



Metal-on-Polyethylene vs All-Cement Articulating Spacers in Two-Stage Revision for Infected Total Knee Arthroplasty. Do Spacer Types Influence Reinfection and Mechanical Failure Rates? A Systematic Review and Meta-Analysis.

Authors

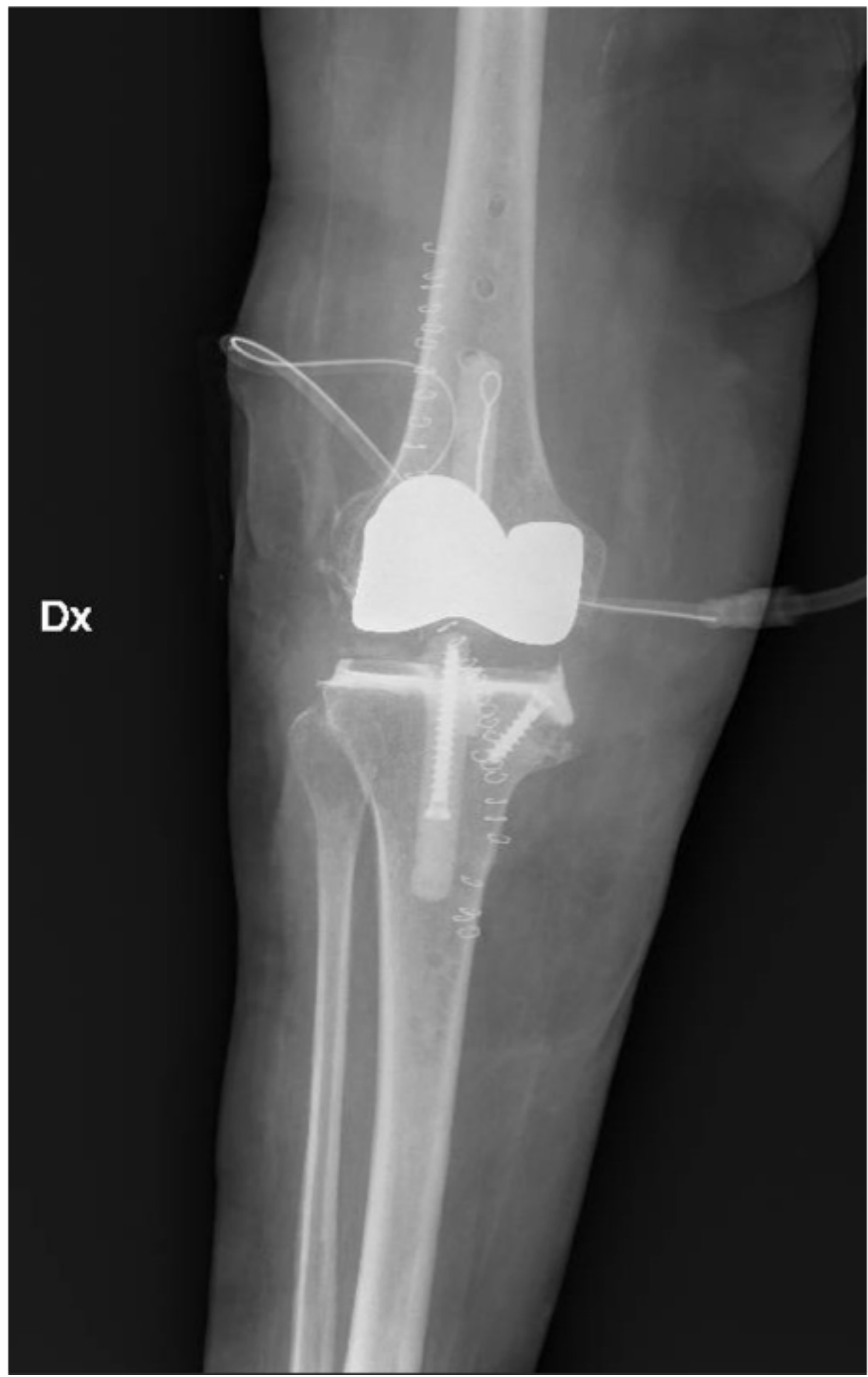
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INTRODUCTION

Periprosthetic joint infection (**PJI**) after total knee arthroplasty (**TKA**) remains one of the most challenging complications in orthopedics, often requiring a two-stage revision procedure. During the interim phase, articulating spacers maintain soft-tissue tension and deliver local antibiotics. Two main designs are currently used: metal-on-polyethylene and all-cement molded spacers. While both aim to combine infection control and joint stability, evidence comparing their performance remains inconclusive.

AIM

This systematic review and meta-analysis evaluated outcomes and complication rates between the two spacer types in infected **TKA** revisions.



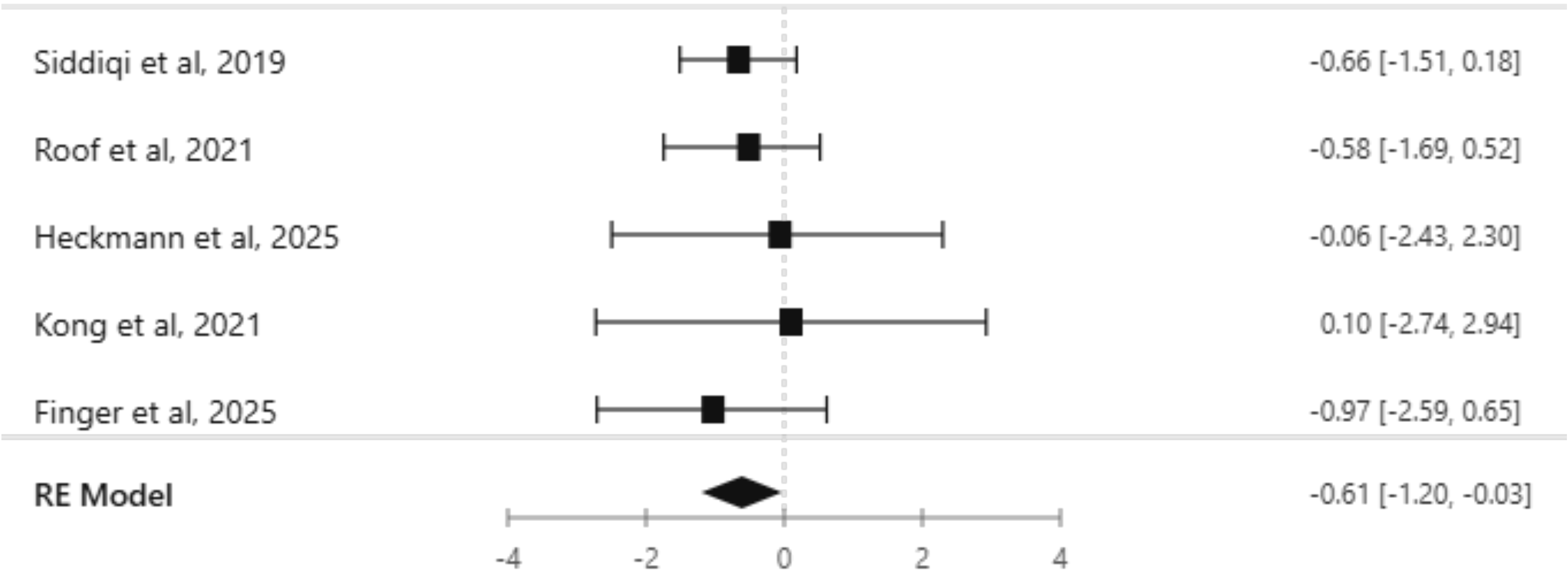
METHOD

Systematic Reviews and Meta-Analyses according to PRISMA guidelines

- Systematic search of PubMed, Web of Science, and Scopus performed up to September 2025.
- Only English-language studies reporting quantitative outcomes of **ARTICULATING SPACERS** in two-stage revision for knee **PJI** were included.
- Data on demographics, reinfection, and mechanical failure extracted and analyzed separately for **METAL-ON-POLYETHYLENE** and **ALL-CEMENT SPACERS**.
- Study quality assessed by the Newcastle–Ottawa Scale. Pooled effect estimates calculated as log odds ratios on a random-effects model.
- Heterogeneity evaluated with Q-test and , potential outliers with studentized residuals and Cook’s distance. Analyses conducted in jamovi v2.4.

RESULTS

Fifty-eight studies including 4,449 patients met inclusion criteria. Mean age ranged from 57 to 82 years, and follow-up from 3 to 90 months. Reinfection occurred in 70 of 562 patients in five studies reporting both spacer types. Meta-analysis revealed a significantly lower risk of reinfection with metal-on-polyethylene spacers compared with all-cement designs. No significant differences emerged in mechanical failure rates. Heterogeneity was minimal and no publication bias was detected.



CONCLUSIONS

Both articulating spacer types provide similar mechanical stability during two-stage knee revision, but metal-on-polyethylene designs show superior infection control without increased mechanical complications. Their smoother articulation and reduced cement debris likely limit bacterial adhesion. Despite study heterogeneity, these findings support metal-on-polyethylene spacers as a reliable option for managing chronic knee PJI. Future prospective trials should standardize definitions of mechanical and infectious failure to strengthen evidence on optimal spacer selection.

CONTACT INFORMATION

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