic ERCP carries the risk of morbidity or failure²²⁻²³. These selection criteria may not fully reflect the situation as many additional comorbidities and biliary and pancreatic problems that could prevent successful ERCP due to the small sample size were not considered in this study.²⁴ Early detection and referral are important to increase the

success rate as the stage of the cancer will likely affect the outcome²⁵. We recommend more studies to assess the effectiveness of ERCP in the treatment of obstructive jaundice. A prospective trial with a larger study group is likely to yield a more accurate result.

CONCLUSION

ERCP was used for the treatment of obstructive jaundice in the majority of cases in this study, and the success proportion is in line with data from other countries. In few cases, failure was due to abnormality of ampulla and duodenal stenosis. The complication rate after ERCP is slightly higher than in comparable studies; this can be attributed to late admission and the fact that ERCP and other conventional procedures are sometimes performed by medical students. We tried to establish criteria for the selection of ERCP interventions in patients with obstructive jaundice in order to increase the success rate, avoid unnecessary ERCP and decrease complications after ERCP. Because of the small sample size, this criterion may not be accurate. Therefore, we recommend a larger study, preferably involving more than one center, to assess the factors affecting the success rate. Using such a system, we can directly advise patients on the most appropriate and effective course of treatment.

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