

Clinical, Endoscopic, and Outcome Characteristics of Patients with Head of Pancreas Cancer Undergoing ERCP

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Abstract

Original Research Article

Background: Head of pancreas cancer frequently presents with obstructive jaundice secondary to malignant distal common bile duct stricture. Endoscopic retrograde cholangiopancreatography (ERCP) allows both biliary tract evaluation and biliary drainage via stent placement. **Objective:** To describe the clinical, endoscopic, radiological, and outcome characteristics of patients with head of pancreas cancer who underwent ERCP. **Patients and Methods:** A single-center descriptive study including 43 patients between January 2023 and January 2025 at the Mohammed V Military Instruction Hospital in Rabat. Demographic, clinical, biological, radiological, endoscopic data, and early post-procedure complications were analyzed. **Results:** The mean age was 67.2 ± 11.6 years, with a male predominance (79.1%). All patients presented with jaundice, and 41.9% had abdominal pain. Acute cholangitis was present at admission in 41.9% of patients. Mean total bilirubin was 167.4 ± 117.3 $\mu\text{mol/L}$. Main bile duct dilation was observed in 76.7% of patients, and distal common bile duct stricture in 67.4%. Technical success of ERCP was achieved in 30 patients (69.8%). A biliary stent was deployed in 32 patients (74.4%), predominantly plastic. The early complication rate was 11.6%, dominated by post-ERCP acute pancreatitis (7.0%). **Conclusion:** In this series, ERCP achieved biliary drainage in approximately 70% of patients with pancreatic head cancer. Procedural failure was mainly attributable to unsuccessful papillary cannulation. Early complications remained infrequent.

Keywords: Pancreatic cancer; ERCP; obstructive jaundice; biliary drainage; biliary stent.

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INTRODUCTION

Pancreatic cancer is a gastrointestinal malignancy characterized by a dismal prognosis and frequent diagnosis at an advanced stage. Tumors arising in the head of the pancreas manifest early with obstructive jaundice secondary to compression or invasion of the intrapancreatic portion of the common bile duct.

Endoscopic retrograde cholangiopancreatography (ERCP) is an essential endoscopic technique in the management of malignant obstructive jaundice. It enables cholangiographic visualization, stricture characterization, tissue sampling (biopsies or brushings when indicated), and, most importantly, palliative biliary drainage using plastic or self-expandable metallic stents. In pancreatic head cancers, ERCP frequently represents the gold-standard palliative treatment for cholestasis, particularly in unresectable or inoperable patients.

However, ERCP can be technically challenging due to tumor infiltration of the major papilla, duodenal invasion, anatomical distortion, or severe distal malignant strictures. The objective of this study was to describe the clinical, endoscopic, radiological, and outcome characteristics of patients with pancreatic head cancer who underwent ERCP in our institution.

PATIENTS AND METHODS

This was a single-center descriptive observational study involving 43 consecutive patients diagnosed with pancreatic head cancer who underwent ERCP.

Collected parameters included age, sex, cardiovascular and metabolic risk factors, medical and surgical history, clinical signs, total serum bilirubin, findings from abdominal ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and endoscopic ultrasound (EUS), as well as procedural ERCP details. Endoscopic variables analyzed were

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major papilla appearance, performance of endoscopic sphincterotomy, cholangiography findings, main bile duct dilation, presence of distal common bile duct stricture, stent deployment, and early adverse events.

Technical success of ERCP was defined as achieving effective endoscopic biliary drainage, typically via biliary stent placement. Defined early complications included post-ERCP acute pancreatitis, post-procedural hemorrhage, and post-procedural cholangitis.

Qualitative variables were expressed as frequencies and percentages. Quantitative variables were presented as mean $\pm$ standard deviation, median, and range where applicable.

RESULTS

Clinical Characteristics

The study cohort comprised 43 patients, including 34 men (79.1%) and 9 women (20.9%). The mean age was 67.2 ± 11.6 years, with a median of 68 years (range: 40–90 years). Active or former tobacco smoking was noted in 16 patients (37.2%), diabetes mellitus in 12 patients (27.9%), and previous cholecystectomy in 9 patients (20.9%).

All patients presented with obstructive jaundice. Abdominal pain was present in 18 patients (41.9%), and acute cholangitis at admission was diagnosed in 18 patients (41.9%). According to the WHO performance status scale, 16 patients were classified as WHO 1 (37.2%), 17 as WHO 2 (39.5%), 9 as WHO 3 (20.9%), and 1 as WHO 4 (2.3%).

Biological and Radiological Data

Mean total serum bilirubin was 167.4 ± 117.3 $\mu\text{mol/L}$, with a median of 143 $\mu\text{mol/L}$ (range: 32–438 $\mu\text{mol/L}$). Computed tomography was performed in 42 patients (97.7%), abdominal ultrasound in 18 patients (41.9%), magnetic resonance imaging in 8 patients (18.6%), and endoscopic ultrasound in 4 patients (9.3%).

Main bile duct dilation was observed in 33 patients (76.7%), and intrahepatic biliary duct dilation in 19 patients (44.2%). Distal common bile duct stricture was identified in 29 patients (67.4%). Hepatic metastases were identified at baseline imaging in 12 patients (27.9%).

Endoscopic Findings

The major papilla appeared normal in 23 patients (53.5%) and abnormal in 15 patients (34.9%); duodenal tumor invasion was reported in 2 patients (4.7%). Endoscopic sphincterotomy was performed in 31 patients (72.1%). Cholangiography identified a distal bile duct stricture in 29 patients (67.4%). Stricture morphology was categorized as severe/tight in 10 patients, distal in 6, filiform in 4, short in 5, and proximal in 4 patients.

ERCP Outcomes and Biliary Drainage

Technical success of ERCP was achieved in 30 patients (69.8%), while procedural failure occurred in 13 patients (30.2%). Failure was predominantly caused by unsuccessful papillary cannulation (10 patients, 23.3%), followed by failure to pass the guidewire across the stricture (2 patients, 4.7%).

Biliary stent placement was achieved in 32 patients (74.4%), using plastic stents in 24 patients and metallic stents in 9 patients. No nasobiliary drainage was performed.

Table 1. Main clinical, endoscopic, radiological, and procedural characteristics of the study cohort (N = 43)

Parameter	Value / Frequency
Total number of patients	43
Mean age $\pm$ SD, years	67.2 ± 11.6
Male sex, n (%)	34 (79.1)
Obstructive jaundice, n (%)	43 (100.0)
Abdominal pain, n (%)	18 (41.9)
Acute cholangitis at admission, n (%)	18 (41.9)
Mean total serum bilirubin $\pm$ SD, $\mu\text{mol/L}$	167.4 ± 117.3
Main bile duct dilation, n (%)	33 (76.7)
Distal common bile duct stricture, n (%)	29 (67.4)
Hepatic metastases at baseline, n (%)	12 (27.9)
Technical success of ERCP, n (%)	30 (69.8)
Biliary stent placement, n (%)	32 (74.4)
• Plastic stent, n (%)	24 (55.8)
• Metallic stent, n (%)	9 (20.9)
Post-ERCP pancreatitis, n (%)	3 (7.0)
Post-ERCP hemorrhage, n (%)	2 (4.7)

Early Complications

Post-ERCP acute pancreatitis occurred in 3 patients (7.0%). Post-procedure hemorrhage was observed in 2 patients (4.7%). No post-procedural cholangitis was recorded. The overall early complication rate was 11.6% (5/43 patients). No procedure-related mortality occurred.

DISCUSSION

In this series, patients with pancreatic head cancer were predominantly older males, with a mean age of 67.2 years. These demographic findings closely align with global epidemiological patterns of pancreatic adenocarcinoma, which primarily affects individuals over 60 years and exhibits male predominance.

Obstructive jaundice was universal at presentation, as expected in pancreatic head tumors due to their anatomical proximity to the intrapancreatic common bile duct. The marked elevation in mean serum bilirubin ($>160 \mu\text{mol/L}$) reflects substantial cholestasis at presentation. Furthermore, acute cholangitis at admission in nearly 42% of cases emphasizes the critical need for prompt and effective biliary decompression in this vulnerable population.

ERCP achieved successful biliary drainage in 69.8% of patients. This rate is somewhat lower than technical success rates exceeding 90% reported in large multicenter ERCP series for malignant distal biliary obstruction. This discrepancy likely reflects our sample size, single-center real-world setting, advanced local tumor extension, and high rate of papillary cannulation difficulties.

Procedural failure was predominantly driven by unsuccessful papillary cannulation. This finding is consistent with published literature: in distal malignant biliary obstruction secondary to pancreatic cancer, tumor infiltration of the papilla, ampullary distortion, and duodenal invasion significantly impair cannulation. Recent studies confirm that anatomical distortion and altered papillary morphology (such as Type III papilla) independently predict difficult biliary cannulation in pancreatic cancer.

The early complication rate in our series was 11.6%, with post-ERCP acute pancreatitis occurring in 7.0% and post-sphincterotomy/procedural bleeding in 4.7%. These rates remain within accepted benchmark ranges for ERCP adverse events. Difficult cannulation, repeated papillary manipulations, and unintended pancreatic duct cannulation or contrast injection remain well-established risk factors for post-ERCP pancreatitis.

Biliary stents deployed in our cohort were predominantly plastic. The choice between plastic stents

and self-expandable metallic stents (SEMS) depends on tumor resectability, patient life expectancy, cost constraints, and local resource availability. While SEMS are recommended for unresectable disease with extended expected survival due to superior long-term patency, plastic stents remain appropriate for patients with limited survival or those requiring temporary biliary drainage prior to surgical resection.

CONCLUSION

In patients with pancreatic head cancer, ERCP remains a pivotal modality for endoscopic evaluation and palliative biliary drainage of obstructive jaundice. In our institution, ERCP provided effective biliary drainage in approximately 70% of patients. Procedural failure was primarily linked to unsuccessful papillary cannulation, while early adverse events remained uncommon. Long-term prospective studies evaluating stent patency, quality of life, and overall survival will be essential to further clarify the ongoing role of endoscopic biliary drainage in this setting.

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