



# Collared vs Collarless Stems in Primary Total Hip Arthroplasty – A Systematic Review and Meta-analysis

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## INTRODUCTION

Periprosthetic femur fractures (PPF) remain a major complication following THA and are expected to increase along with the number of THAs performed. The use of a collared femoral component has been suggested as a potential method to mitigate this issue. Several studies attempted to report differences between collared and collarless uncemented stems. However, there is no consensus on which femoral implant design is preferable. Herein, we performed a systematic review and meta-analysis aiming to compare collared and collarless femoral stem implants regarding PPF, all-cause revision, and aseptic loosening.



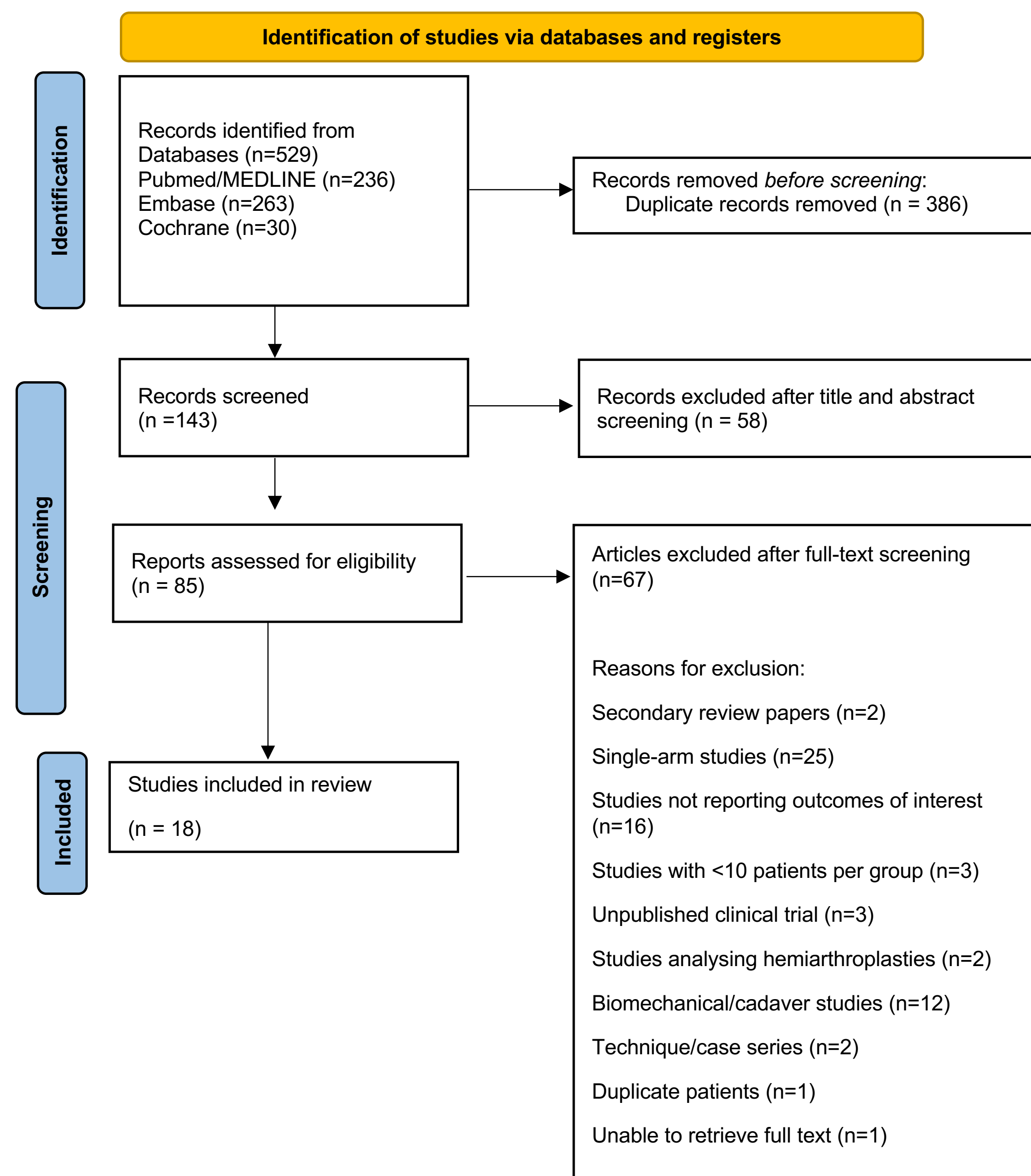
## METHODS

The PRISMA guidelines were followed. PubMed, Embase, and Cochrane databases were thoroughly searched to identify relevant studies up to December 2022.

### PRISMA 2020 flow diagram for new systematic reviews (searches of databases and registers only)

Search strategy:

(collared OR collarless) AND ("total hip" OR "hip replacement" OR "hip arthroplasty")



Inclusion criteria:

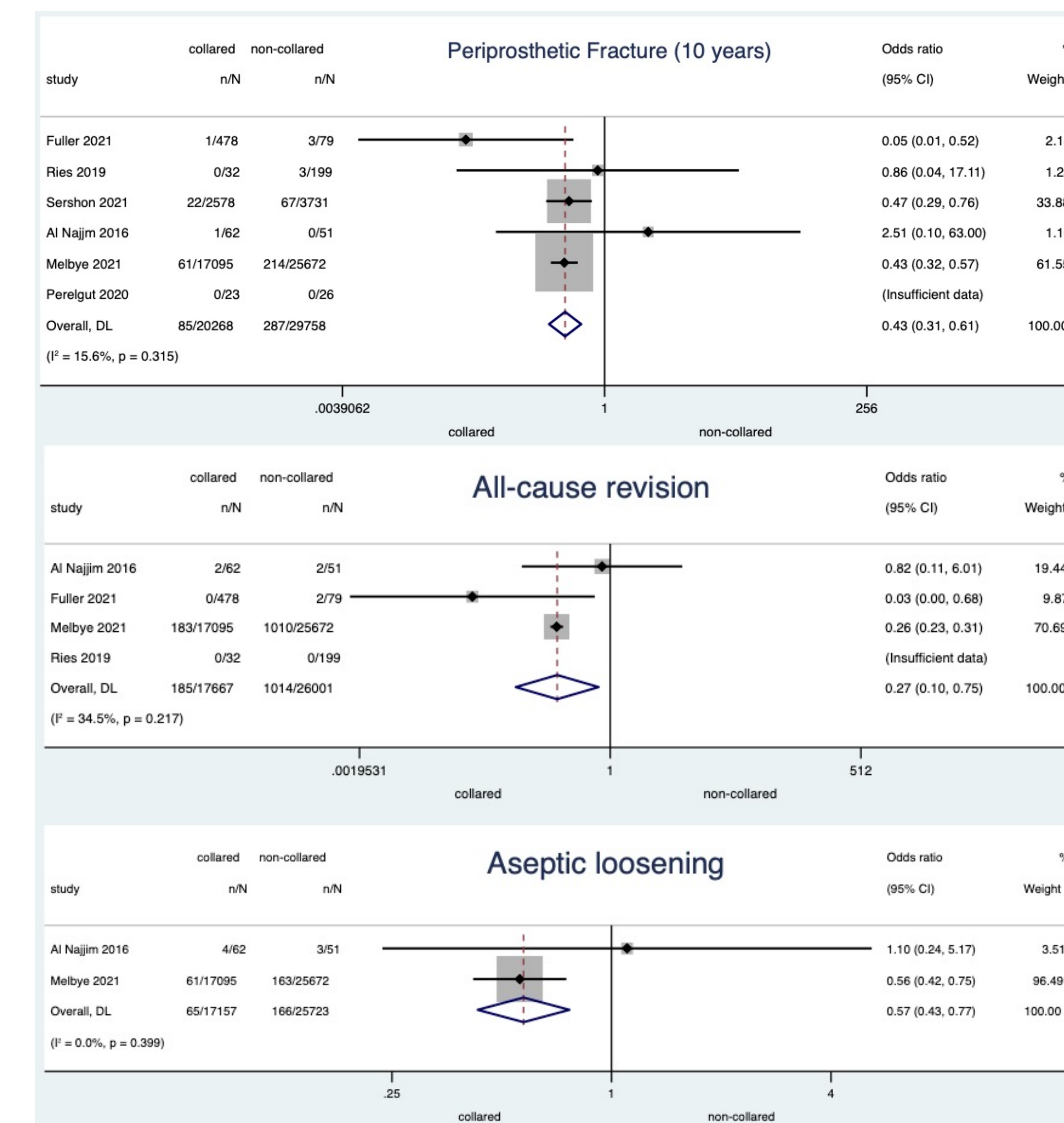
- Directly compare collared vs non-collared stems (double-arm studies)
- Report at least one of the following outcomes of interest: revision for any cause, periprosthetic fracture (intraoperative and/or postoperative), stem subsidence, or aseptic loosening
- >= 10 patients per group

## RESULTS

- 18 studies, with a total of 266,152 patients (37,567 collared; 228,585 collarless), were included in the final analysis. Follow-up ranged from 1 to 11 years, the mean age was 69.3 ± 5.9 years, and 37% (99,578/266,152) were male. - Cementless only: Nine studies, with a total of 50,346 patients (20,499 collared; 29,847 collarless), were included in the final analysis. Follow-up ranged from 6 to 132 months, the mean age was 67 ± 5 years, and 38% (18,996/50,115) were male.

- Collared stems were associated with significantly lower rates of postoperative PPF (OR: 0.43, 95% CI: 0.31-0.61, I2: 15.6%) compared to collarless stems.

- Random effects model meta-analysis also demonstrated significantly lower rates of all-cause revision surgery for the collared stems group (OR: 0.27, 95% CI: 0.10-0.75), which was also associated with significantly lower rates of aseptic loosening (OR: 0.57, 95% CI: 0.43-0.77).



## DISCUSSION

This study provides evidence that collared stems may be protective against periprosthetic femur fractures. Regarding revision and subsidence/aseptic loosening, no statistical differences were observed. Prospective randomized controlled trials should be conducted to further investigate the relationship between stem design and postoperative outcomes as the current literature is inconclusive.