ERCP–PTBD Rendezvous Method in a Patient with Pancreatic Head Carcinoma and Duodenal Infiltration: A Case Report

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ABSTRACT

Advanced pancreatic head cancer with tumor infiltration into the duodenum is capable of distorting the anatomy and is extremely challenging for selective biliary cannulation during ERCP. In these situations, the ERCP–PTBD rendezvous method served as a valuable alternative. Therefore, this case report aimed to describe the case of a 75-year-old man who presented with obstructive jaundice. On examination, the patient was tachycardic and febrile (38.0°C), with pale conjunctivae and marked scleral icterus. A palpable mass was observed in the epigastric region, and laboratory evaluation showed a total bilirubin level of 18.64 mg/dL. Furthermore, MRCP showed a mass in the pancreatic head infiltrating the duodenum, leading to significant intra- and extrahepatic biliary dilatation. The patient was initially subjected to transhepatic biliary drainage (PTBD), followed by an ERCP using the rendezvous method due to the tumor-related distortion of the papilla. During this procedure, a guidewire was advanced through the PTBD tract and navigated under fluoroscopy into the duodenum, facilitating biliary access and successful placement of a biliary stent. Two days after the intervention, the condition improved, with bilirubin decreasing to 8.91 mg/dL, and the patient was subsequently discharged in stable condition. This case showed the rendezvous method as an effective alternative biliary drainage strategy for patients in whom conventional ERCP was hindered by tumor-related anatomical alterations.

Keywords: *ERCP, PTBD, Rendezvous, Pancreatic Head Cancer, Obstructive Jaundice*

ABSTRAK

Kanker kaput pankreas lanjut, dengan infiltrasi ke duodenum dapat menyebabkan kesulitan kanulasi saat ERCP. Dalam kondisi ini, ERCP rendezvous PTBD dapat menjadi alternatif. Seorang laki-laki berusia 75 tahun datang dengan ikterus obstruktif. Pemeriksaan fisik menunjukkan takikardia, Suhu 38,0°C, konjungtiva pucat, dan sklera ikterik. Teraba massa di daerah epigastrium. Kadar bilirubin total 18,64 mg/dl. Pemeriksaan MRCP menunjukkan massa pada kaput pankreas yang menginfiltrasi duodenum dan menyebabkan pelebaran duktus bilier intra dan ekstrahepatik. Pada pasien dilakukan drainase bilier perkutan (PTBD) Dilanjutkan dengan ERCP dengan teknik rendezvous akibat perubahan anatomi akibat massa tumor. Dua hari pasca-tindakan, kondisi pasien stabil dengan bilirubin total 8,91 mg/dl, dan pasien dipulangkan. Teknik rendezvous mengombinasikan akses PTBD dengan fluoroskopi, di mana kawat pemandu diarahkan melalui saluran PTBD ke dalam duodenum, memudahkan dilakukannya tindakan ERCP dan pemasangan stent bilier. Laporan kasus ini bertujuan memberikan alternatif tatalaksana drainase bilier yang dapat dilakukan pada pasien dengan anatomi papilla yang berubah akibat tumor.

Kata kunci: *ERCP, PTBD, Rendezvous, Kanker Kaput Pancreas, Ikterus Obstruktif*

INTRODUCTION

Pancreatic cancer is a major gastrointestinal malignancy with a rising global incidence. Recent data from the Global Burden of Disease 2021 report showed that there were more than 500,000 new cases in 2021, reflecting a clear upward trend compared with figures from 1990.[1] In the United States, pancreatic cancer accounts for an estimated 67,440 new cases and is associated with approximately 52,000 deaths in 2025. The total 5-year survival rate remains low, at only about 13.3%.[1] In the Asia–Pacific region, pancreatic cancer accounts for approximately half of all new cases worldwide. Elevated incidence rates were observed in countries with a high Human Development Index (HDI).[2]

Endoscopic Retrograde Cholangio-Pancreatography (ERCP) is the gold-standard modality for biliary drainage in obstructive jaundice caused by pancreatic head cancer.[3,4] However, the procedure may fail in cases of complete obstruction or when the tumor has infiltrated the duodenum. In these situations, Percutaneous Transhepatic Biliary Drainage (PTBD) is often used as an alternative, particularly in settings with limited resources. This method carries risks, such as bleeding, catheter dislodgement, and peritonitis.[3]

Over the past decade, endoscopic ultrasound-guided biliary drainage (EUS-BD) served as an alternative for patients in whom ERCP was unsuccessful. The ASGE recommends EUS-BD over PTBD when appropriate expertise and resources are available, as the method offers greater patient comfort. It also avoids the need for an external drainage catheter, which is less physiological.[3] In certain cases, especially in Indonesia, limitations in equipment or available resources may restrict its implementation. A patient with pancreatic head cancer presented with obstructive jaundice that progressed to cholangitis. Initial biliary drainage was carried out through PTBD, considering the clinical condition and the limited availability of EUS-BD. Although conventional ERCP was challenging due to tumor infiltration extending into the duodenum, the existing PTBD access enabled a rendezvous ERCP method, allowing successful internal drainage. This study showed a staged method, which his different from most previously reported cases in which rendezvous procedures were carried out in a single session. In this case, PTBD was first carried out, followed by ERCP using the rendezvous method after clinical stabilization. This strategy was deliberately selected due to the patient's initial unstable condition, making immediate endoscopic intervention less feasible and potentially higher risk, particularly in an elderly patient.

The reported case shows the technical feasibility of the rendezvous method and focuses on the clinical decision-making process behind a stepwise framework. This is particularly relevant in real-world settings with limited resources or in patients with high procedural risk.

CASE ILLUSTRATION

A 75-year-old man presented with obstructive jaundice that had persisted for one month before admission. The symptoms included loss of appetite, nausea, and pale, clay-colored stools. On initial examination, the patient was fully conscious, with stable vital signs. During hospitalization, the patient's mental health became apathetic, developing tachycardia and fever up to 38.0°C. Physical examination showed pale conjunctivae, icteric sclerae, and a palpable mass in the epigastric region. Initial laboratory tests showed a total bilirubin level of 18.64 g/dL, as shown in **Table 1.**

Magnetic Resonance Cholangiopancreatography (MRCP) showed a T1WI–T2WI hypointense lesion with diffusion restriction in the pancreatic head area, measuring approximately 7.3 × 5.8 × 7.4 cm. The mass caused narrowing of the proximal pancreatic duct and distal common bile duct, leading to a dilation of the upstream pancreatic, intrahepatic, and extrahepatic bile ducts, extending to the lumen of the descending duodenum.

Considering the severity of the condition, PTBD was carried out to achieve biliary decompression and control the infection. After PTBD, the patient showed clinical improvement, with total bilirubin decreasing to 11.12 g/dL. ERCP was then attempted, but cannulation was challenging due to tumor-induced duodenal infiltration and compression. This condition distorted the anatomy and made the identification of the papilla of Vater difficult. Biliary stenting was eventually achieved using a rendezvous method, with the guidewire introduced through the PTBD tract and the stent deployed via the ERCP scope. Two days after the procedure, the patient remained clinically stable with a total bilirubin level of 8.91 g/dL and was subsequently discharged.

Table 1. Labs Examination

	Day 1	Day 4	Day 7	Day 10	Day 14
Sign and Symptoms	-	-	Fever, Dyspneu, tachycardia	Fever resolved	-
Treatment	-	-	PTBD	ERCP-Rendezvous	-
Hemoglobin (g/dl)	12.3	12.2	-	9.3	-
Ht (%)	38.9	38.8	-	30.5	-
Leukocyte (/ul)	11.100	10.900	-	10500	-
Thrombocyte (/ul)	347.000	408.000	-	349.000	
PT	-	22.1	27.8	-	-
APTT	-	34.3	34.9	-	-
INR	-	1.66	2.13	-	-
Albumin (g/dl)	2.25	-	2.49	2.58	-
Globulin	-	-	2.69	-	-
AST	160	-	-	-	-
ALT	125	-	-	-	-
Total Bilirubin (mg/dl)	18.64	-	14.37	11.12	8.91

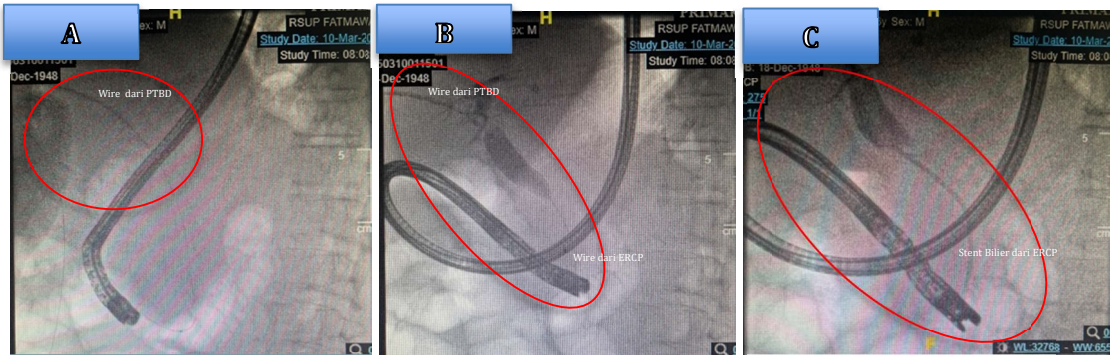

Figure 1. ERCP Procedure. (A). A guidewire was introduced through the PTBD tract and gently advanced across the biliary system until it reached the duodenum, facilitating subsequent endoscopic access. (B). A sphincterotome was then inserted through the endoscope to cannulate the bile duct, followed by cholangiography, which showed proximal dilatation of the common bile duct. (C). A plastic biliary stent was deployed to restore and maintain adequate biliary drainage.

DISCUSSION

Obstructive jaundice is the most common clinical manifestation in patients with advanced pancreatic head cancer. The majority of patients present at a late stage due to the non-specific nature of early symptoms, leaving only a limited opportunity for definitive treatment with surgical resection.[2] This condition leads to jaundice, pruritus, worsens hepatic function, and limits the administration of chemotherapy, as well as significantly reduces the quality of life. The condition may also progress to cholangitis, an infection of the biliary tract that increases both morbidity and mortality.[5,6] Therefore, biliary drainage is an important initial step aimed at improving the patient's quality of life and facilitating the initiation of systemic therapy.[7,8]

Biliary drainage should ideally be carried out before initiating chemotherapy or in the presence of acute complications, such as cholangitis, as severe hyperbilirubinemia increases the risk of chemotherapeutic toxicity.[8] In this case, tumor infiltration led to complete obstruction of the papilla of Vater in the duodenum, making conventional ERCP cannulation extremely difficult. Alternative drainage strategies should be considered as the appropriate management method for this patient since standard ERCP cannulation could not be achieved.

Based on a broader perspective, ASGE guidelines continue to position ERCP as the primary modality for managing malignant biliary obstruction, with EUS-BD recommended as the second-line option when ERCP is unsuccessful. ERCP with stent placement remains the first-line method because of its high technical success rate. [(9)] Valente et al. reported that plastic stents are actually sufficiently cost-effective, but the patency typically lasts only 3-4 months.[7] Self-expandable metal stents (SEMS) have become the preferred choice because the method offers longer patency and reduces the need for reintervention compared with plastic stents.[7,9,10] In a retrospective study by Tavakkoli et al., ERCP was associated with lower mortality and shorter hospitalization duration in patients with advanced pancreatic cancer compared with PTBD or no biliary drainage.[11]

In the study by Ya-Chun Hsu et al., PTBD showed a success rate of 77%, with higher values observed when access was obtained through segments 2/3 (82%) and 5/6 (71.7%). However, access via segments 7/8 produced the lowest success rate at 60.7%.[12] The success of the procedure correlated with the degree of bilirubin reduction, with segments 2/3 and 5/6 showing greater improvement compared with 7/8.[12] In terms of adverse events, 11.8% of patients experienced complications, most of which were mild to moderate. Segment 5/6 had the lowest complication rate (6.4%), followed by 2/3 (9.4%). Meanwhile, segment 7/8 had the highest rate (42.6%), including pleural effusion, hemobilia, infection, and catheter dislodgement.[12] Patient discomfort remains an important concern with PTBD because it requires the use of an external drainage catheter.

EUS-BD using transmural methods, such as choledochoduodenostomy and hepatogastrostomy, may serve as an alternative to ERCP in cases of failed cannulation. Technical success rates of EUS-BD reach approximately 90–95%, with complication rates of 15–24%,[13] consistent with the reports of Itonaga. In patients for whom ERCP is unsuccessful or not feasible, EUS-BD, including EUS-HGS, EUS-CDS, EUS-AGS, and EUS-RV, represents an effective alternative with high technical and clinical success. These outcomes are supported by the development of dedicated EUS-specific stents and improved procedural methods. According to Itonaga, developing evidence suggests that EUS-BD can become a first-line option in selected clinical scenarios. [14]

Recent randomized controlled trial–based meta-analyses show a comparison between EUS-BD and PTBD. EUS-BD is associated with a lower risk of complications, including a significantly reduced incidence of total adverse events compared with PTBD (RR 0.37; 95% CI 0.14–0.97), as well as fewer reinterventions due to stent dysfunction (RR 0.37; 95% CI 0.22–0.61).[15] Moreover, EUS-BD does not require an external drain, thereby reducing patient discomfort, the risk of infection from the percutaneous tract, and mobility limitations frequently encountered with PTBD. These issues can lead to complications in up to 40% of cases, such as catheter malfunction, dislodgement, and cholangitis.[15] EUS-BD also provides a more physiologic internal drainage route, avoids papillary manipulation, and offers a better quality of life due to the absence of a puncture site and the need for external catheter care. The advantages further underscore its superiority over PTBD in the management of malignant biliary obstruction.

Another rational method in settings where EUS is not available is to perform PTBD first to reduce bilirubin levels and control sepsis. After the patient's condition stabilizes, the PTBD access can be used for a rendezvous ERCP procedure, in which a guidewire is advanced toward the duodenum to facilitate internal biliary stent placement. This strategy enables the achievement of more physiological internal drainage compared with relying solely on external drainage.[16,17]

As shown in **Figure 1,** during the advancement of the ERCP scope to the area of the papilla of Vater, a friable, irregular-surfaced duodenal mass was observed, making it difficult to identify the papillary orifice. Therefore, cannulation was carried out using a zebra guidewire introduced through the existing PTBD tract. The wire was advanced from the right intrahepatic bile duct and manually directed into the common bile duct, eventually traversing the papilla of Vater. This was visualized endoscopically from the ERCP scope already positioned in the area. The guidewire was grasped and pulled out through the ERCP scope using a snare.

After externalizing the wire through the ERCP channel, a sphincterotome was advanced, allowing access into the common bile duct. A biliary plastic stent was then inserted stepwise across the stricture, leading to a successful internal drainage, as evidenced by a marked reduction in bilirubin levels by the third day after stent placement. This method is supported by the experiences from various international centers. Liu et al. from Beijing reported a 100% technical success rate (36/36 patients) using the rendezvous method following failed ERCP, accompanied by significant clinical improvement and minimal complications, limited mainly to biliary infections.[17] A retrospective study from Korea by Yang et al. similarly showed a technical and therapeutic success rate of 92.9% and of 88.1% in 42 patients, respectively. These results support the rendezvous method as an effective alternative, particularly in situations where EUS-guided rendezvous is not feasible.[16] An important aspect of this case is the intentional use of a staged strategy rather than a simultaneous method. PTBD was initially carried out to achieve rapid biliary decompression and control infection, as the patient presented with signs of systemic deterioration and was not considered an ideal candidate. ERCP was subsequently performed using the rendezvous method, following clinical improvement, including a reduction in bilirubin levels and stabilization of the system condition. This staged method shows a risk-adapted clinical decision, particularly relevant in elderly

patients, in whom prolonged or complex procedures in a single session may increase procedural risk.

In contrast to the conventional simultaneous rendezvous method, this study shows that delayed, stepwise intervention may offer a safer and more practical alternative, especially in settings where patient stability and resource availability must be carefully balanced. Therefore, the decision to carry out a rendezvous ERCP via PTBD in this patient was rational, accounting for both limitations of available resources and the altered anatomical conditions. This method enabled more physiological internal biliary drainage, reduced the long-term risks associated with external drainage, and is supported by evidence of high success rates from international reports. The case shows that a combined interventional strategy, PTBD followed by ERCP, can serve as an effective solution for patients with advanced pancreatic cancer and obstructive jaundice.

CONCLUSION

In conclusion, this case report shows the challenges in managing obstructive jaundice in advanced pancreatic head cancer with duodenal infiltration and cholangitis. In situations where conventional ERCP is not feasible due to altered anatomy, a rendezvous ERCP method using PTBD access serves as an effective and safe alternative. This method enables more physiological internal biliary drainage, improves the clinical condition, and reduces the long-term risks associated with external drainage. The ERCP–PTBD rendezvous method is feasible in patients with altered anatomy due to advanced pancreatic cancer, showing the importance of a staged, patient-centered method in complex clinical scenarios.

The stepwise strategy of initial PTBD followed by delayed ERCP allowed safer intervention after clinical stabilization and may represent a practical alternative in high-risk or resource-limited settings, especially in patients with cholangitis or biliary sepsis. Furthermore, this case shows a key clinical message that delayed management of malignant biliary obstruction may increase procedural complexity, potentially necessitating advanced methods, such as rendezvous. Despite these limitations, the case reflects a real-world clinical scenario and shows how available resources can be adapted to manage complex biliary obstruction in patients with challenging anatomy. Based on the clinical experience, combined with supporting evidence from the literature, rendezvous ERCP via PTBD may be considered a rational option in centers with limited access to EUS-BD, particularly for critically ill patients requiring urgent biliary decompression.

Limitations

This report shows a single clinical experience and should not be used as a basis for general recommendations or clinical decision-making. The favorable outcome in this patient may have been influenced by several factors, including individual anatomical characteristics, the patency of pre-existing PTBD tract, and the timing of the intervention, which introduces potential bias. In this case report, it was difficult to compare the strategy with other modalities, such as EUS-BD, due to unavailability, which may have influenced the choice of intervention. Finally, the relatively short follow-up limits the ability to comment on long-term outcomes, such as stent patency and the need for reintervention.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this manuscript.

FUNDING

No specific grants.

AUTHOR CONTRIBUTIONS

All authors have contributed to the procedure, literature review, drafting and revising the manuscript. All authors have read and approved the final version.

ACKNOWLEDGMENT

The authors are grateful to the Gastroenterology Department of Fatmawati General Hospital and the ERCP nurses for the assistance in the management.

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