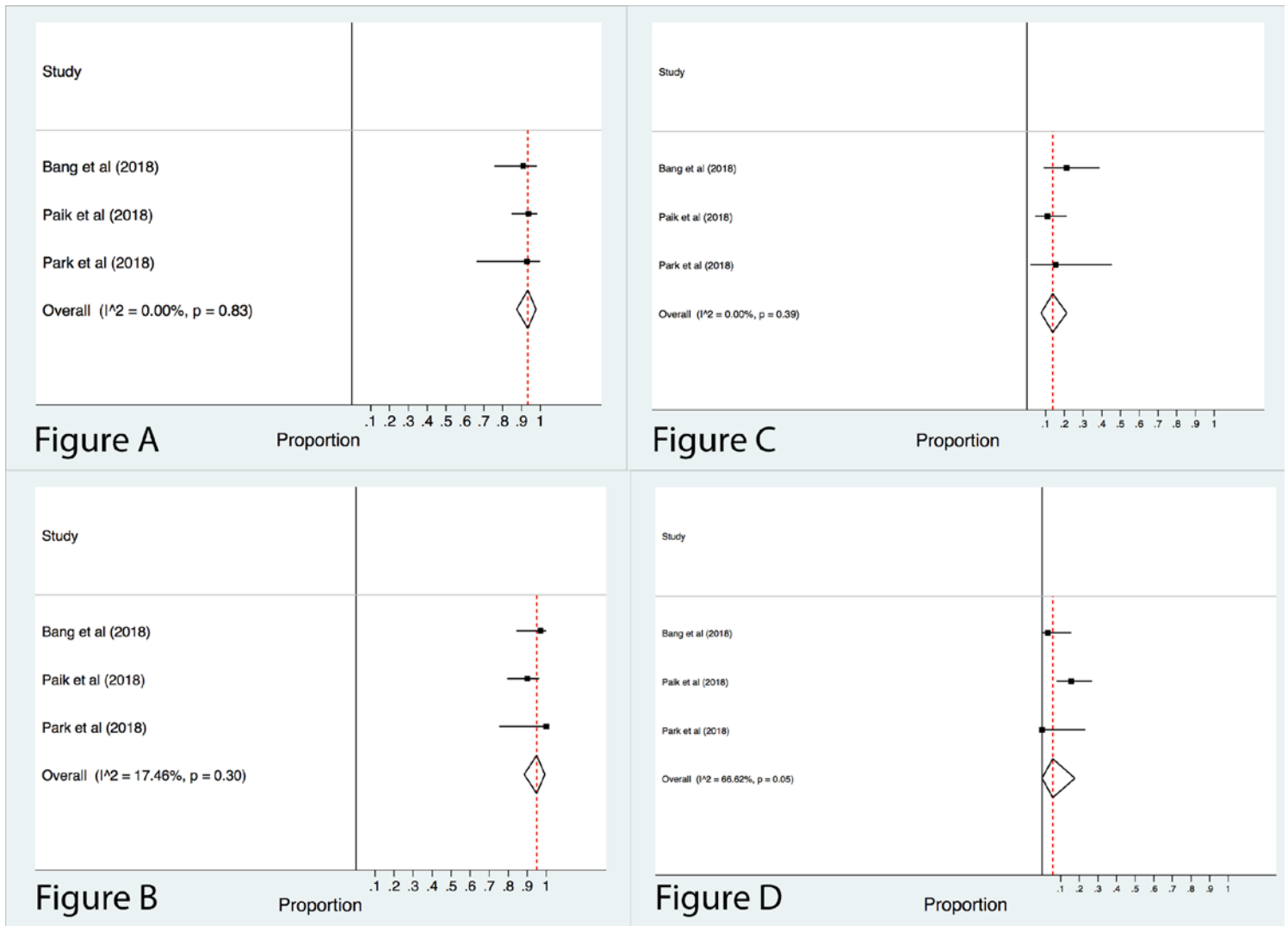


Supplementary Material

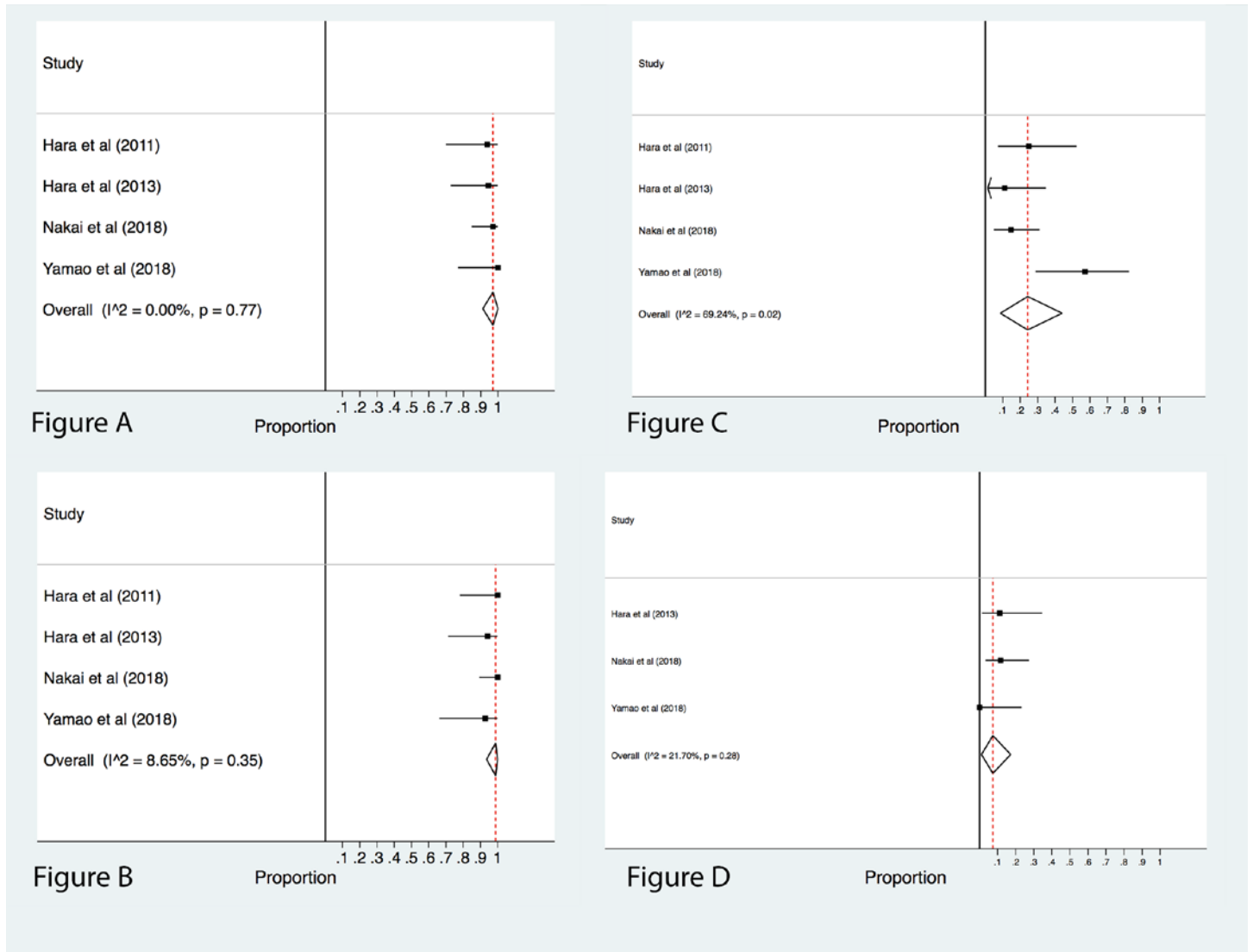
Supplemental table Profile of clinical success, technical success, and adverse events of EUS-BD versus ERCP.

| Author and Year | Technical Success Rate (%) | Clinical Success Rate (%) | Adverse Event Rate (%) | Description of Adverse Events |
|-------------------|----------------------------|---------------------------|------------------------|---|
| Paik et al, 2018 | EUS-BD: 60/64 (93.75) | EUS-BD: 54/60 (90.00) | EUS-BD: 7/64 (10.94) | EUS-BD: Early: Self-limited pneumoperitoneum (2), Bile peritonitis (1), Cholangitis (1); Late: Cholangitis (3) |
| | ERCP: 55/61 (90.16) | ERCP: 52/55 (94.55) | ERCP: 24/61 (39.34) | ERCP: Early: Pancreatitis (9), Acute cholecystitis (2), Stent migration (1); Late: Acute cholangitis (6), Acute Cholecystitis (3) Stent occlusion (3) |
| Bang et al, 2018 | EUS-BD: 30/33 (90.91) | EUS-BD: 32/33 (96.97) | EUS-BD: 7/33 (21.21) | EUS-BD: Abdominal pain (5), Acute cholecystitis, moderate (1), Bile peritonitis (1) |
| | ERCP: 32/34 (94.12) | ERCP: 31/34 (91.18) | ERCP: 5/34 (14.71) | ERCP: Abdominal pain, mild (3), Pancreatitis (1), Cholangitis (1) |
| Park et al, 2018 | EUS-BD: 13/14 (92.86) | EUS-BD: 13/13 (100.00) | EUS-BD: 2/14 (14.29) | EUS-BD: Stent food impaction (2) |
| | ERCP: 14/14 (100.00) | ERCP: 13/14 (92.86) | ERCP: 4/13 (30.77) | ERCP: Stent occlusion (4) |
| Nakai et al, 2018 | EUS-BD: 33/34 (97.06) | EUS-BD: 33/33 (100.00) | EUS-BD: 5/34 (14.71) | EUS-BD: Abdominal pain, mild (2), Cholecystitis (3) |
| | ERCP: 25/25 (100.00) | ERCP: 25/25 (100.00) | ERCP: 6/25 (24.00) | ERCP: Pancreatitis (1), Cholecystitis (4), Liver abscess (1) |
| Yamao et al, 2018 | EUS-BD: 14/14 (100.00) | EUS-BD: 13/14 (100.00) | EUS-BD: 8/14 (57.14) | EUS-BD: Cholangitis (4), Stent migration (1), Peritonitis (2), Cholecystitis (1) |
| | ERCP: 14/25 (56.00) | ERCP: 13/25 (52.00) | ERCP: 8/25 (32.00) | ERCP: Pancreatitis (2), Pneumoperitoneum/perforation (1), Cholangitis (5) |

Supplemental Fig. 1a technical success rate for EUS-BD for treatment of distal malignant biliary obstruction: only randomized controlled trials, excluding low-quality studies. b Clinical success rate for EUS-BD for treatment of distal malignant biliary obstruction: only randomized controlled trials, excluding low-quality studies. c Adverse event rate for EUS-BD for treatment of distal malignant biliary obstruction: only randomized controlled trials, excluding low-quality studies. d Reintervention rate for EUS-BD for treatment of distal malignant biliary obstruction: only randomized controlled trials, excluding low-quality studies.

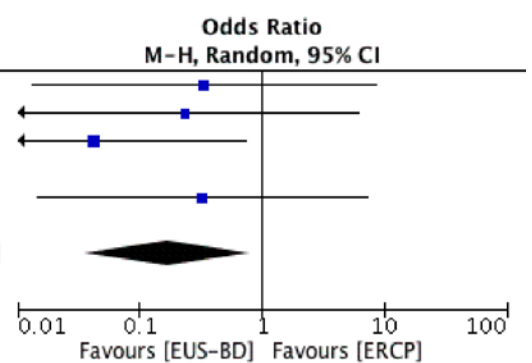


Supplemental Fig. 2 a Technical success rate for EUS-BD for treatment of distal malignant biliary obstruction: observational studies only. **b** Clinical success rate for EUS-BD for treatment of distal malignant biliary obstruction: observational studies only. **c** Adverse event rate for EUS-BD for treatment of distal malignant biliary obstruction: observational studies only. **d** Reintervention rate for EUS-BD for treatment of distal malignant biliary obstruction: observational studies only.

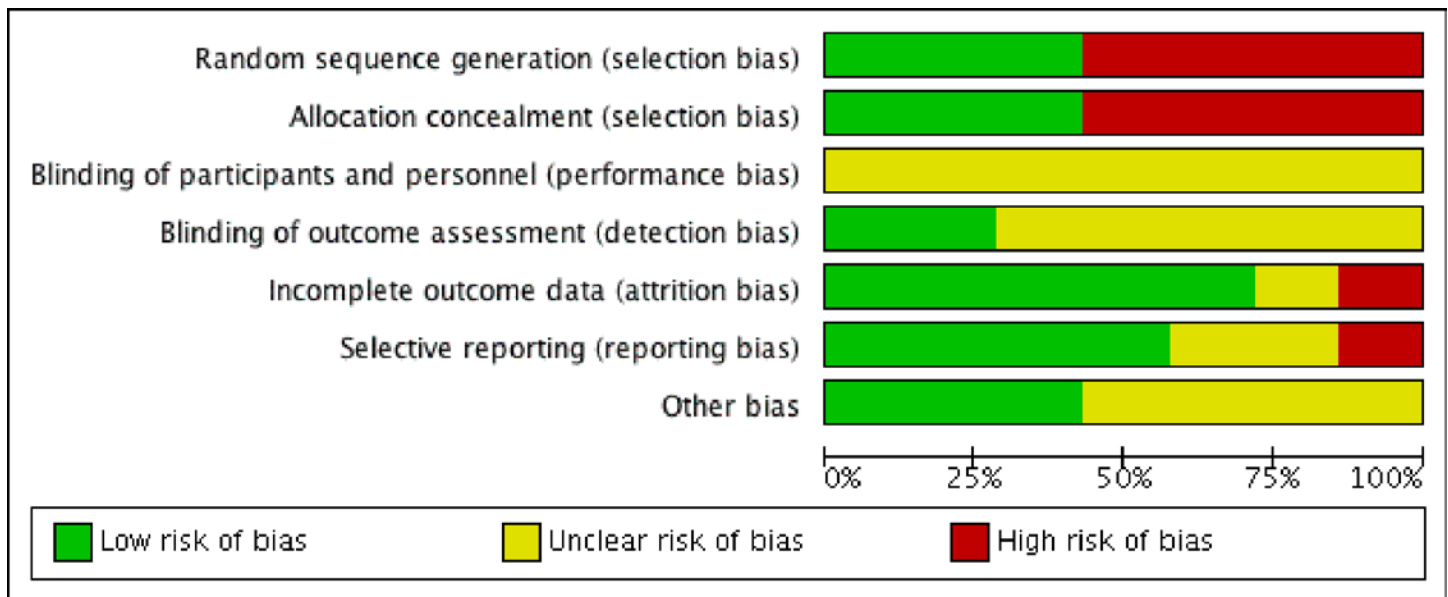


Supplemental Fig. 3 Comparative rate of post-procedure pancreatitis of EUS-BD versus ERCP for treatment of distal malignant biliary obstruction.

| Study or Subgroup | EUS-BD | | ERCP | | Weight | Odds Ratio M-H, Random, 95% CI | Odds Ratio M-H, Random, 95% CI |
|---|--------|------------|--------|------------|---------------|-----------------------------------|-----------------------------------|
| | Events | Total | Events | Total | | | |
| Bang et al 2018 | 0 | 33 | 1 | 34 | 23.0% | 0.33 [0.01, 8.48] | |
| Nakai et al 2018 | 0 | 34 | 1 | 25 | 22.9% | 0.24 [0.01, 6.06] | |
| Paik et al 2018 | 0 | 64 | 9 | 61 | 29.2% | 0.04 [0.00, 0.75] | |
| Park et al 2018 | 0 | 14 | 0 | 14 | | Not estimable | |
| Yamao et al 2018 | 0 | 14 | 2 | 25 | 24.9% | 0.32 [0.01, 7.24] | |
| Total (95% CI) | | 159 | | 159 | 100.0% | 0.17 [0.04, 0.79] | |
| Total events | 0 | | 13 | | | | |
| Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 1.37$, $df = 3$ ($P = 0.71$); $I^2 = 0\%$ | | | | | | | |
| Test for overall effect: $Z = 2.25$ ($P = 0.02$) | | | | | | | |



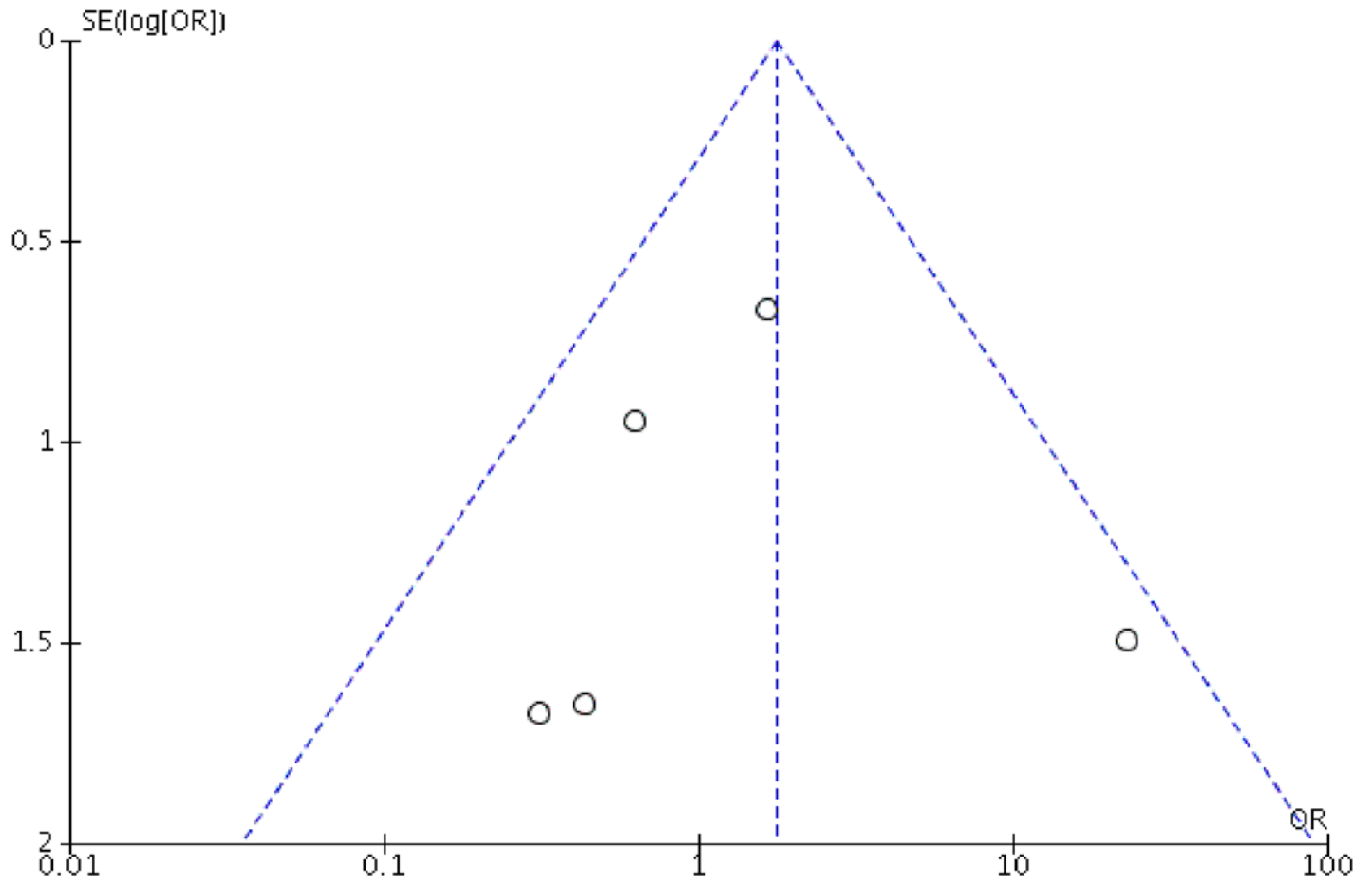
Supplemental Fig. 4 Risk of bias summary: review authors' judgements about each risk of bias item for each included study.



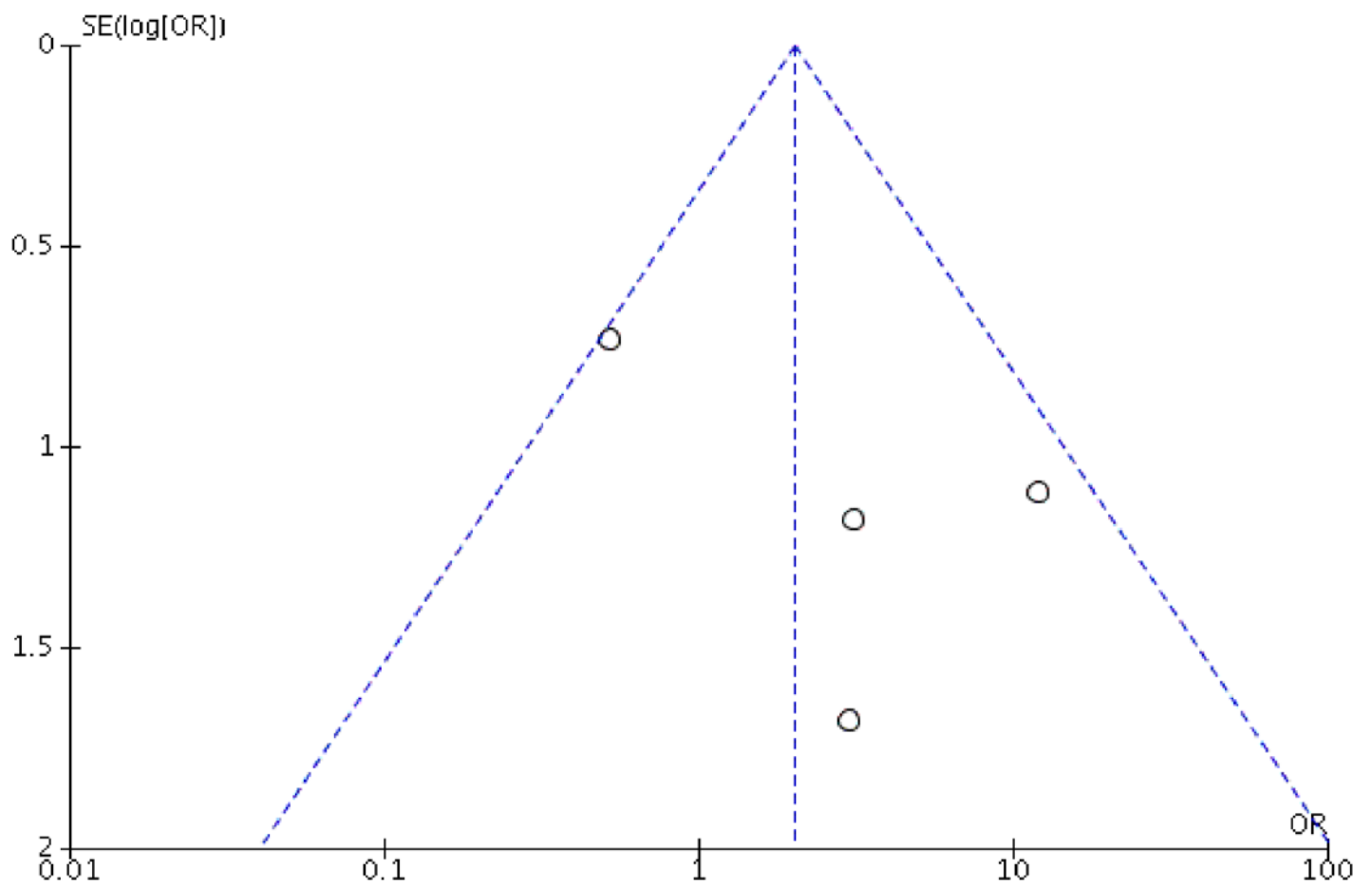
Supplemental Fig. 5 Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

| | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|------------------|---|---|---|---|--|--------------------------------------|------------|
| Bang et al 2018 | + | + | ? | ? | + | + | + |
| Hara et al 2011 | - | - | ? | + | + | ? | ? |
| Hara et al 2013 | - | - | ? | + | ? | ? | ? |
| Nakai et al 2018 | - | - | ? | ? | + | - | ? |
| Paik et al 2018 | + | + | ? | ? | + | + | + |
| Park et al 2018 | + | + | ? | ? | + | + | + |
| Yamao et al 2018 | - | - | ? | ? | - | + | ? |

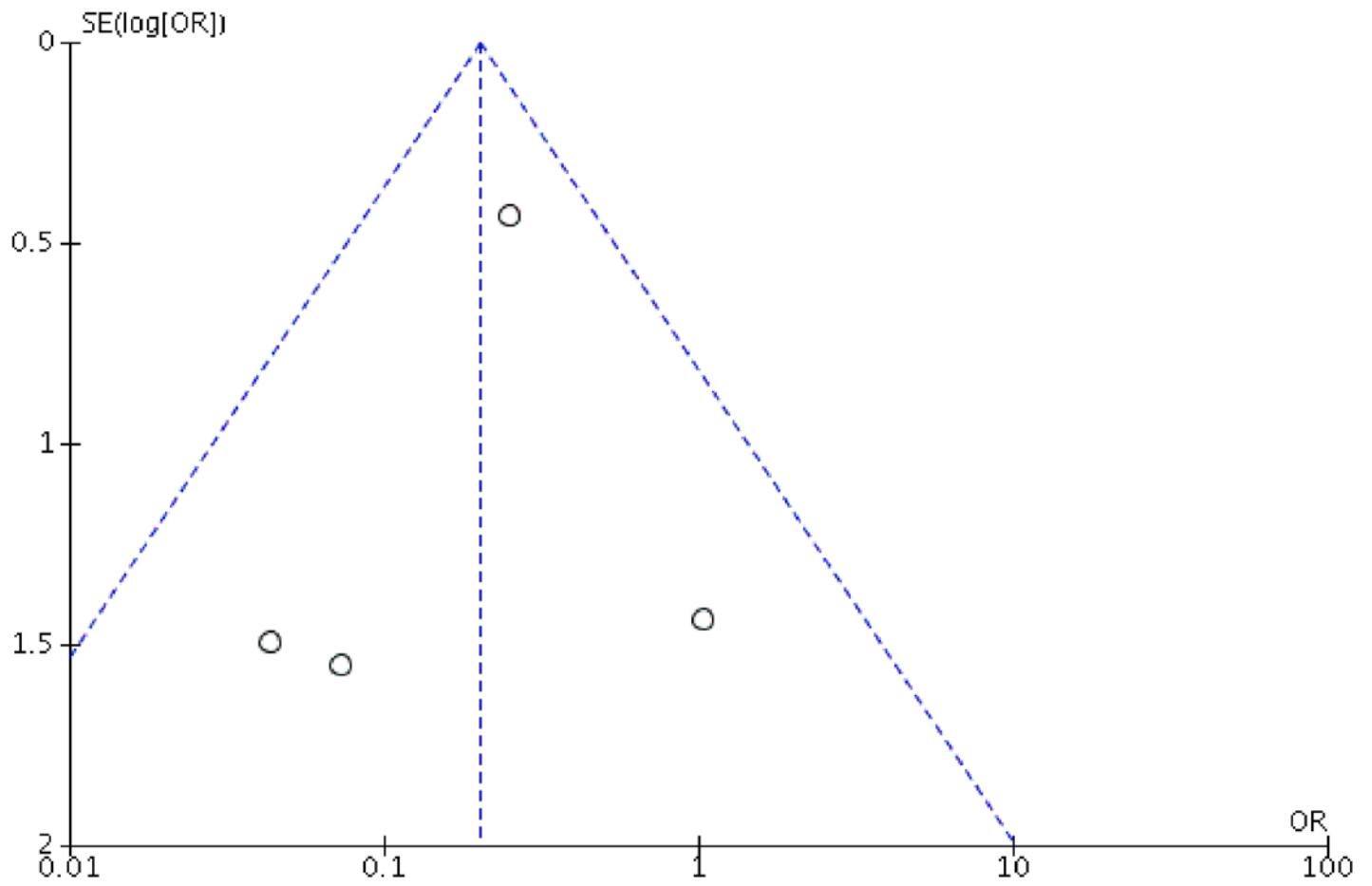
Supplemental Fig. 6 Risk of publication bias funnel plot for included studies that examined technical success for EUS-BD for treatment of distal malignant biliary obstruction.



Supplemental Fig. 7 Risk of publication bias funnel plot for included studies that examined clinical success for EUS-BD for treatment of distal malignant biliary obstruction.



Supplemental Fig. 8 risk of publication bias funnel plot for included studies that examined reintervention rate for EUS-BD for treatment of distal malignant biliary obstruction.



Supplemental Fig. 9 Risk of Publication Bias Funnel Plot for Included Studies That Examined Adverse Events for EUS-BD for Treatment of Distal Malignant Biliary Obstruction

