



Comparison of Pegged and Keeled Glenoid Components for Total Shoulder Arthroplasty: A Systematic Review

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BACKGROUND:

Glenohumeral joint arthritis is a large contributor to disability in our population, especially our aging population. Total shoulder arthroplasty (TSA) has been shown to be a very effective treatment modality for this condition. Unfortunately, as hardware ages, the components are susceptible to failure and most commonly, this failure results from glenoid component loosening. To date, there has been insufficient evidence to guide surgeons as to which glenoid design has superior outcomes and results in the lowest failure rate.

OBJECTIVE:

The purpose of this study is to determine whether keeled or pegged cemented glenoid components resulted in fewer complications, lower incidence of radiolucency or symptomatic loosening, or superior clinical outcomes.

METHODS:

A comprehensive search of the following electronic databases: Pubmed, Cochrane, Ovid, and CINAHL (Cumulative Index to Nursing and Allied Health Literature) using the terms “pegged AND keeled glenoid,” “glenoid component,” “pegged versus keeled,” “pegged glenoid,” and “keeled glenoid” in the manuscript title was completed. At the time of the search in July 2016, 3134 citations were identified. Upon review of the titles and abstract of these citations, 88 manuscripts were identified as relevant and were subsequently retrieved for further analysis using the below inclusion and exclusion criteria.

Inclusion Criteria:

- English Language
- Comparison of pegged with keeled glenoid component
- Radiolucency evaluation
- Average follow-up of a minimum of 1 year
- Level of Evidence I, II, or III
- Cemented all-polyethylene glenoid component

Exclusion Criteria:

- Less than 1 year follow-up
- No radiolucency evaluation
- Level of Evidence IV or V
- Animal Studies
- Uncemented or metal-backed glenoid component

Four articles were included in the final analysis with a total of 203 total shoulder arthroplasties comprised of 107 pegged and 96 keeled glenoid components.

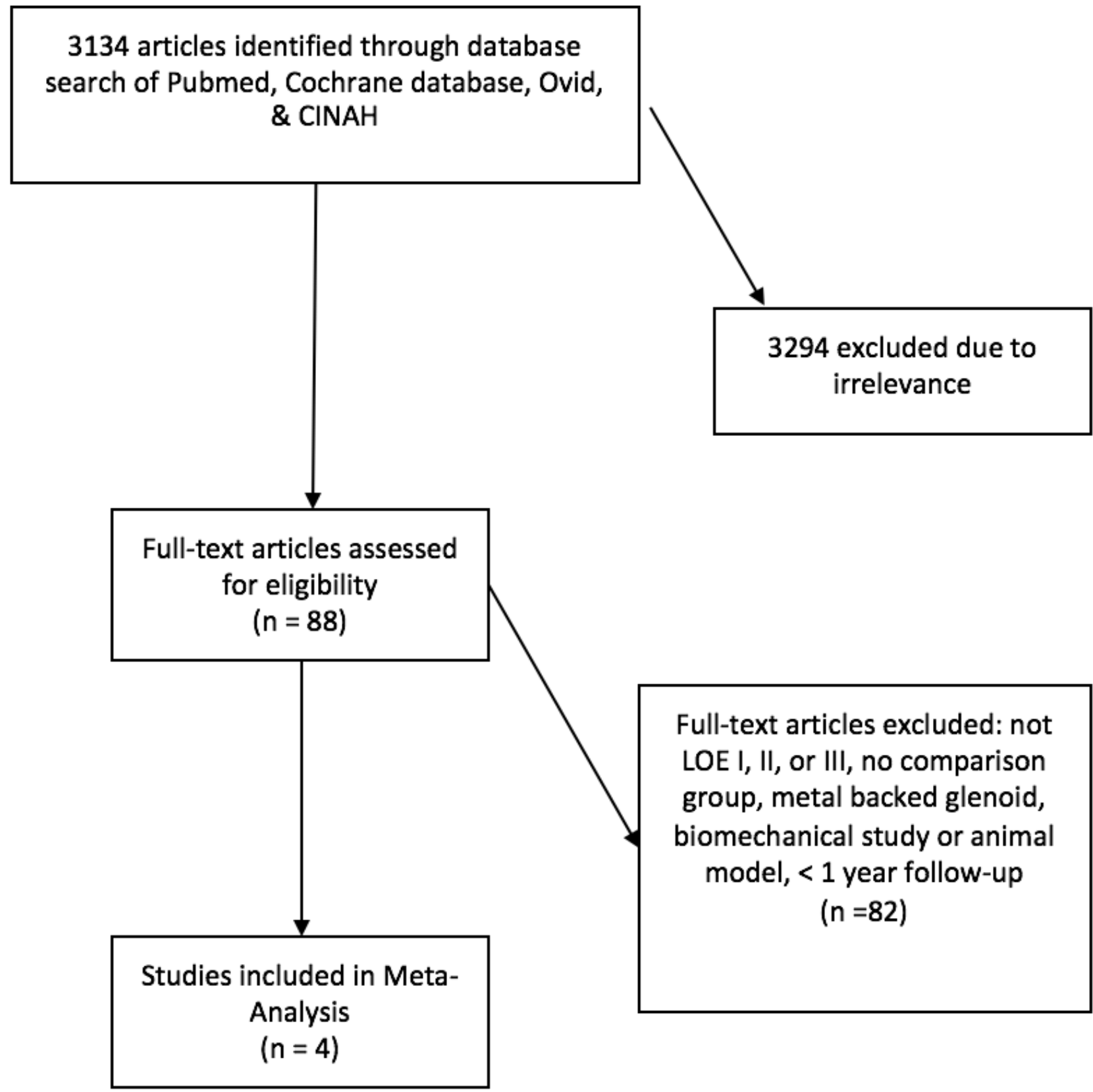


Figure I. PRISMA flow-chart describing the inclusion and exclusion of studies for the present meta-analysis.

Results:

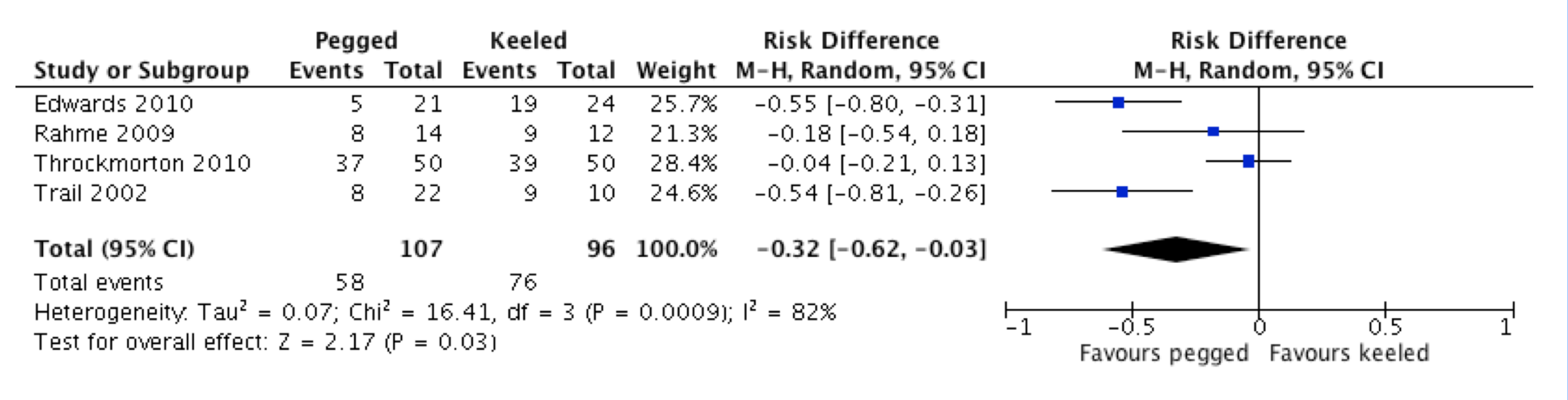


Figure II. Forest plot of radiolucent lines after TSA with pegged and keeled glenoid components. (Of note, 2 of the 26 shoulders in Edwards 2010 study were excluded in radiolucency evaluation due to their component failure.)

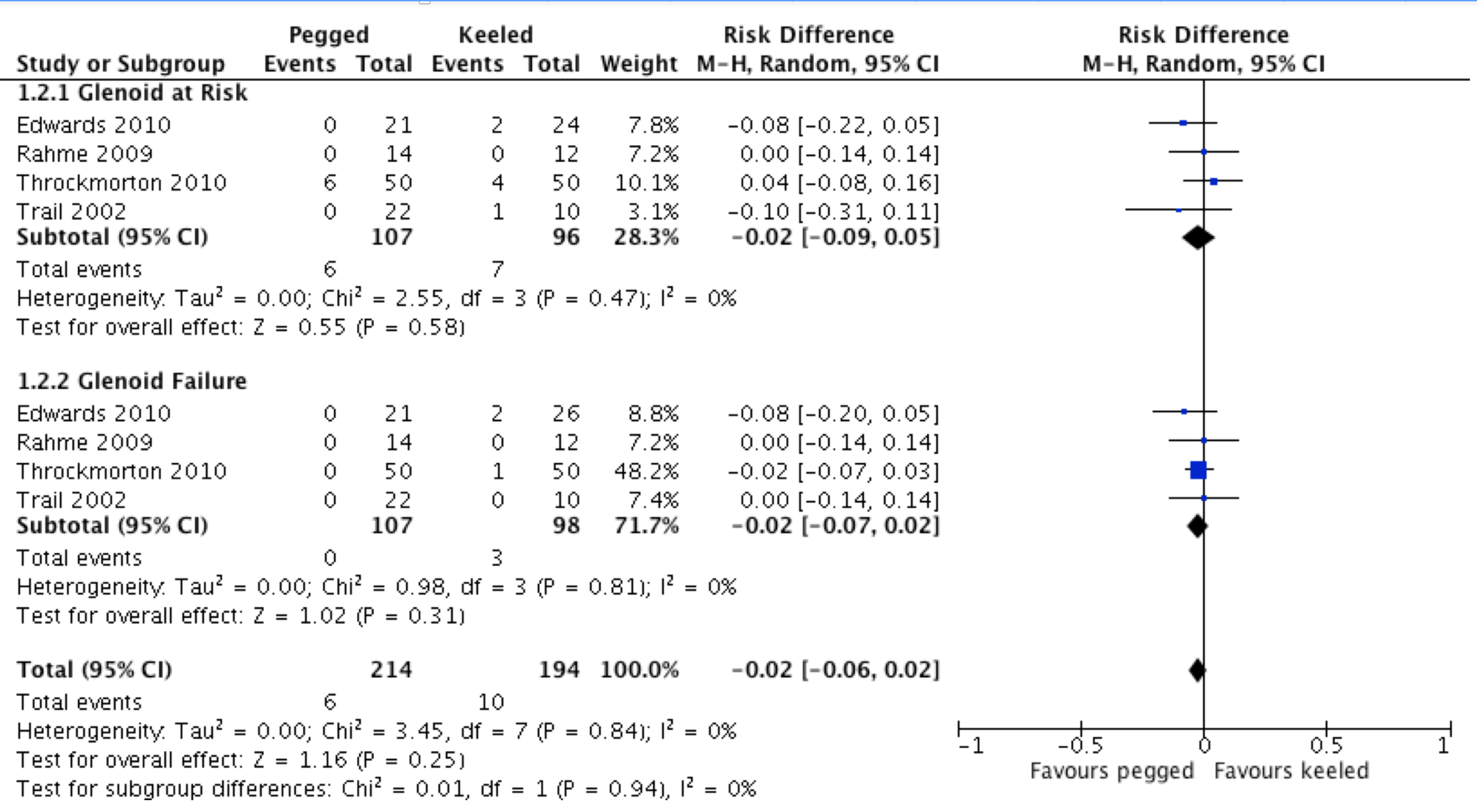


Figure III. Forest plot of radiographically at risk glenoids and glenoid failure after TSA with pegged and keeled glenoid components. (Of note, 2 of the 26 shoulders in Edwards 2010 study were excluded in the “glenoid at risk” evaluation due to their failure.)

RESULTS:

A risk difference forest plot analysis was created comparing the 107 pegged glenoid components to the 96 keeled glenoid components. The pooled risk difference for presence of radiolucent lines favored pegged components -0.32 (95% CI, $-0.62, -0.03$) which was significant ($p = 0.03$). There was no significant difference between pegged and keeled components in the risk of glenoid loosening (RD, -0.02 ; 95% CI, -0.09 to 0.05) or glenoid failures (RD, -0.02 ; 95% CI, -0.07 to 0.02).

CONCLUSION:

In conclusion, the current systematic review demonstrates that keeled glenoid components are more likely to develop radiolucent lines after TSA. There was, however, no difference in the rate of radiographically deemed “at risk” glenoids or revision for glenoid failure between pegged and keeled cemented all-polyethylene components. The paucity of comparative keeled and pegged outcomes data in the literature render detecting differences between the two designs difficult. Further comparative studies are needed to assess the relative rates of glenoid loosening between pegged and keeled glenoid components as well as evaluate standardized clinical outcomes between the groups.

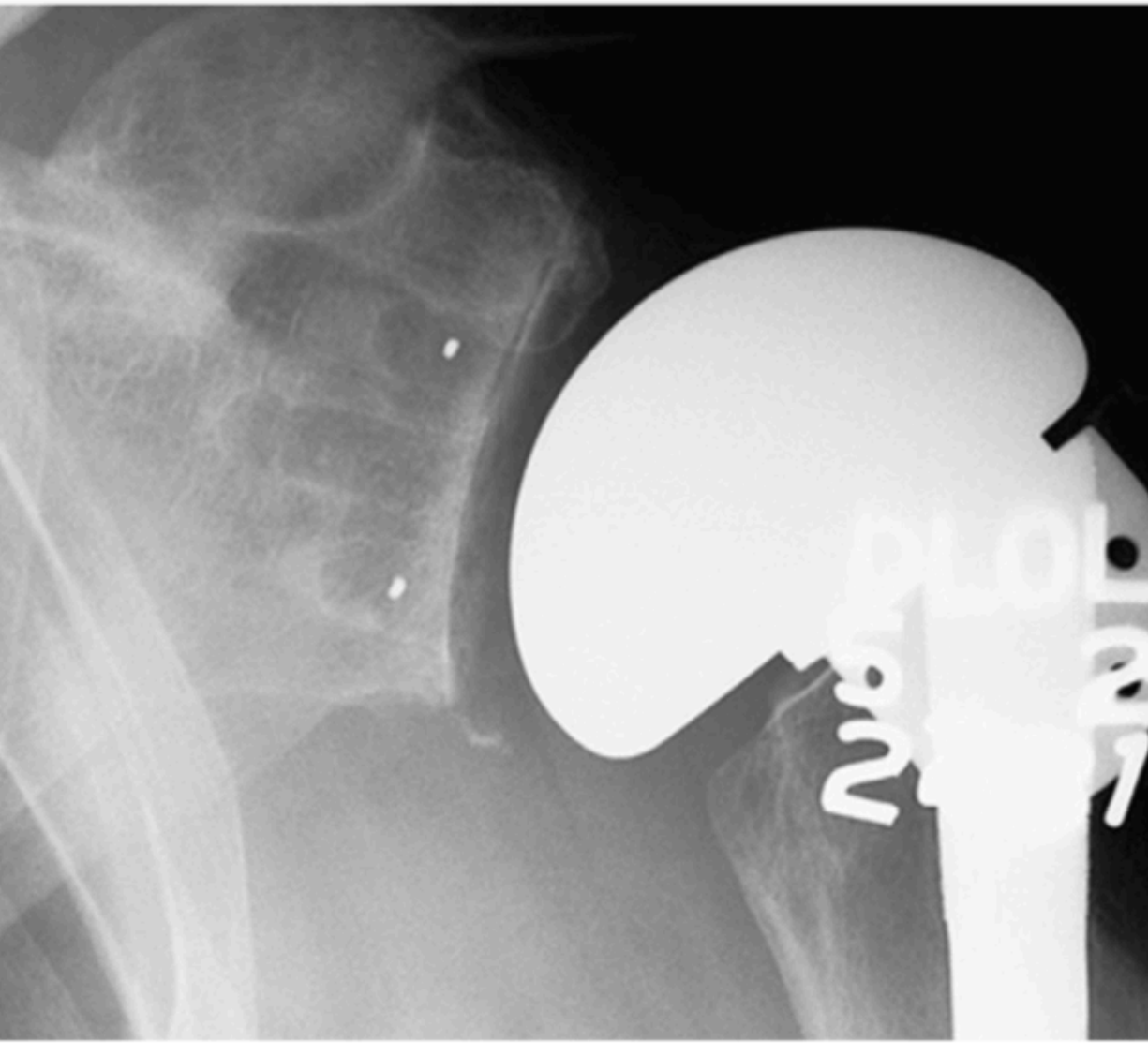


Figure IV. Pegged component with evidence of radiolucency at final follow-up (Throckmorton 2010)

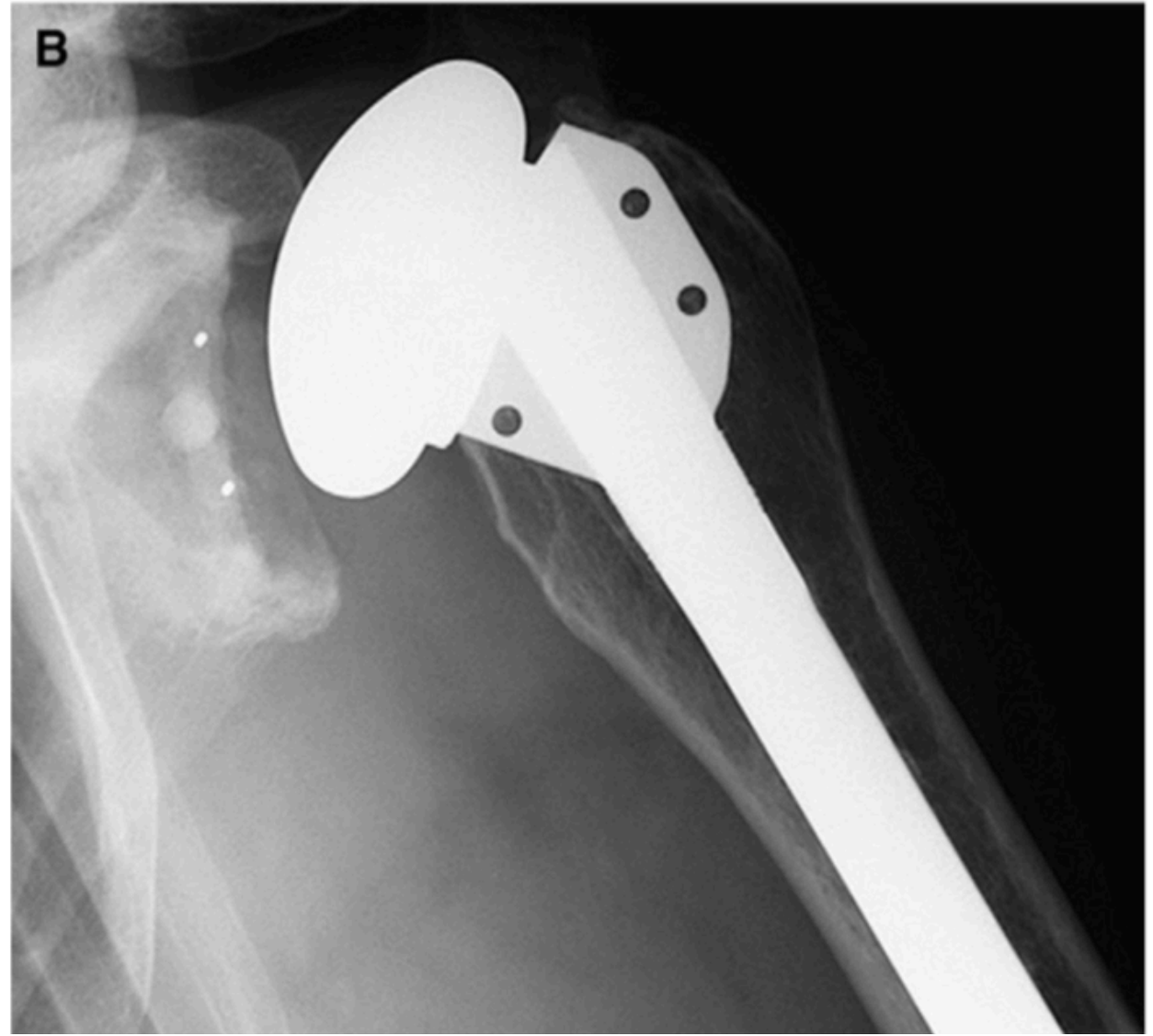


Figure V. Keeled component with no evidence of radiolucency at final follow-up (Throckmorton 2010)

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