

Case Report

Fatal refractory cholangitis following dual stent placement in an elderly patient with advanced ampullary carcinoma: a case report

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Abstract: An 89-year-old man with advanced ampullary carcinoma developed fatal cholangitis after sequentially placed biliary and duodenal stents. He presented with obstructive jaundice and underwent endoscopic retrograde cholangiopancreatography (ERCP) with plastic biliary stent placement, leading to clinical improvement. He was re-admitted for malignant duodenal obstruction and received a metallic duodenal stent. Post-procedure, he developed severe cholangitis caused by multidrug-resistant (MDR) *Escherichia coli* and *Pseudomonas aeruginosa*. Despite percutaneous transhepatic cholangiographic drainage (PTCD) and broad-spectrum antibiotics, the patient died of septic shock. This case highlights the lethal risk of life-threatening cholangitis in elderly patients with dual stents, emphasizing the need for a proactive prevention strategy, which is proposed in the discussion.

Keywords: Cholangitis, ampullary neoplasms, stents, aged, fatal outcome

Introduction

Ampullary carcinoma, originating from the ampulla of Vater, is a separate clinical entity with-in periampullary carcinoma. This kind of malignancy manifests in the last centimeter of the bile duct where it intersects with the duodenum, and it requires serious treatment that needs to be conducted as soon as possible [1]. A new type of palliative therapy for malignant biliary obstruction which can reduce the risk of patient harm is provided by endoscopic retrograde cholangiopancreatography (ERCP) combined with biliary stenting and it not only provides the relief of symptoms but also increases the quality of life for patients [2, 3]. Disease progression still causes trouble, 15%-20% of patients will acquire duodenal obstruction later on, thus additional endoscopy will be required. The two-stent method provides for new pathways but this may lead to a new pathophysiological problem. This “double stenting” configuration creates a significant safety hazard of cholangitis through multiple mechanisms, mainly by permanently destroying the sphincter

of Oddi barrier function, which facilitates the reflux of bacteria-laden duodenal contents into the biliary system [4].

We present a case of an elderly patient with advanced ampullary carcinoma who developed fatal recurrent cholangitis after dual stenting to highlight the lethal synergy of factors and propose a practical management protocol for this high-risk population.

Case presentation

An 89-year-old male presented on June 24, 2025, with progressive jaundice, pruritus, and 4-kg weight loss. His history included well-controlled hypertension. Initial labs showed malignant biliary obstruction: total bilirubin 123.9 µmol/L, direct bilirubin 71.3 µmol/L, alkaline phosphatase 360 U/L, and γ-glutamyl transferase 387 U/L (**Table 1**). Hypoalbuminemia (28.9 g/L), elevated procalcitonin (12.010 ng/mL), and CA19-9 182.20 U/mL were noted. The Nutritional Risk Screening 2002 (NRS-2002) score was 4, indicating high risk. Baseline lym-

Fatal cholangitis after dual stents

Table 1. Clinical course and key laboratory dynamics

Date/Event	Total Bilirubin (μmol/L)	Direct Bilirubin (μmol/L)	Procalcitonin (ng/mL)	Creatinine (μmol/L)	Clinical Note
Admission 1 (June 24)					
Day 0	123.9	71.3	12.010	82	Obstructive jaundice
Post-biliary stent (Day +5)	45.2	28.1	0.850	79	Clinical improvement
Admission 2 (Aug 9)					
Pre-duodenal stent (Day 0)	17.8	11.2	0.420	88	Stable, planned procedure
Post-duodenal stent (Day +1)	68.5	41.2	2.100	95	Fever, rigors
Day +2 (ICU admission)	110.7	69.6	4.570	152	Septic shock, anuria
Day +3 (Post-PTCD)	98.3	58.4	3.110	189	On CRRT
Day +4 (Expired)	-	-	-	-	Multi-organ failure

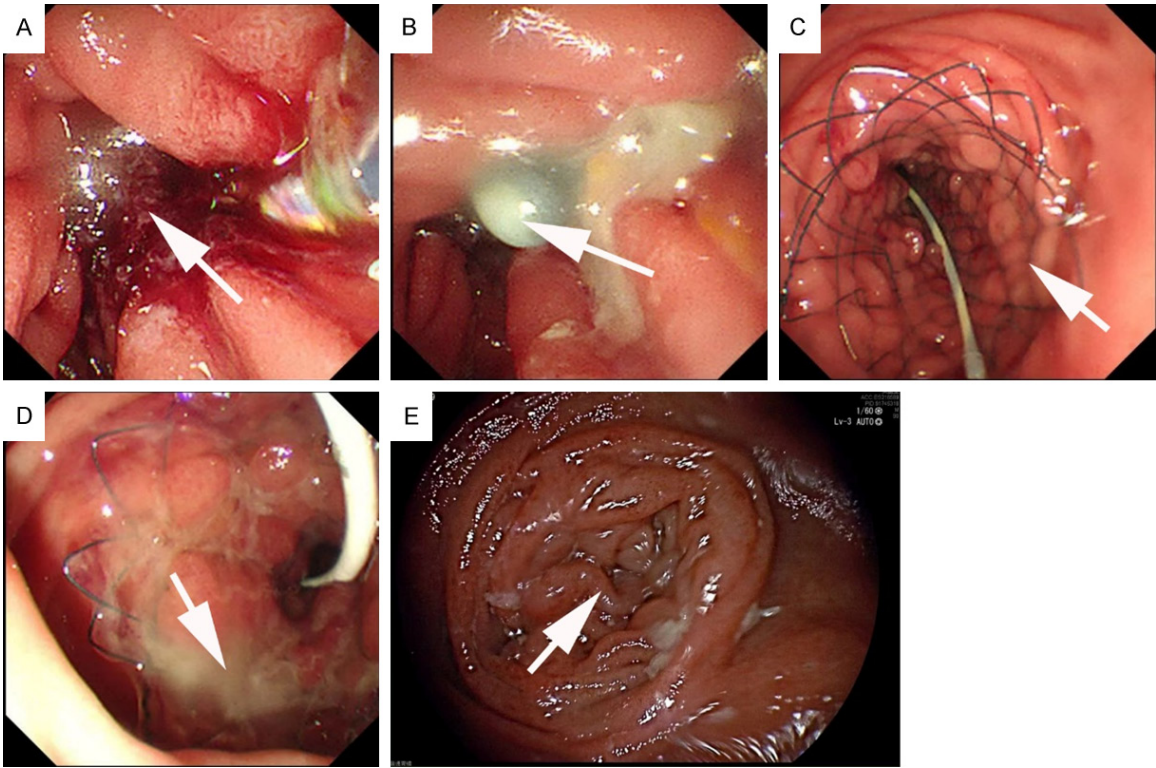


Figure 1. Endoscopic sequence of the diagnostic and therapeutic procedures. A. Initial endoscopic view showing a tumor mass (arrow) at the major duodenal papilla. B. Drainage of purulent bile (arrow) following initial endoscopic biliary stenting, indicating established infection. C. Deployed metallic duodenal stent (arrows) bridging the malignant obstruction in the descending duodenum, showing adequate expansion. D. Endoscopic view demonstrating failed biliary cannulation; the duodenal stent mesh obstructs the papillary orifice, preventing access (arrow indicates the blocked cannulation site). E. Endoscopic image revealing significant luminal narrowing (arrow) in the descending duodenum prior to stent placement.

phocyte subset analysis showed a decreased CD4+ T-cell count (280 cells/μL) and a CD4/CD8 ratio of 0.9, suggesting impaired cellular immunity.

ERCP revealed a stenotic ampulla with proximal dilatation (**Figure 1A**). A 10Fr plastic biliary stent was placed (**Figure 1B**), and biopsies

confirmed moderately differentiated adenocarcinoma. Bilirubin normalized to 45.2 μmol/L within a week, and he was discharged on July 1, 2025.

He was readmitted on August 9, 2025, with epigastric pain, postprandial vomiting, and early satiety. Computed tomography (CT) showed a

4.5-cm duodenal mass causing narrowing and right hydronephrosis. Endoscopy revealed significant luminal narrowing in the descending duodenum (**Figure 1E**). After nutritional optimization, an uncovered metal duodenal stent (22*60 mm) was placed on September 1, 2025, with symptom relief (**Figure 1C**).

Within 24 hours, the patient spiked a fever to 39.2°C, with worsening jaundice and altered mental status. Labs showed a persistent procalcitonin of 4.570 ng/mL and increased bilirubin (total: 110.7 µmol/L). Blood cultures grew MDR *Escherichia coli* and *Pseudomonas aeruginosa* (both ESBL-producing). Empirical cefoperazone-sulbactam was started.

A repeat ERCP on September 3 showed a properly positioned duodenal stent, but biliary cannulation was impossible due to the papillary orifice being blocked by the stent mesh (**Figure 1D**). The patient developed septic shock (lactate 12.10 mmol/L), requiring vasopressors and ICU transfer. His estimated glomerular filtration rate (eGFR) was 45 mL/min; therefore, meropenem was adjusted to 1 g q8h and linezolid to 600 mg q12h following our institutional geriatric protocol. Emergency PTCd successfully decompressed the biliary system, and bile cultures yielded the same MDR organisms. Despite maximal organ support, the patient died on September 4, 2025.

Discussion

This case demonstrates the potentially fatal outcome of infectious complications after the combined stent of biliary and duodenal ducts in elderly patients with advanced malignancy. The unique lethality of this scenario arises from a 'perfect storm' of three factors: (1) permanent loss of the sphincter of Oddi barrier function, creating a direct channel for bacteria from the duodenum into the biliary system [5]; (2) stent-induced mucosal erosion and microscopical spaces that facilitate bacterial colonization and biofilm formation [6]; and the critical technical failure of biliary access due to the duodenal stent mesh blocking the papilla, making emergency decompression challenging. This was compounded by infection with multidrug-resistant (MDR) organisms [7].

To enhance the clinical utility of this report, we propose a simple prevention protocol for high-

risk elderly patients requiring dual stents: (1) Pre-duodenal-stent checklist: optimize nutrition (NRS-2002 <3 if possible), obtain bile culture if feasible, and assess baseline renal/hepatic function; (2) Stent sequence: place biliary stent first, reassess biliary drainage stability after 2 weeks, then consider duodenal stent only if drainage is adequate; (3) Prophylactic antibiotics: administer a single dose of an anti-MDR agent (e.g., piperacillin-tazobactam) 30-60 minutes before duodenal stenting. This protocol addresses the modifiable risk factors identified in this case.

Critically, our failure to achieve biliary cannulation after duodenal stenting represents a known technical challenge, as the metal mesh can directly obstruct the papilla. This drawback becomes particularly dangerous when emergency biliary decompression is essential for sepsis control. While recent advancements, such as forward-viewing endoscopes and dedicated accessories for through-stent cannulation [8-10], offer potential solutions, their efficacy in acute emergency settings remains unproven.

The microbiological profile isolated in this case is also demonstrated changes in the antimicrobial resistance of healthcare-associated biliary infection. The presence of ESBL-producing Enterobacteriaceae and multidrug-resistant *Pseudomonas aeruginosa* highlights the selective pressure of hospital antibiotic use and the urgent need for early culture-directed therapy [11]. The choice of cefoperazone-sulbactam at the beginning of this case, while it can cover common biliary tract pathogens, failed in the treatment of these resistant bacteria, indicating that carbapenem-based regimens might be more suitable as the first choice of empirical therapy for patients with a history of recent healthcare exposure or prior antibiotic use [12].

The patient's high NRS-2002 score and low CD4 count quantitatively demonstrated his physiological vulnerability, explaining his rapid deterioration. The diminished physiological reserve in elderly, malnourished patients limits their capacity to mount effective immune responses and tolerate the metabolic demands of sepsis. This case underscores the critical importance of a multidisciplinary geriatric assessment before performing invasive palliative

procedures in older individuals, carefully balancing anticipated improvements in quality of life against procedure-related risks.

The limitations of this report include its single-case nature, precluding causal inferences or generalizable prevalence rates. Management decisions were influenced by the patient's particular clinical situation and the institutional capability, limiting direct applicability to other settings. Furthermore, the absence of an autopsy prevents definitive assessment of the exact anatomical relationship between the stent and the surrounding structures at the time of death.

Conclusion

This case illustrates the potentially fatal outcome of refractory cholangitis after dual stent placement in an elderly patient with advanced cancer. Anatomical barrier disruption, failed biliary access, and MDR organisms all contributed. We provide a practical prevention protocol to enhance vigilance and guide management in this high-risk population.

Disclosure of conflict of interest

None.

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