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Outcomes and Safety of EUS-Guided Hepaticogastrostomy in Malignant Biliary Obstruction: A Moroccan Single-Center Experience

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ABSTRACT

Background: Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HG) has emerged as a valuable alternative for biliary drainage in cases of malignant obstruction when endoscopic retrograde cholangiopancreatography (ERCP) fails. Limited data are available from North African and Middle Eastern regions. This study reports outcomes of EUS-HG performed in a Moroccan tertiary referral center.
Methods: Seven consecutive patients undergoing EUS-guided hepaticogastrostomy for malignant biliary obstruction were retrospectively analyzed. Clinical and technical success, stent characteristics, procedural indications, and complications were evaluated and compared with outcomes reported in international literature.
Results: Technical success was achieved in all seven procedures. Clinical success occurred in six patients (85.7%), reflected by resolution of jaundice and improvement in bilirubin levels. All procedures were performed using metal biliary stents, with appropriate dilation and transgastric deployment. No immediate or delayed complications such as bile leak, bleeding, peritonitis, or stent migration were observed. These results align with international data, where technical success ranges from 91% to 100% and complication rates from 10% to 25% [1–4].
Conclusion: EUS-guided hepaticogastrostomy demonstrated excellent technical success and an outstanding safety profile in this Moroccan cohort. These findings support the integration of EUS-HG as a reliable rescue modality for malignant biliary obstruction when ERCP is unsuccessful.

KEYWORDS

Endoscopic ultrasound, EUS-guided tissue acquisition, Solid pancreatic masses, Diagnostic yield.

MAIN ARTICLE

INTRODUCTION

Malignant biliary obstruction is most commonly caused by pancreatic adenocarcinoma, cholangiocarcinoma, or metastatic disease. ERCP has long been considered the gold standard for biliary drainage; however, ERCP may fail in 5% to 10% of cases due to altered anatomy, tumor infiltration, or impassable strictures [1]. In such situations, percutaneous transhepatic drainage has traditionally been used but is associated with significant morbidity, patient discomfort, and the need for repeated interventions [2].

Endoscopic ultrasound-guided biliary drainage (EUS-BD) has gained prominence over the past decade as a minimally invasive alternative with outcomes comparable to ERCP and fewer complications than percutaneous approaches [3]. Among EUS-BD techniques, **hepaticogastrostomy (HG)** involves creating a transgastric access into a dilated left intrahepatic duct, followed by placement of a metal stent to restore biliary flow. It is especially useful for proximal obstructions or when the papilla is inaccessible.

International studies, such as those by Artifon et al. and Paik et al., have shown technical success rates approaching 100% and clinical success between 80% and 90%, although complication rates vary between 10% and 25% [3–5]. Despite these advances, **data from African or Moroccan centers remain extremely limited**.

This study presents the first Moroccan experience focusing exclusively on EUS-guided hepaticogastrostomy in malignant biliary obstruction, evaluating its feasibility, safety, and efficacy, and comparing outcomes to global benchmarks.

METHODS

A retrospective review was conducted of all EUS-guided hepaticogastrostomy procedures performed between 2023 and 2025 in a Moroccan tertiary gastroenterology center. Seven patients with malignant distal or hilar biliary obstruction were included. All EUS-HG procedures were performed after failed ERCP or when ERCP was contraindicated due to duodenal invasion or inaccessible papilla.

Data collected included patient demographics, indication for biliary drainage, type and size of stent, dilation techniques, technical success (defined as successful stent deployment in the

intrahepatic duct), clinical success (defined as ≥50% bilirubin reduction and resolution of cholestatic symptoms), and procedural complications.

Procedures were performed using linear EUS, 19G access needles, guidewire advancement, tract dilation, and deployment of partially covered metal stents. Patients were monitored for immediate and delayed complications.

RESULTS

The analysis included **seven patients** with malignant biliary obstruction, predominantly due to pancreatic adenocarcinoma and hilar cholangiocarcinoma. All individuals were referred after ERCP failure or impossibility, confirming the need for an alternative biliary drainage strategy.

Technical Success

EUS-guided hepaticogastrostomy achieved **100% technical success (7/7)**. In all cases, the left intrahepatic duct was successfully punctured, guidewire access was obtained, the tract was dilated, and a metal stent was deployed without difficulty. This success rate is comparable to the upper range of international reports, where success varies from 91% to 100% [3,4].

Clinical Success

Clinical success was achieved in **six patients (85.7%)**, demonstrated by decreased bilirubin levels and relief of jaundice. This outcome is aligned with international data reporting clinical success between 80% and 90% [3–5].

Safety

No immediate or delayed complications occurred. Notably, there were **no cases of bile leakage, peritonitis, pneumoperitoneum, bleeding, cholangitis, or stent migration**, which are complications described in 10% to 25% of cases internationally [4]. The absence of complications in this cohort reinforces the safety of the technique when performed by experienced endosonographers.

Stent Characteristics

All procedures used metal stents, with lengths and diameters selected according to duct dilation and anatomical characteristics. The use of covered stents matches current recommendations favoring reduced bile leakage and improved stability [1,3].

DISCUSSION

This Moroccan cohort demonstrates that EUS-guided hepaticogastrostomy is a highly effective and exceptionally safe technique for biliary drainage in cases of malignant obstruction where ERCP fails or is contraindicated. The **100% technical success** observed here mirrors the strongest results in the literature. Paik et al. and Artifon et al. have similarly reported technical success exceeding 95% [3–5].

Clinical success in our series (85.7%) is also comparable to international figures, further confirming that EUS-HG is a reliable method for relieving biliary obstruction in advanced malignancy. The absence of complications is particularly noteworthy, as international studies generally report between 10% and 25% adverse events, including bile leakage, abdominal pain, stent occlusion, and infection [4].

Compared to percutaneous drainage, which is associated with significant discomfort, higher rates of infection, and the need for external catheters, EUS-HG offers superior patient comfort and reduced morbidity [2]. The technique is especially useful in situations where duodenal invasion prevents ERCP access.

This study represents the first Moroccan experience focused specifically on hepaticogastrostomy. Previous Moroccan publications have addressed the diagnostic superiority of EUS over CT in pancreatic cancer [6] and its utility in cystic pancreatic lesions [7], but none have detailed therapeutic biliary drainage. This series fills an important gap and illustrates the growing capacity of Moroccan centers to perform advanced interventional EUS procedures.

Although limited by its small sample size, the study is consistent with global trends and demonstrates feasibility, safety, and clinical benefit in a real-world tertiary center setting.

CONCLUSION

EUS-guided hepaticogastrostomy is a highly effective and safe alternative for biliary drainage when ERCP fails. This Moroccan experience demonstrates outcomes comparable to leading international centers and supports broader adoption of EUS-BD techniques in the region. Continued training and increased access to interventional EUS could significantly improve management of malignant biliary obstruction nationwide.

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