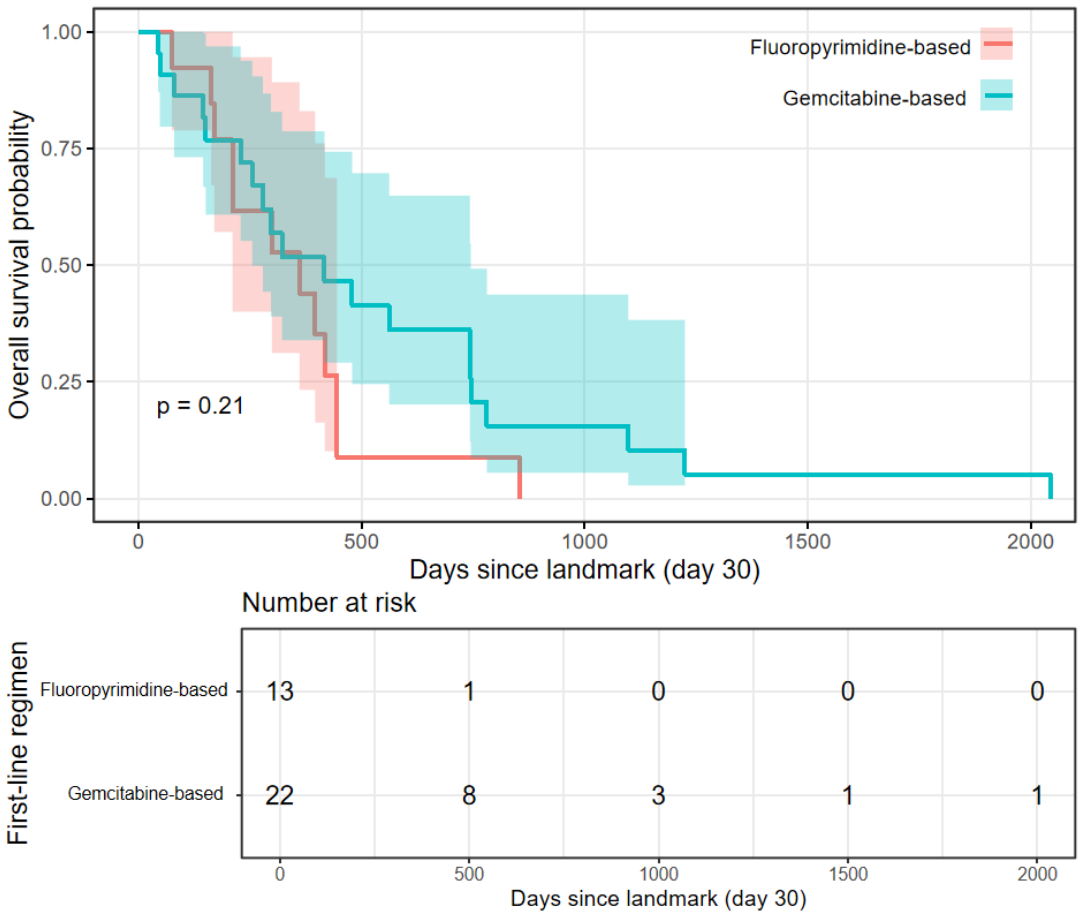


Supplementary Figure 1 Survival according to first-line regimen. Landmark overall survival according to first-line chemotherapy regimen among patients initiating chemotherapy within thirty days after endoscopic retrograde cholangiopancreatography. Kaplan-Meier curves compare patients receiving fluoropyrimidine-based regimens with those receiving gemcitabine-based regimens. Fluoropyrimidine-based regimens included FOLFIRINOX, SOXIRI, and FOLFOX. Gemcitabine-based regimens included nab-paclitaxel plus gemcitabine, gemcitabine monotherapy, and gemcitabine plus S-1. One patient receiving oral S-1 monotherapy was reported descriptively but was not included in this two-category survival comparison. Survival time was calculated from the thirty-day landmark. The log-rank comparison did not reach statistical significance, and the analysis was exploratory because of the small number of patients in each subgroup.

Supplementary Table 1 Stent type distribution in the 30-day landmark endoscopic retrograde cholangiopancreatography cohort, *n* (%)

Stent type	Overall landmark cohort (*n* = 61)	No chemotherapy within 30 days (*n* = 25)	Chemotherapy within 30 days (*n* = 36)	*P* value
Metal stent	30 (49.2)	11 (44.0)	19 (52.8)	0.435
Plastic stent	29 (47.5)	14 (56.0)	15 (41.7)	
Uncertain/other	1 (1.6)	0	1 (2.8)	
ERCP failure/no stent	1 (1.6)	0	1 (2.8)	

ERCP: Endoscopic retrograde cholangiopancreatography. The *P* value compares metal versus plastic stents only, excluding patients with uncertain/other stent information and endoscopic retrograde cholangiopancreatography failure/no stent. Stent type was summarized descriptively as an intra-procedural variable and was not included in the primary propensity score model, which was restricted to baseline covariates measured at or before the index endoscopic retrograde cholangiopancreatography.

Supplementary Table 2 Weight diagnostics for the primary inverse probability of treatment weighting analysis

Diagnostic item	Value
Analytic sample	61
No chemotherapy within 30 days	25
Chemotherapy within 30 days	36
Propensity score model	Firth logistic regression
Weight type	Stabilized ATE IPTW
Truncation rule	Winsorization at the 1% and 99%
Propensity score range, no chemotherapy within 30 days	0.152-0.815

Propensity score range, chemotherapy within 30 days	0.223-0.895
Common-support range	0.223-0.815
Raw stabilized weight, minimum	0.483
Raw stabilized weight, 1%	0.502
Raw stabilized weight, median	0.885
Raw stabilized weight, 99%	2.493
Raw stabilized weight, maximum	2.643
Trimmed stabilized weight, minimum	0.502
Trimmed stabilized weight, 1%	0.509
Trimmed stabilized weight, median	0.885
Trimmed stabilized weight, 99%	2.433
Trimmed stabilized weight, maximum	2.493
Effective sample size, overall	51.99
Effective sample size, no chemotherapy within 30 days	21.19
Effective sample size, chemotherapy within 30 days	30.91
Maximum post-weighting absolute SMD	0.208
Covariate with maximum post-weighting absolute SMD	Baseline total bilirubin

ATE: Average treatment effect; IPTW: Inverse probability of treatment weighting; SMD: Standardized mean difference. Propensity scores were estimated using Firth logistic regression. Stabilized average treatment effect weights were truncated by winsorization at the 1% and 99%. The common-support range was defined by the overlapping propensity-score range between the two treatment groups. Effective sample size was calculated as $(\text{sum } w)^2/\text{sum } w^2$. The maximum post-weighting absolute standardized mean difference was observed for baseline total bilirubin.

Supplementary Table 3 First-line chemotherapy regimens among patients initiating chemotherapy within thirty days after endoscopic retrograde cholangiopancreatography

First-line chemotherapy regimen		*n*
Fluoropyrimidine-based	FOLFIRINOX	10
	SOXIRI	1
	FOLFOX	2
Subtotal		13
Gemcitabine-based	Gemcitabine	2
	AG	19
	Gemcitabine + S-1	1
Subtotal		22
Oral S-1 monotherapy		1
Total		36

S-1: Tegafur/gimeracil/oteracil; SOXIRI: Tegafur/gimeracil/oteracil, oxaliplatin, and irinotecan. Fluoropyrimidine-based regimens included FOLFIRINOX, tegafur/gimeracil/oteracil, oxaliplatin, and irinotecan, and FOLFOX. Gemcitabine-based regimens included gemcitabine monotherapy, nab-paclitaxel plus gemcitabine, and gemcitabine plus tegafur/gimeracil/oteracil. Oral tegafur/gimeracil/oteracil monotherapy was reported descriptively but was not included in the two-category survival comparison between fluoropyrimidine-based and gemcitabine-based regimens.

Supplementary Table 4 Documented barriers to chemotherapy initiation within 30 days among patients without early chemotherapy, *n* (%)

Category	Documented barrier	No chemotherapy within 30 days (*n* = 25)

Biochemical/hepatic recovery	Delayed bilirubin decline or inadequate hepatic recovery	6 (24.0)
Infectious barrier	Biliary infection or severe biliary infection	4 (16.0)
Stent-related barrier	Stent re-obstruction or dislodgement	6 (24.0)
Clinical condition	Poor performance status, recovery phase, or treatment intolerance	7 (28.0)
Disease course	Rapid disease progression	0
Treatment decision	Patient preference or refusal of chemotherapy	7 (28.0)
Documentation	Insufficient documentation/unclear barrier	0

Categories were not mutually exclusive because several patients had overlapping documented barriers to chemotherapy initiation. Reasons were abstracted retrospectively from available medical records and are presented descriptively rather than as formal causal attribution. “Biochemical/hepatic recovery” included delayed bilirubin decline and inadequate hepatic recovery. “Stent-related barrier” included stent re-obstruction and stent/biliary drainage dislodgement.