

Supporting information

The Supplementary Materials include

Supplementary Methods

Supplementary Figures: S1 Subgroup analysis of technical success rate. **S2** Subgroup analysis of clinical success rate. **S3** Subgroup analysis of rate of overall adverse events. **S4** Subgroup analysis of reintervention rate.

Supplementary Tables: S1 The definitions of outcomes across the included studies (retrieved from the original studies). **S2** Quality of the included studies using the Methodological Index for Non-randomized Studies.

Supplementary Methods

Details of the search strategy.

PubMed

1. EUS [Title/ Abstract]
2. Endoscopic ultrasound [Title/ Abstract]
- 3.1 OR 2 (n = 10051)
4. Lumen-apposing fully covered metal stent* [Title/ Abstract]
5. Lumen-apposing metal stent* [Title/ Abstract]
6. Lumen apposing metal stent* [Title/ Abstract]
7. Lumen-apposing stent* [Title/ Abstract]
8. Electrocautery-enhanced [Title/ Abstract]
9. Electrocautery-enabled [Title/ Abstract]
10. Electrocautery-tip [Title/ Abstract]
11. Cautery-enabled [Title/ Abstract]
12. LAMS [Title/ Abstract]
13. ECE-LAMS [Title/ Abstract]
14. EC-LAMS [Title/ Abstract]
15. 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 (n = 910)
16. Biliary drainage [Title/ Abstract]
17. Biliary tree drainage [Title/ Abstract]
18. Transmural drainage [Title/ Abstract]
19. Biliary obstruction [Title/ Abstract]
20. Bile duct obstruction [Title/ Abstract]
21. Obstructive jaundice [Title/ Abstract]
22. Choledochoduodenostomy [Title/ Abstract]
23. 16 OR 17 OR 18 OR 19 OR 20 OR 21 OR 22 (n = 5746)
24. 3 AND 15 AND 23 (n = 130)

Embase

#1 'eus':ti,ab AND [2012-2022]/py AND [english]/lim (n = 16842)

#1 'endoscopic ultrasound':ti,ab AND [2012-2022]/py AND [english]/lim (n = 12295)

#3 #1 OR #2 (n = 21132)

#4 'lumen-apposing fully covered metal stent*':ti,ab AND [2012-2022]/py AND [english]/lim (n = 13)

#5 'lumen-apposing metal stent*':ti,ab AND [2012-2022]/py AND [english]/lim (n = 1199)

#6 'lumen apposing metal stent*':ti,ab AND [2012-2022]/py AND [english]/lim (n = 1199)

#7 'lumen-apposing stent*':ti,ab AND [2012-2022]/py AND [english]/lim (n = 137)

#8 'electrocautery-enhanced':ti,ab AND [2012-2022]/py AND [english]/lim (n = 154)

#9 'electrocautery-enabled ':ti,ab AND [2012-2022]/py AND [english]/lim (n = 3)

#10 'electrocautery-tip':ti,ab AND [2012-2022]/py AND [english]/lim (n = 14)

#11 'cautery-enabled':ti,ab AND [2012-2022]/py AND [english]/lim (n = 9)

#12 'lams':ti,ab AND [2012-2022]/py AND [english]/lim (n = 1127)

#13 'ece-lams':ti,ab AND [2012-2022]/py AND [english]/lim (n = 17)

#14 'ec-lams':ti,ab AND [2012-2022]/py AND [english]/lim (n = 25)

#15 #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 (n=1707)

#16 'biliary drainage':ti,ab AND [2012-2022]/py AND [english]/lim (n = 4040)

#17 'biliary tree drainage':ti,ab AND [2012-2022]/py AND [english]/lim (n = 3)

#18 'transmural drainage':ti,ab AND [2012-2022]/py AND [english]/lim (n = 418)

#19 'biliary obstruction':ti,ab AND [2012-2022]/py AND [english]/lim (n = 3974)

#20 'bile duct obstruction':ti,ab AND [2012-2022]/py AND [english]/lim (n = 600)

#21 'bile duct obstruction':ti,ab AND [2012-2022]/py AND [english]/lim (n = 3190)

#22 'choledochoduodenostomy':ti,ab AND [2012-2022]/py AND [english]/lim (n = 548)

#23 #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 (n = 10181)

#24 #3 AND #15 AND #23 (n = 307)

Scopus

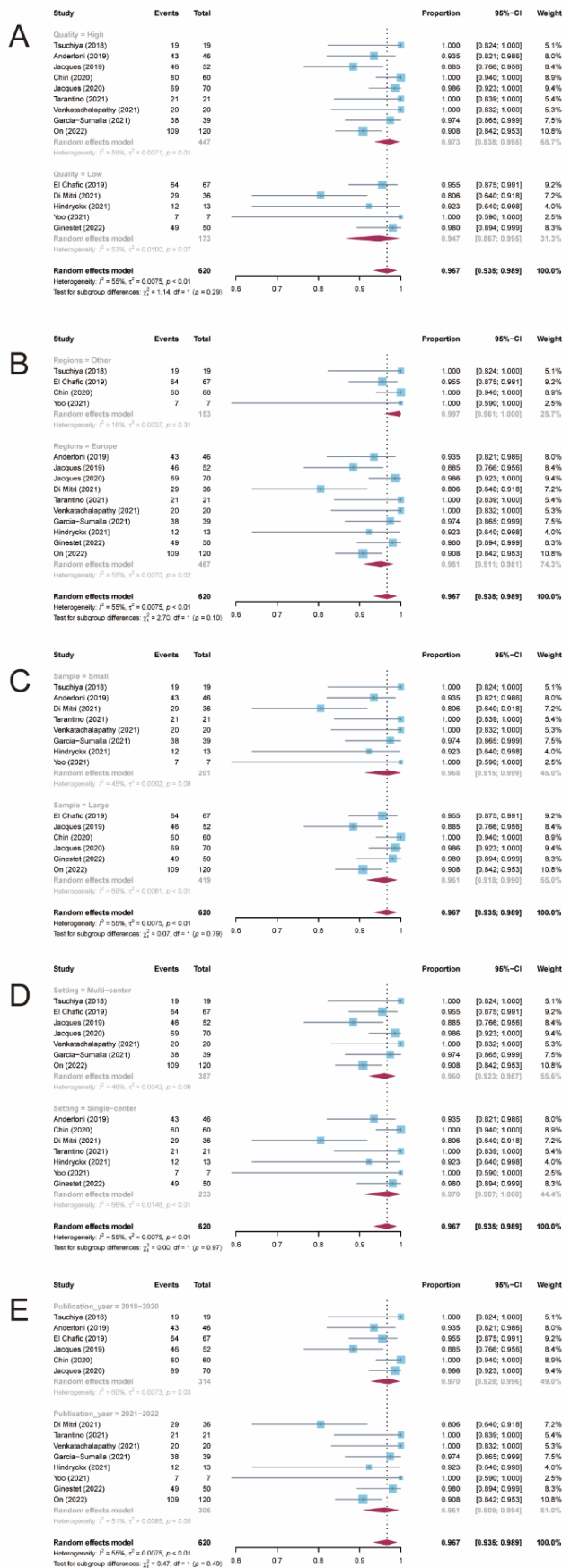
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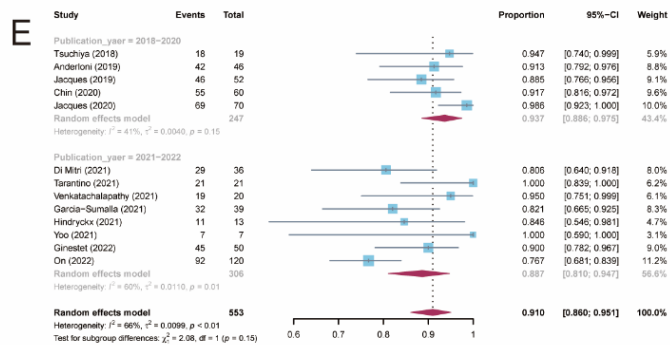
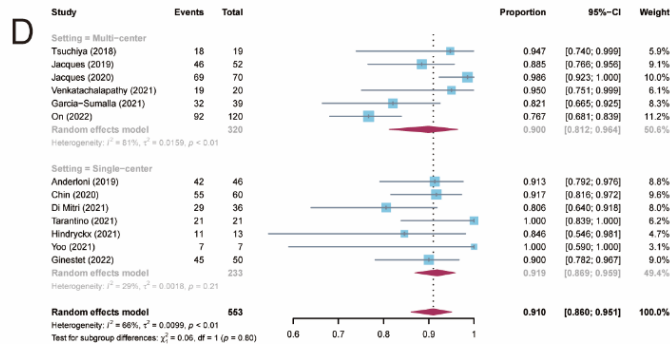
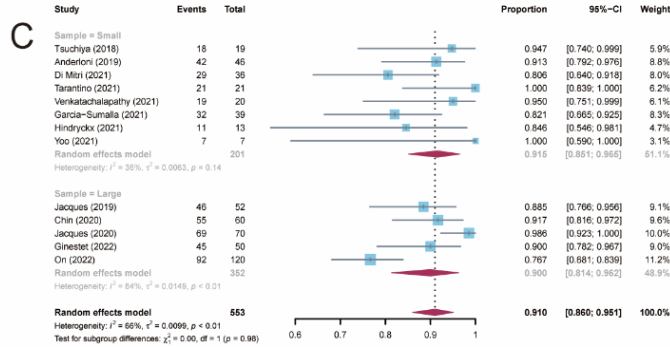
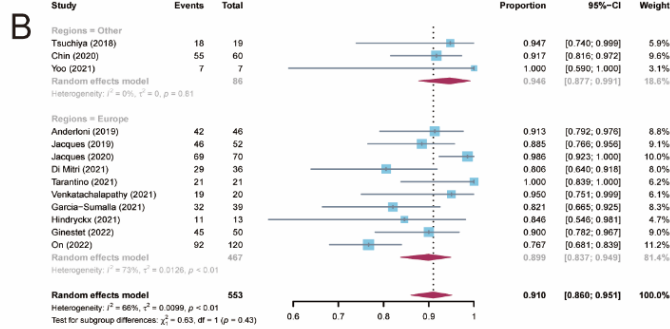
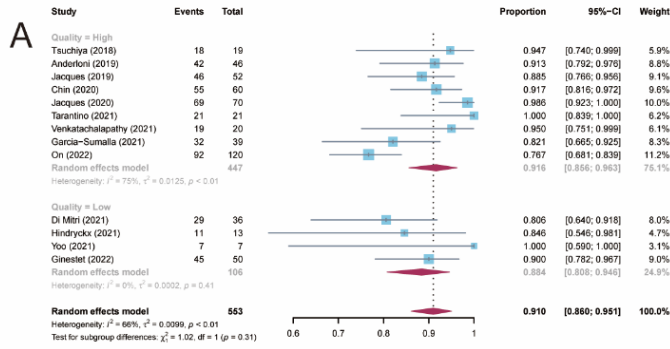
#3 (TITLE-ABS-KEY ("Biliary drainage") OR TITLE-ABS-KEY ("Biliary tree drainage") OR TITLE-ABS-KEY ("Transmural drainage ") OR TITLE-ABS-KEY ("Biliary obstruction") OR TITLE-ABS-KEY ("Bile duct obstruction") OR TITLE-ABS-KEY ("Obstructive jaundice") OR TITLE-ABS-KEY ("Choledochoduodenostomy")) AND PUBYEAR > 2011 AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (LANGUAGE, "English")) (n = 7486)

#4 #1 AND #2 AND #3 (n = 125)

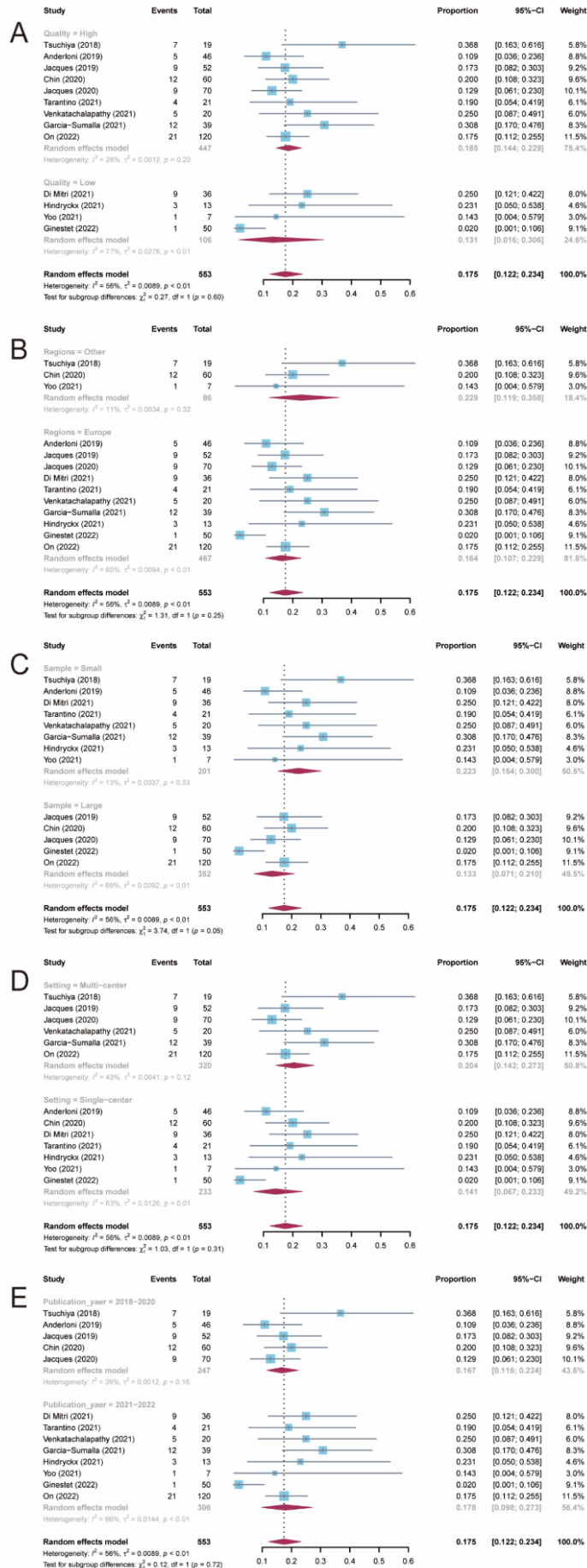
Supplementary Figures



Supplementary Figure 1 Subgroup analysis of technical success rate. A: Forest plot for quality of studies; B: Forest plot for location of studies; C: Forest plot for cohort size; D: Forest plot for number of study participants; E: Forest plot for year of publication.

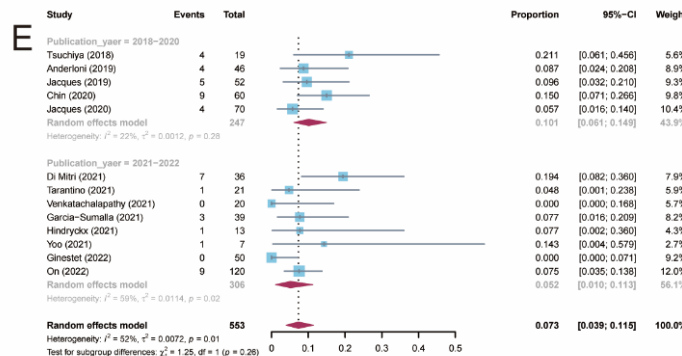
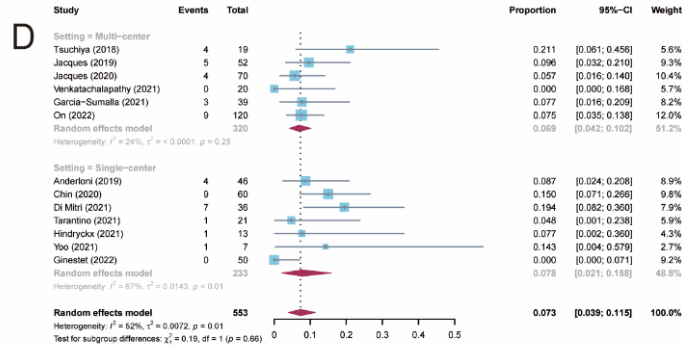
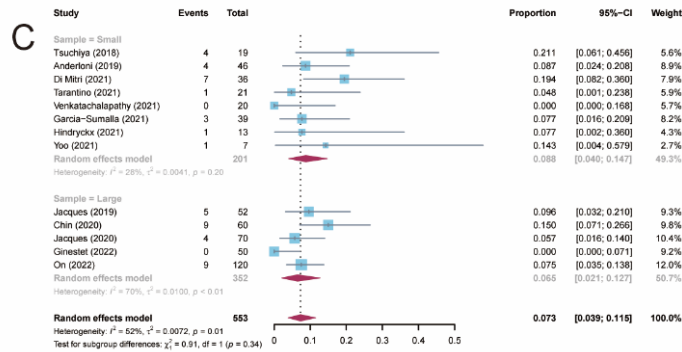
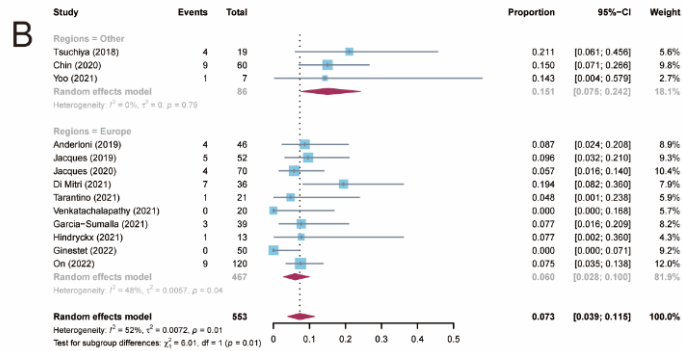
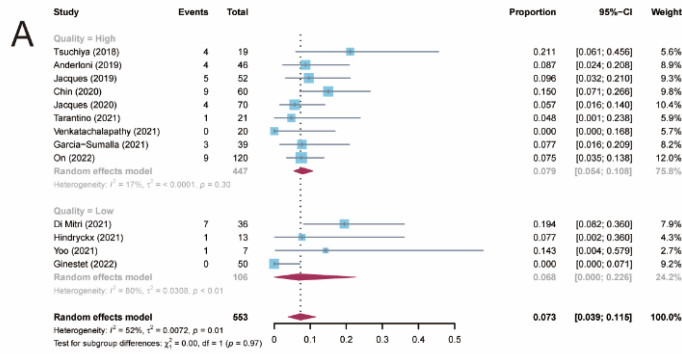


Supplementary Figure 2 Subgroup analysis of clinical success rate. A: Forest plot for quality of studies; B: Forest plot for location of studies; C: Forest plot for cohort size; D: Forest plot for number of study participants; E: Forest plot for year of publication.



Supplementary Figure 3 Subgroup analysis of rate of overall adverse events.

A: Forest plot for quality of studies; B: Forest plot for location of studies; C: Forest plot for cohort size; D: Forest plot for number of study participants; E: Forest plot for year of publication.



Supplementary Figure 4 Subgroup analysis of reintervention rate. A: Forest plot for quality of studies; B: Forest plot for location of studies; C: Forest plot for cohort size; D: Forest plot for number of study participants; E: Forest plot for year of publication.

Supplementary Table 1 The definitions of outcomes across the included studies (retrieved from the original studies)

Author (year)	Technical success	Clinical success	Adverse events (AE): Short-term or long-term
Tsuchiya (2018)	Accurate positioning of the stent across the duodenal wall to the bile duct, along with the flow of the radiocontrast medium and bile through the stent.	Total bilirubin level to <3.0 mg/dL or 50% reduction.	Not available.
Anderloni (2019)	Placement of an ECE-LAMS in the extrahepatic bile duct.	Serum bilirubin level decrease of 50% or more within 2 weeks after the procedure.	Intraprocedural and either immediate or late when they occurred within and after 1 week after stent placement.
El Chafic (2019)	Accurate positioning of the stent across the duodenal wall to the bile duct.	Resolution of jaundice or drop in total bilirubin level by > 50% within 4 weeks after the EUS-CD.	AE occurring during the procedure were defined as immediate AE. AEs occurring after the procedure were defined as either early if within 24 h from the procedure or late thereafter.

Jacques (2019)	The ability to correctly deploy the Hot Axios stent between the CBD and the duodenal bulb with visualization of bile flow.	Decrease in bilirubin of at least 50% at day 7.	Short-term complications: all complications occurring in the period between the procedure and discharge from hospital. Long-term complications: all complications occurring after discharge from hospital.
Chin (2020)	Successful transluminal placement of bilioenteric fully-covered stents.	Reduction in absolute bilirubin > 50% at any time point.	Early or late when they occurred within and after 30 days after stent placement.
Jacques (2020)	Correctly deploy the ECE-LAMS between the common bile duct and the duodenal bulb with visualization of bile flow.	Decrease in the bilirubin of at least 50% at day 7, or normalization at day 28.	Short-term complications: all complications occurring in the period between the procedure and discharge from hospital. Long-term complications: all complications occurring after discharge from hospital.
Di Mitri (2021)	Correct ECE-LAMS deployment with distal flange into the CBD or gallbladder.	Resolution of jaundice with drop/normalization or minimum 50% reduction of initial bilirubin levels after 14 days.	Classified either as intraprocedural, or as immediate or late, according to whether adverse events occurred less or more than 24 h after stent placement, respectively.

Tarantino (2021)	Correct deployment of the stent with the distal flange into the CBD and the proximal flange into the lumen of the stomach or the duodenal bulb.	Normalization or minimum 50% reduction of initial bilirubin levels.	Not available.
Venkatachalapathy (2021)	Correct LAMS placement.	Decrease in bilirubin of at least 50% at day 7.	Not available.
Garcia-Sumalla (2021)	Successful stent placement between the extrahepatic bile duct and duodenal lumen and determined by endoscopy and fluoroscopy.	A reduction in bilirubin by 30% at 4 weeks after stent placement.	AEs were classified as immediate (< 24 h), short-term (up to 12 days), or late (any time after 12 days).
Hindryckx (2021)	Correct LAMS placement.	> 50% drop in baseline serum bilirubin within 2 weeks.	Classified either as intraprocedural, or as immediate or late, according to whether adverse events occurred less or more than 24 h after stent placement, respectively.

Yoo (2021)	Correct LAMS placement.	At least 50% in serum levels of bilirubin from baseline within 1 week after the procedure.	Classified either as intraprocedural, or as immediate or late, according to whether adverse events occurred less or more than 24 h after stent placement, respectively.
Ginestet (2022)	Correct stent positioning in the main bile duct and the presence of bile flow at the end of EUS-BD.	A fall in bilirubin at 1 month to the point where chemotherapy can be performed.	Not available.
On (2022)	Successful creation of a choledochoduodenostomy with the ECE-LAMS without requiring a further stent to bridge the ECE-LAMS.	A reduction in serum bilirubin to at least 50% of its preprocedural level within 14 days of ECE-LAMS placement.	AEs were classified as peri-procedural, post-procedural (up to 14 days), or late (any time after 14 days).

EUS-BD: Endoscopic Ultrasound-biliary drainage; ECE-LAMS: Electrocautery-enhanced lumen-apposing metal stent; CBD: Common bile duct.

Supplementary Table 2 Quality of the included studies using the Methodological Index for Non-randomized Studies

Study	A clearly stated aim	Inclusion of consecutive patients	Prospective collection of data	Endpoints appropriate to the aims of the study	Unbiased assessment of the study endpoint	Follow-up period appropriate to the aim of the study	Loss to follow up less than 5%	Prospective calculation of the study size	Total
Tsuchiya (2018)	2	2	2	2	1	2	2	0	13
Anderloni (2019)	2	2	2	2	1	2	2	0	13
El Chafic (2019)	2	0	0	2	1	2	2	0	9
Jacquesc (2019)	2	2	0	2	1	2	2	0	11
Chin (2020)	2	0	2	2	1	2	2	0	11
Jacques (2020)	2	2	2	2	1	2	2	0	13
Di Mitri (2021)	2	0	0	2	1	2	2	0	9
Tarantino (2021)	2	2	2	2	1	2	2	0	13
Venkatachalapathy (2021)	2	2	2	2	1	1	2	0	12

Garcia-Sumalla

(2021)	2	2	0	2	1	2	2	0	11
Hindryckx (2021)	2	2	0	2	0	0	0	0	6
Yoo (2021)	2	0	2	2	1	0	0	0	7
Ginestet (2022)	2	0	2	2	1	0	0	0	7
On (2022)	2	2	2	2	1	2	2	0	13
