4% Annual Revision Rate in Ankle Distraction for Ankle Osteoarthritis

A Systematic Review and Meta-Analysis

Julian J. Hollander[1,2,3], Liam D.A. Paget[1,2,3], Jari Dahmen[1,2,3], Tobias Stornebrink[1,2,3], Quinten G.H. Rikken[1,2,3], Inger N Sierevelt[4,5], Gino M.M.J. Kerkhoffs[1,2,3], Sjoerd A.S. Stufkens[1,2,3]

1) Department of Orthopaedic Surgery and Sports Medicine, Amsterdam Movement Sciences, Amsterdam UMC, Location AMC, University of Amsterdam, Amsterdam, The Netherlands

2) Academic Center for Evidence Based Sports Medicine, Amsterdam UMC, Amsterdam, The Netherlands

3) Amsterdam Collaboration for Health and Safety in Sports, International Olympic Committee Research Center, Amsterdam UMC, Amsterdam, The Netherlands

4) Department of Orthopaedic Surgery, Xpert Clinics, Laarderhoogtweg 12, 1101 EA Amsterdam, The Netherlands

5) Department of Orthopedic Surgery, Spaarne Gasthuis Academy, Spaarnepoort 1, 2134 TM Hoofddorp, The Netherlands

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Background

Ankle OA severely impact on mental and physical quality of life[1]

Ankle distraction arthroplasty promising alternative to total ankle replacement and ankle arthrodesis[2]

Primary aim: determine annual revision rate after ankle distraction arthroplasty

Secondary aim: overview of PROMs and functional outcomes

Methods

- Literature search MEDLINE, EMBASE, Cochrane library
  - Earliest record – June 2022
- Methodological quality using MINORS criteria[3]

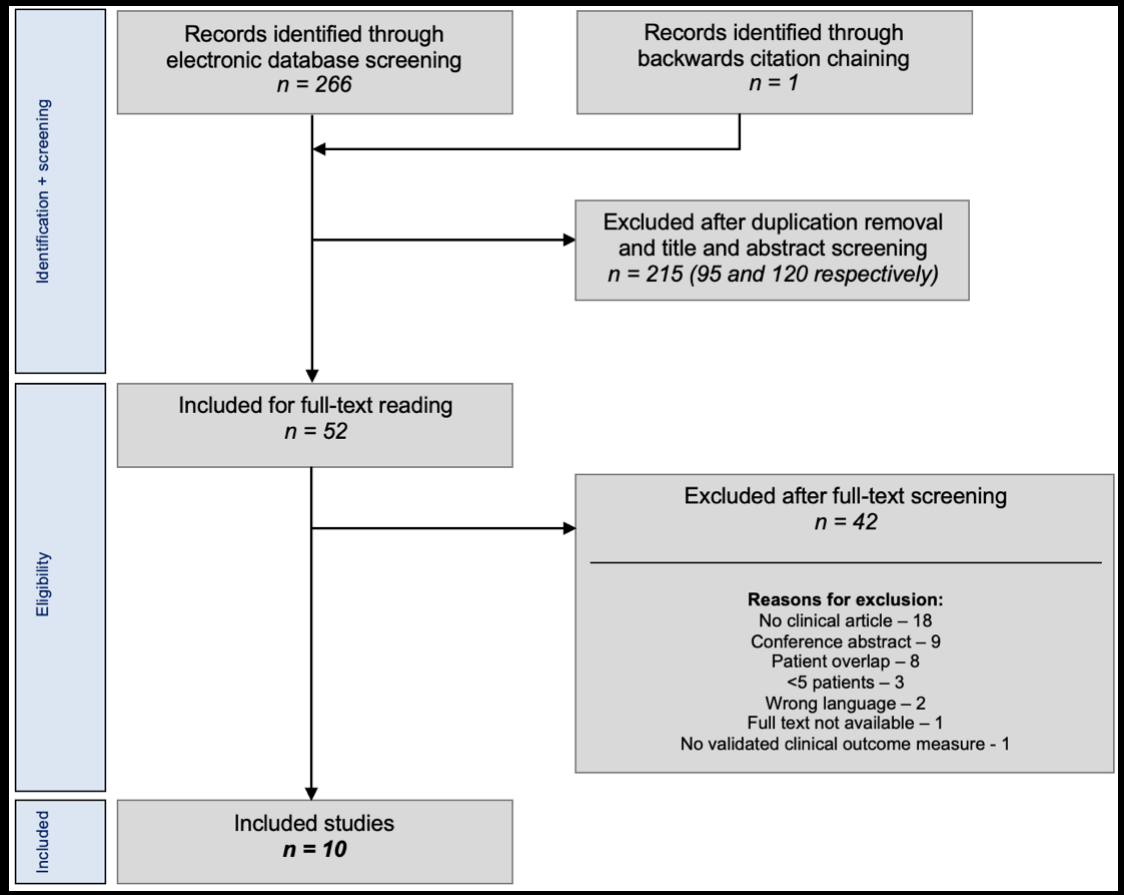
- Primary outcome: annual revision rate
  - Log-transformed and pooled (random effects model)
- Secondary outcomes
  - Sub-analysis: type of fixator; Q-test for significance
    - As primary outcome
  - AOFAS, ROM, complications
    - Simplified pooling technique
    - AOFAS MCID of 12[4]

Results

266 articles → 10 included

602 patients
Mean age: 47 years
Mean follow-up: 36 months

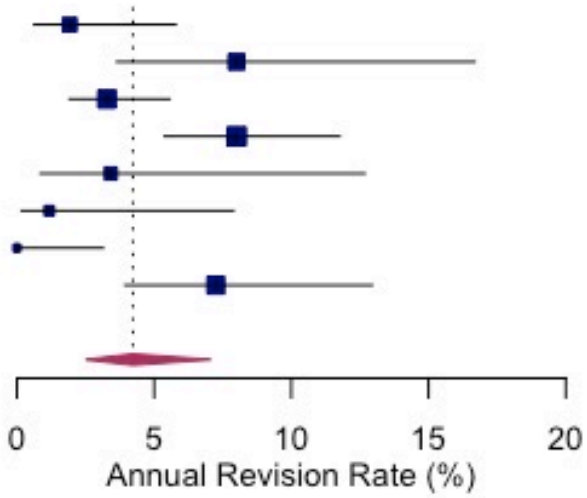
Methodological quality: moderate to fair



Results: primary outcome

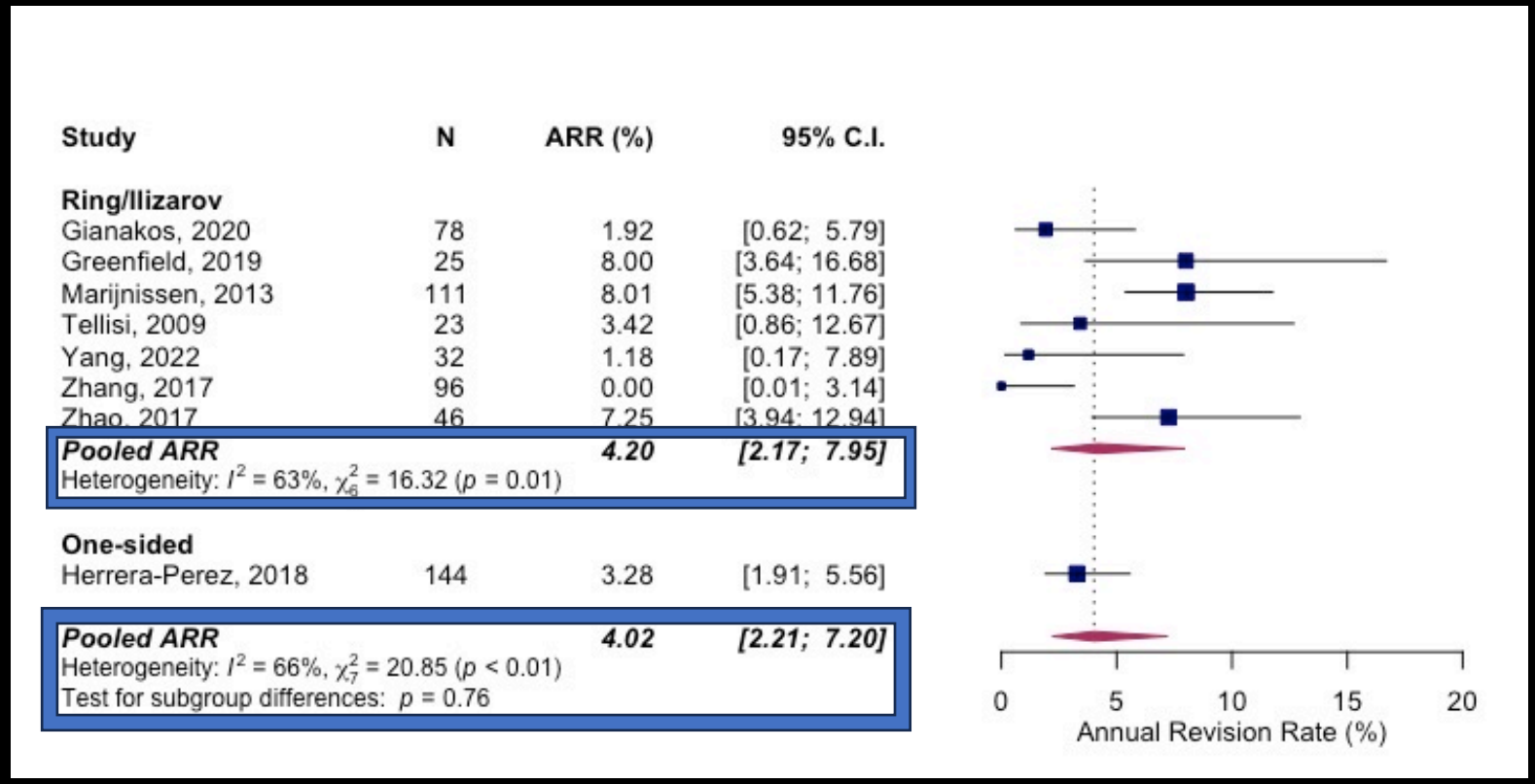
Pooled annual revision rate: 4% (95% CI, 3% - 7%)

Study	N	ARR (%)	95% C.I.
Gianakos, 2020	78	1.92	[0.62; 5.79]
Greenfield, 2019	25	8.00	[3.64; 16.68]
Herrera-Perez, 2018	144	3.28	[1.91; 5.56]
Marijnissen, 2013	111	8.01	[5.38; 11.76]
Tellisi, 2009	23	3.42	[0.86; 12.67]
Yang, 2022	32	1.18	[0.17; 7.89]
Zhang, 2017	96	0.00	[0.01; 3.14]
Zhao, 2017	46	7.25	[3.94; 12.94]
Pooled ARR		***4.23***	***[2.50; 7.05]***
Heterogeneity: I^2 = 66%, χ^2_7 = 20.85 (p < 0.01)			



Results: sub-analysis

Subgroup differences: p = 0.76



Results

AOFAS
- Mean 27-point improvement (from 54 to 80)

ROM Dorsiflexion
- Improved with 5°

ROM Plantarflexion
- Remained 31°

Complication rate
- 41% (95% CI, 35%-48%),
- Of which 77% (95% CI, 67%-85%) were pin-tract infections

Conclusion

Ankle distraction arthroplasty results in…

- Annual revision rate of 4%
- Clinically relevant improved AOFAS scores
- Compliation rate 41%, mainly attributable to pin-tract infections

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