Outcomes After Bankart Repair vs. Bankart plus Remplissage: Systematic Review and Meta-Analysis

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Disclosures

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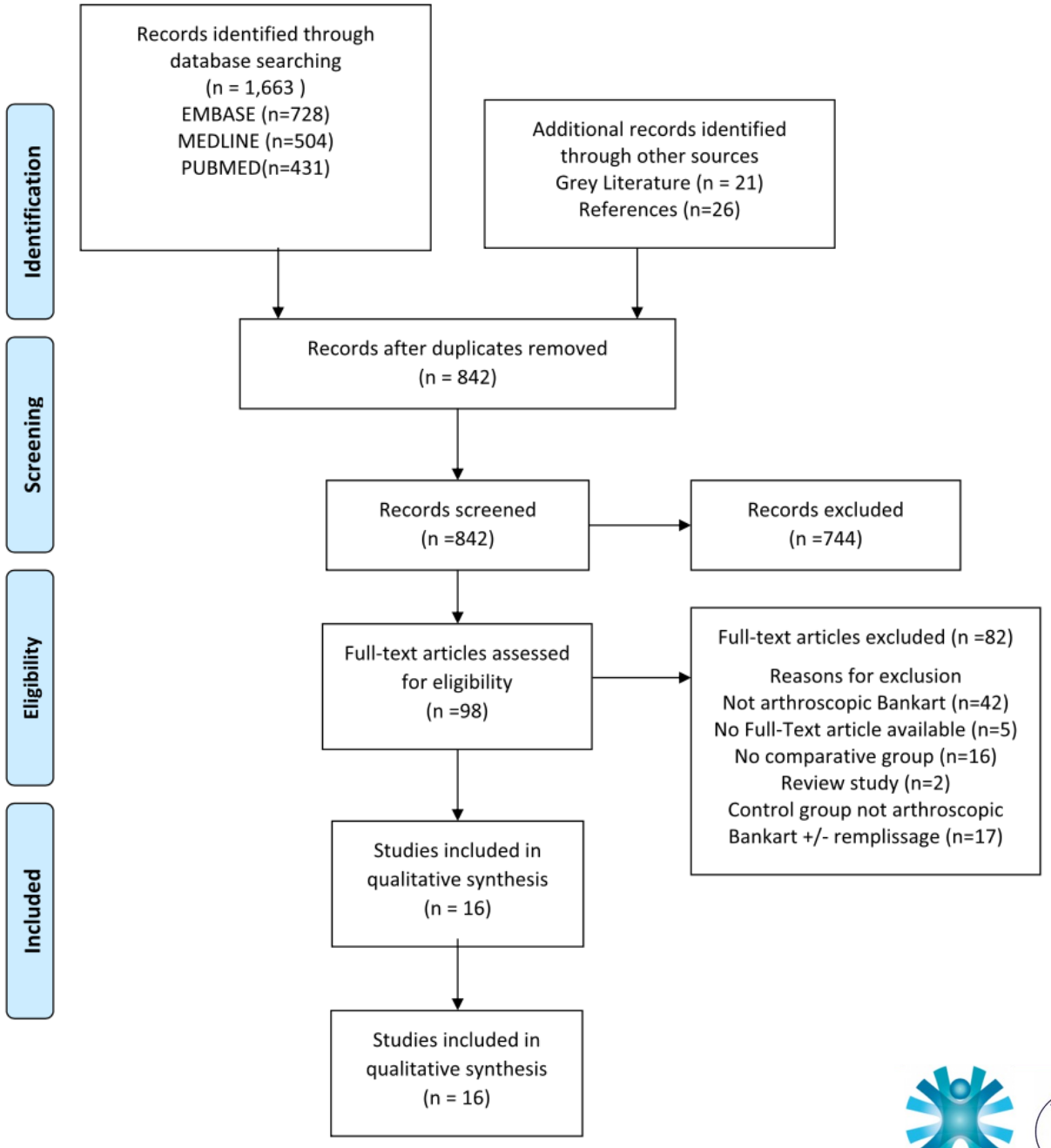
Objectives

- **Recurrent instability measures**
  - Recurrent dislocation
  - Subjective instability
  - Revision surgery
- **Range of Motion**
  - External rotation (side/abduction)
  - Forward Flexion
- **Functional Outcomes**
  - American Shoulder and Elbow Surgeons (ASES) Score
  - Single Assessment Numeric Evaluation (SANE) Score
- **Return to Sport**

Methods

- PRISMA Guidelines
- Inclusion:
  - Level I-III (comparative)
  - Reporting instability, functional and range of motion outcomes
  - On and Off-Track
- MINORS/GRADE
- Random-effects meta-analysis



Results

- 16 studies
  - 1 level I
  - 2 level II
  - 13 level III

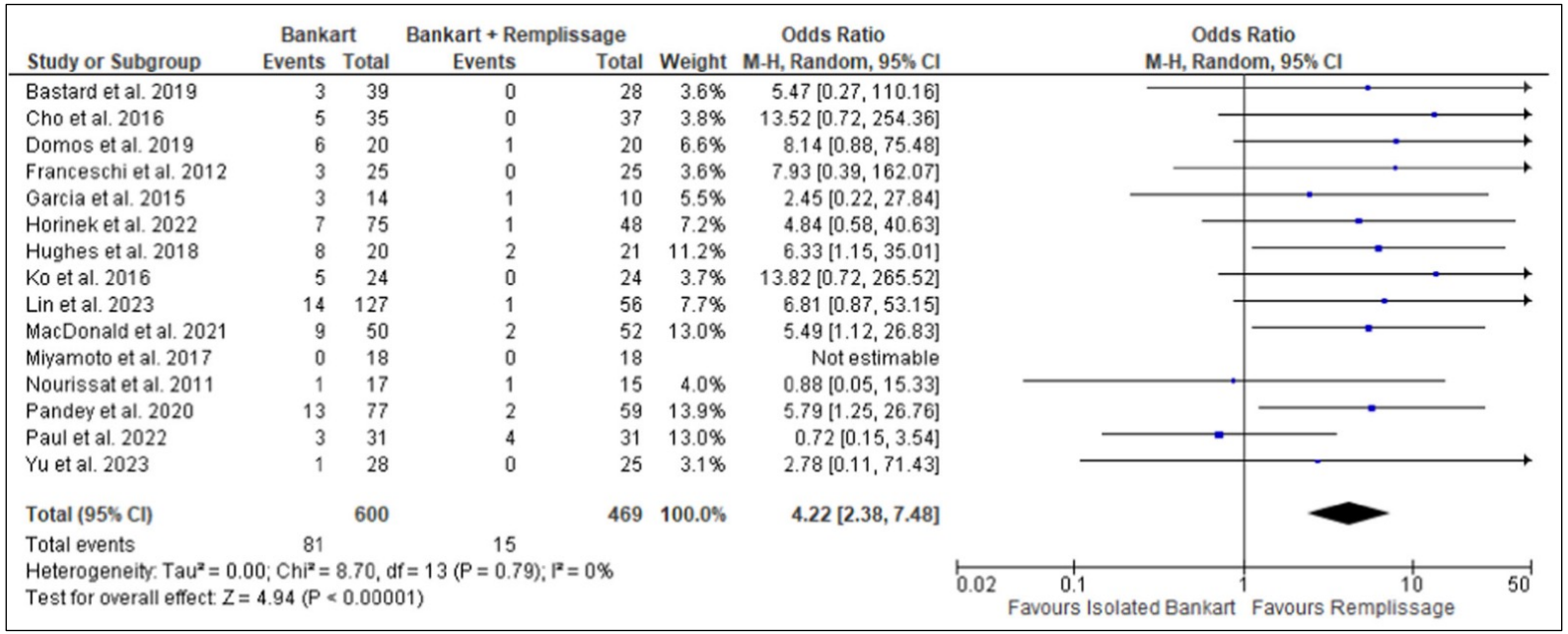
- 1,211 patients
  - 507 R
    - Mean age: 27 years
    - Follow-up: 35.8 months
  - 704 B
    - Mean age: 26.2 years
    - Follow-up: 37.9 months

Study	% Glenoid bone loss (R)	% Glenoid bone loss (B)	Hill-Sachs lesion size (R)	Hill-Sachs lesion size (B)	Engaging Hill-Sachs n (%) (R)	Engaging Hill-Sachs n (%) (B)
Nourissat et al. 2011	NA	NA	NA	NA	NA	NA
Franceschi et al. 2012	Mean 14.9% (5 patients)	Mean 16.1% (6 patients)	NA	NA	25 (100%)	25 (100%)
Garcia et al. 2015	Mean <1%	Mean 5.3%	283.79 (192.6 mm^3)	310.22 (240.5 mm^3)	10 (100%)	14 (100%)
Cho et al. 2016	8.5% (+/- 5.8)	9.9% (+/- 6.9)	Depth 6.8 mm (+/-1.7)	Depth 6 mm (+/- 1.5)	37 (100%)	35 (100%
Ko et al. 2016	<25%	<25%	439.9 (+/- 59 mm^2)	440.6 (+/- 57 mm^2)	24 (100%)	24 (100)
Miyamoto et al. 2017	13% (+/- 5.6)	7.3% (+/- 4.7)	NA	NA	12 (66.6%)	0 (0%)
Hughes et al. 2018	<20%	<20%	5.9 (+/- 5.3) mm X 16.1 (+/- 5.7) mm	4 (+/- 1.5) mm X 14.5 (+/- 4.4) mm	6 (32%)	3 (15%)
Bastard et al. 2019	NA	NA	NA	NA	NA	NA
Domos et al. 2019	<20%	<20%	NA	NA	0%	0%
Pandey et al. 2020	13.8% (+/- 4.7)	8.8% (+/-5.4)	NA	NA	59 (100%)	30 (39%)
Frantz et al. 2020	NA	NA	Hill Sachs > 20% humeral head size: 9 (24%)	Hill Sachs > 20% humeral head size: 0 (0%)	NA	NA
MacDonald et al. 2021	<15%	<15%	15.1% humeral bone loss (4.2%)	15.8% humeral bone loss (4.3%)	52 (100%)	50 (100%)
Horinek et al. 2022	6.1% (4.9)	2.5% (4.1)	14.5 width (3.7) X 8.6 depth (3.6) mm	2.7 width (4.5) X 1.5 depth (2.5)	3 (6%)	1 (1%)
Paul et al. 2022	11% (4)	11% (5)	NA	NA	26 (84%)	1 (3%)
Lin et al. 2023	5.3% (4.8)	3.2% (4.2)	14.9 mm (2.9) length	4.3 mm (5.1) length	0 (0%)	0 (0%)
Yu et al. 2023	7.8% (+/- 5.6)	5.9% (+/- 3.1)	16.1 mm (+/- 2.8) interval X 3.4 mm (+/- 1.4) depth	14.9 mm (+/- 5.1) interval X 2.6 mm (+/- 1.4) depth	0 (0%)	0 (0%)

Bankart plus remplissage (R), isolated Bankart repair (B)

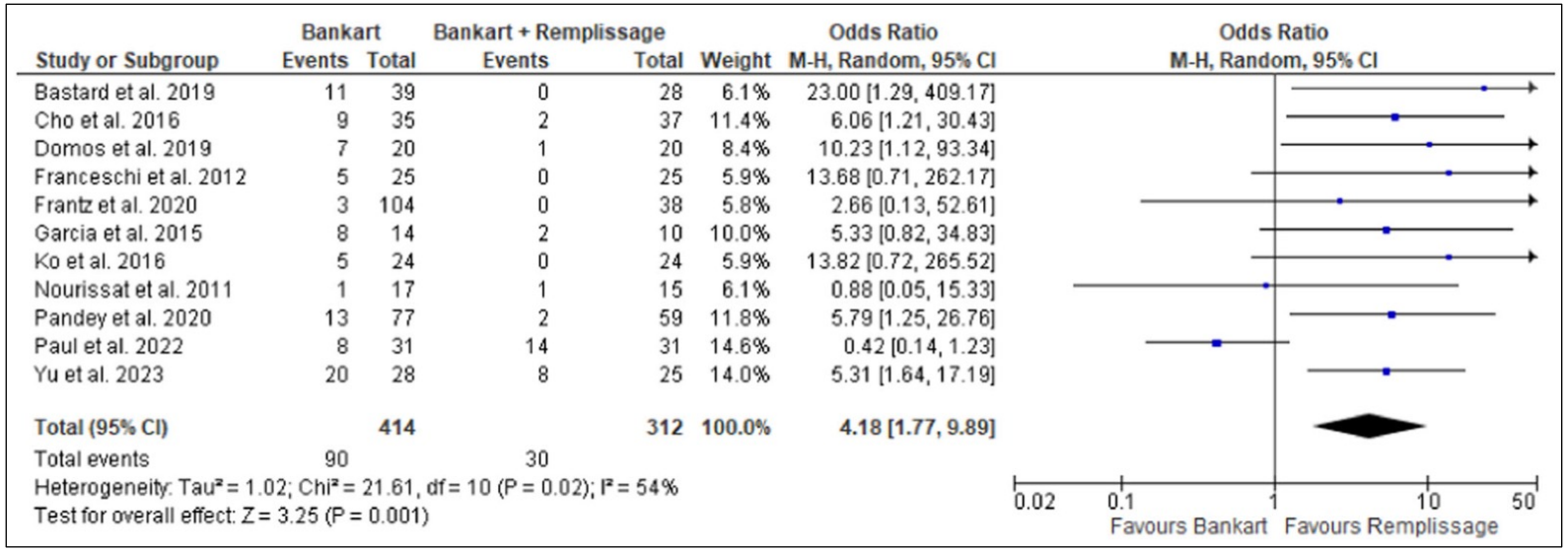
Results

- **Recurrent Dislocation**
- **Subjective Instability**
- Revision Surgery
  - OR=3.36 (8% vs. 2.1%)
  - p=0.003
  - I^2=4%



Study or Subgroup	Bankart Events	Bankart Total	Bankart + Remplissage Events	Bankart + Remplissage Total	Weight	Odds Ratio M-H, Random, 95% CI
Bastard et al. 2019	3	39	0	28	3.6%	5.47 [0.27, 110.16]
Cho et al. 2016	5	35	0	37	3.8%	13.52 [0.72, 254.36]
Domos et al. 2019	6	20	1	20	6.6%	8.14 [0.88, 75.48]
Franceschi et al. 2012	3	25	0	25	3.6%	7.93 [0.39, 162.07]
Garcia et al. 2015	3	14	1	10	5.5%	2.45 [0.22, 27.84]
Horinek et al. 2022	7	75	1	48	7.2%	4.84 [0.58, 40.63]
Hughes et al. 2018	8	20	2	21	11.2%	6.33 [1.15, 35.01]
Ko et al. 2016	5	24	0	24	3.7%	13.82 [0.72, 265.52]
Lin et al. 2023	14	127	1	56	7.7%	6.81 [0.87, 53.15]
MacDonald et al. 2021	9	50	2	52	13.0%	5.49 [1.12, 26.83]
Miyamoto et al. 2017	0	18	0	18		Not estimable
Nourissat et al. 2011	1	17	1	15	4.0%	0.88 [0.05, 15.33]
Pandey et al. 2020	13	77	2	59	13.9%	5.79 [1.25, 26.76]
Paul et al. 2022	3	31	4	31	13.0%	0.72 [0.15, 3.54]
Yu et al. 2023	1	28	0	25	3.1%	2.78 [0.11, 71.43]
Total (95% CI)		**600**		**469**	**100.0%**	**4.22 [2.38, 7.48]**
Total events	81		15			

Heterogeneity: Tau² = 0.00; Chi² = 8.70, df = 13 (P = 0.79); I² = 0%
Test for overall effect: Z = 4.94 (P < 0.00001)



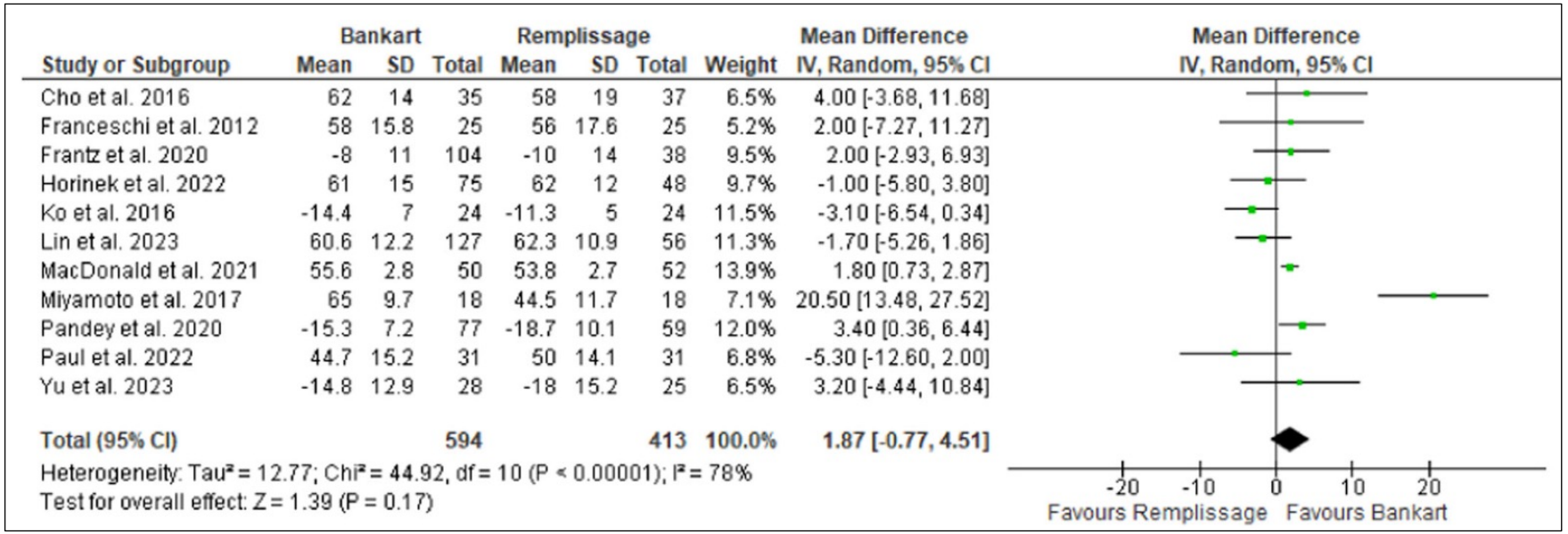
Study or Subgroup	Bankart Events	Bankart Total	Bankart + Remplissage Events	Bankart + Remplissage Total	Weight	Odds Ratio M-H, Random, 95% CI
Bastard et al. 2019	11	39	0	28	6.1%	23.00 [1.29, 409.17]
Cho et al. 2016	9	35	2	37	11.4%	6.06 [1.21, 30.43]
Domos et al. 2019	7	20	1	20	8.4%	10.23 [1.12, 93.34]
Franceschi et al. 2012	5	25	0	25	5.9%	13.68 [0.71, 262.17]
Frantz et al. 2020	3	104	0	38	5.8%	2.66 [0.13, 52.61]
Garcia et al. 2015	8	14	2	10	10.0%	5.33 [0.82, 34.83]
Ko et al. 2016	5	24	0	24	5.9%	13.82 [0.72, 265.52]
Nourissat et al. 2011	1	17	1	15	6.1%	0.88 [0.05, 15.33]
Pandey et al. 2020	13	77	2	59	11.8%	5.79 [1.25, 26.76]
Paul et al. 2022	8	31	14	31	14.6%	0.42 [0.14, 1.23]
Yu et al. 2023	20	28	8	25	14.0%	5.31 [1.64, 17.19]
Total (95% CI)		**414**		**312**	**100.0%**	**4.18 [1.77, 9.89]**
Total events	90		30			

Heterogeneity: Tau² = 1.02; Chi² = 21.61, df = 10 (P = 0.02); I² = 54%
Test for overall effect: Z = 3.25 (P = 0.001)

Odds Ratio (OR), p-value (p), heterogeneity (I^2)

Results

- **ER at side**
  - Subgroup on post-operative values also not significant
- ER in abduction
  - No significance reached in 4
- Forward Flexion
  - No significance reached in 6 studies



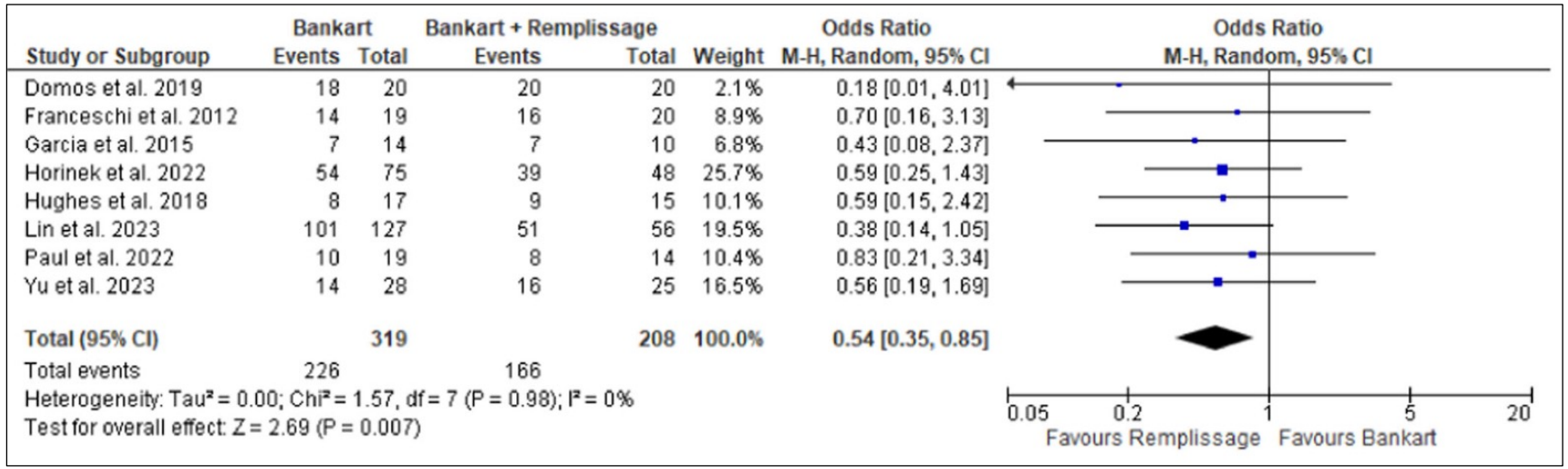
Study or Subgroup	Bankart Mean	Bankart SD	Bankart Total	Remplissage Mean	Remplissage SD	Remplissage Total	Weight	Mean Difference IV, Random, 95% CI
Cho et al. 2016	62	14	35	58	19	37	6.5%	4.00 [-3.68, 11.68]
Franceschi et al. 2012	58	15.8	25	56	17.6	25	5.2%	2.00 [-7.27, 11.27]
Frantz et al. 2020	-8	11	104	-10	14	38	9.5%	2.00 [-2.93, 6.93]
Horinek et al. 2022	61	15	75	62	12	48	9.7%	-1.00 [-5.80, 3.80]
Ko et al. 2016	-14.4	7	24	-11.3	5	24	11.5%	-3.10 [-6.54, 0.34]
Lin et al. 2023	60.6	12.2	127	62.3	10.9	56	11.3%	-1.70 [-5.26, 1.86]
MacDonald et al. 2021	55.6	2.8	50	53.8	2.7	52	13.9%	1.80 [0.73, 2.87]
Miyamoto et al. 2017	65	9.7	18	44.5	11.7	18	7.1%	20.50 [13.48, 27.52]
Pandey et al. 2020	-15.3	7.2	77	-18.7	10.1	59	12.0%	3.40 [0.36, 6.44]
Paul et al. 2022	44.7	15.2	31	50	14.1	31	6.8%	-5.30 [-12.60, 2.00]
Yu et al. 2023	-14.8	12.9	28	-18	15.2	25	6.5%	3.20 [-4.44, 10.84]
Total (95% CI)			**594**			**413**	**100.0%**	**1.87 [-0.77, 4.51]**

Heterogeneity: Tau² = 12.77; Chi² = 44.92, df = 10 (P < 0.00001); I² = 78%
Test for overall effect: Z = 1.39 (P = 0.17)

External rotation (ER)

Results

- **Return to pre-injury level of sport**
- ASES Score
  - MD=-2.43
  - p=0.04
  - I^2=0%
- SANE Score
  - No significant difference



Mean difference (MD), p-value (p), heterogeneity (I^2), American Shoulder and Elbow (ASES), Single Assessment Numeric Evaluation (SANE)

Limitations

- Heterogeneity in glenoid bone loss and Hill-Sachs lesion size
- Differences in methods to quantify bone loss; differences in reporting of Hill-Sachs lesion size
- Level III studies (retrospective in nature) susceptible to bias
- No reporting of clinical significance outcomes (CSO)

Conclusion

- Lower rates of recurrent instability measures
  - Recurrent dislocation, subjective instability, and revision surgery
- No significant difference in post-operative range of motion between procedures
- Higher rates of return to pre-injury level of sport

Thanks!

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