

Clinical and Radiological Outcomes of Robot Assisted Patellofemoral joint replacement - a systematic review.

Introduction: Robot-assisted patellofemoral joint arthroplasty (R-PFA) has been developed to improve surgical precision. This review examines the evidence regarding its clinical outcomes, radiological results, and implant survivorship, comparing these outcomes with conventional techniques.

Methods: A systematic review was reported according to PRISMA guidelines. The Cochrane Register of Trials, PubMed, Medline, and Scopus databases were searched for studies reporting outcomes following R-PFA for patellofemoral osteoarthritis. Data on PROMs, ROM, radiographic outcomes, implant survivorship, and complications were extracted. Risk of bias was assessed using the MINORS score. Heterogeneity in outcome assessment precluded meta-analysis and narrative synthesis was therefore performed.

Results: 1,047 R-PFA procedures (9 studies) were included. R-PFA demonstrated significant improvements in OKS and VAS pain scores compared to pre-operative values (3 studies) at mean follow up times ranging from 15.9-63.6 months. When compared to conventional-PFA, R-PFA was associated with a shorter length of hospital stay (R-PFA 20.6 vs C-PFA 30.9 hours), and greater correction in patellar tilt (C-PFA -0.09 vs R-PFA 6.1). One study reported a significantly lower overall revision rate with R-PFA at a mean follow-up of 55.2 months (R-PFA 6.4% vs C-PFA 18.8%). No significant differences were found between the techniques in PROMs. Patient satisfaction with R-PFA ranged from 78.9%-94%.

Conclusions: R-PFA has demonstrated promising mid-term outcomes across the parameters analysed. Current evidence remains inconclusive regarding its superiority over conventional techniques, particularly with respect to PROMs/implant survivorship. Comparative studies are required to clarify these findings including an emphasis on cost-effectiveness.