IMPACT OF THE TYPE OF STENTS USED IN EUS-GUIDED HEPATICOGASTROSTOMY ON SHORT TERM OUTCOMES

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Abstract

Background and Aims: Over the past decades, endoscopic retrograde cholangiopancreatography (ERCP) has proven to be the gold standard approach as a therapeutic device for biliary obstruction in both benign and malignant stricture. Since ERCP is not always successful and has failed in multiple occasions another salvage therapy was developed and recently endoscopic ultrasound (EUS)-guided hepaticogastrostomy (HGS) has been showing remarkable results in these settings. The current prospective study aims to assess the impact of types of the stents used in EUS-HGS in patients with malignant biliary obstruction on the short-term outcomes.

Methods: This study was a randomized controlled study carried out at Mansoura Specialized hospital. Patients with distal malignant biliary obstruction undergoing EUS-HGS were randomized into two groups. Group A underwent plastic stent insertion, Group B underwent metallic stent insertion namely the half to half stent. The primary outcomes included rate of complications of EUS-HGS between the two groups (metallic versus plastic stents) while the secondary outcomes included success rates and stent patency.

Results: We enrolled 14 patients in our study. These patients were randomized into two groups. 7 patients had metallic stent and 7 patients had plastic stent. No statistically significant difference was detected regarding success or complications between the two groups.

Conclusions: Both metallic and plastic stents are suitable options for patients with distal malignant biliary obstruction in EUS-HGS with similar success rates and safety profile.

Keywords: EUS; EUS-HGS; Stents, Biliary

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1. INTRODUCTION

One of the commonly encountered clinical problems that the gastroenterologist faces is obstructive jaundice [1]. Obstructive jaundice has numerous benign and malignant causes [2, 3]. In a previous Egyptian study assessing the prevalence and incidence of malignant biliary strictures, nearly 3/4 of the patients had malignant etiology [4].

Unfortunately, the majority of these patients present at advanced stage with metastatic deposits and thus not fit for surgery [5]. Achieving biliary drainage (BD) either via endoscopic or percutaneous route is the modality of choice to bypass the obstruction in these cases [6].

Over the past decades, endoscopic retrograde cholangiopancreatography (ERCP) has proven to be the gold standard approach as a therapeutic device for biliary obstruction in both benign and malignant strictures [7-9]. Since ERCP is not always successful and has failed in multiple occasions another salvage therapy was developed and recently endoscopic ultrasound (EUS)-guided hepaticogastrostomy (HGS) has been showing remarkable results in these settings [10-12].

When it was first introduced, endoscopists used plastic stents to perform EUS-HGS. Despite their ease of use and low cost, plastic stents are of small caliber and thus are liable to being easily obstructed in addition to high risk of bile leak as they cannot self-expand [13]. Hence, in order to overcome the problem of bile leak, conventional biliary-covered self-expendable metallic stents (SEMS) 6 or 8 cm in length were chosen assuming that being self-expandable and having larger caliber will enable these stents to fill in the created fistula without

being obstructed and thus prolonged stent patency [14].

Nevertheless, these covered SEMS had a potentially life-threatening complication of stent migration at the gastric side intraperitoneally with subsequent biliary peritonitis. That is why at first some endoscopists preferred using plastic stents and replacing them with a covered SEMS only after the fistulous tract matures [15].

Herein, we review the impact of the type of EUS-HGS stents in patients with distal malignant biliary obstruction on short term outcomes in a single Egyptian Center.

2. PATIENTS AND METHODS

Patients

This is a randomized controlled study of patients who underwent EUS-HGS for malignant biliary obstruction (MBO) in the duration between May 2021 and May 2022. The study was conducted at the Gastroenterology department at Specialized Medical Hospital at Mansoura University. A total of 14 patients with distant malignant biliary obstruction undergoing EUS-HGS were enrolled in our study. Inclusion criteria were patients older than 18 years and distal malignant biliary obstruction after ERCP failure. Exclusion criteria included patients younger than 18 years, patients with proximal hilar obstruction, presence of severe bleeding tendency, or severe comorbidities. Data included patients' baseline demographics, site and features of malignant stricture, cause of ERCP failure, stent type, procedure duration, procedure success, complications and stent patency. The minimum duration of follow-up for the included patients was one month.

This study protocol was reviewed and approved by the institutional review board of Mansoura faculty of Medicine (IRB). The study was conducted in accordance with the Declaration of Helsinki and the consolidated Good Clinical Practice guidelines. Informed written consent was obtained from all participants after simple explanations of the benefits, details, and possible complications of the planned procedure.

Procedures

EUS-HGS procedures were done by an expert in diagnostic and interventional EUS. The tip of the endoscopy was applied against the lesser curvature till identification of dilated left hepatic duct (in segments II or III). After which and under fluoroscopic guidance, the chosen duct was punctured, dilated and then the guidewire was advanced through the tract and negotiated then afterwards the stent was deployed and its site confirmed via fluoroscopy.

Outcomes

The primary outcome of the study was the difference in the complications between the two groups. Secondary outcomes included the success rates and stent patency comparison between both groups.

Statistical analysis:

Categorical variables were expressed as group percentages and were compared for independent samples using Chi-square test. Continuous data were presented as medians (interquartile range, IQR) and were compared using Wilcoxon's signed ranks test. The statistical significance level was set at <0.05. Statistical analyses were performed using SPSS version 25.

3. RESULTS

In the study duration, 14 patients were included in the study: 9 males (64.3%), and 5 females (35.7%). Their median age was 62.4 years. Pancreatic cancer was the commonest cause of biliary obstruction in these patients followed by cholangiocarcinoma.

All cases had a previous trial of failed ERCP. The most common cause of failure was due to inability to achieve deep cannulation followed by duodenal infiltration, gastric outlet obstruction, and altered anatomy.

Table (1): Baseline characteristics and cause of biliary obstruction

Variable	n (%)/ Median (IQR)
Age (years)	62.4 (55-70)
Sex	
Males	9 (64.3%)
Females	5 (35.7%)
Preprocedural total bilirubin (mg/dl)	18.4 (12-28)
Preprocedural direct bilirubin (mg/dl)	15.6 (9.83-17.5)
Cause of biliary obstruction	
Cancer Pancreas	9 (64.3%)
Cholangiocarcinoma	4 (28.6%)
Other	1 (7.14%)

Procedure success was achieved in all patients. Successful bilirubin drop was achieved in 12 of the 14 patients with only one clinical failure in the metallic group and one failure in the plastic group.

complications were infrequent in our study. With only 5 patients reporting adverse events 1 of them had migrated stent that was successfully managed.

4. DISCUSSION

Despite the steady improvement in diagnostic procedures, patients with MBO are usually diagnosed at advanced stages requiring palliative relief of jaundice. Without proper management, the outcome is usually poor with developing various complications including negative influences on patients' quality of life [13]. Upon ERCP failed trials, EUS-guided HGS appears to be a good option, and in particular when expertise are present [14].

In our study we tried to compare plastic and metallic stents in EUS-HGS carried out in patients with distal malignant biliary obstruction. Our study showed that both types of stents are valid options with high success and infrequent problems the most serious of them was only single stent migration in the metallic group and it was managed promptly and these complications were infrequent in our study which matches the data reported by previous studies [15,16].

In the past couple of years, a new laser-cut type partially covered SEMS that is self-expandable and has uncovered portion of two centimetres long intrahepatic has been introduced. The stent's shape and design prevent gastric wall from returning back to its original position resulting in less risk of migration [17,18].

The current study highlights the emerging role of EUS-HGS as an effective and safe salvage therapy for patients with malignant biliary obstruction. Our data suggests that this procedure can be carried out using metallic or plastic stents with the same success rate and infrequently reported complications. Finally, larger multicenter, randomized trials are still needed before EUS-HGS stents can be standardized as chosen type in these settings.

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Regarding stent patency, at one month both groups had 100% patent stents with no stent occlusion or displacement.

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