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The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Review

Patellar Resurfacing in Total Knee Arthroplasty: Systematic Review and Meta-Analysis

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ARTICLE INFO

Article history:

Received 26 June 2017

Received in revised form

2 August 2017

Accepted 29 August 2017

Available online 6 September 2017

Level of Evidence:

Systematic review and meta-analysis (Level III)

Keywords:

patellar resurfacing
total knee arthroplasty
meta-analysis
systematic review
patellofemoral

ABSTRACT

Background: Patellar resurfacing in total knee arthroplasty remains controversial. The aim of this study is to evaluate this technique through an analysis of comparative studies in the current literature.**Methods:** We performed a comprehensive search of PubMed, MEDLINE, Cochrane, CINAHL, and EMBASE databases using various combinations of the keywords “Knee,” “Replacement,” “Prosthesis,” “Patella,” “Resurfacing,” and “Arthroplasty.” All articles relevant to the subject were retrieved, and their bibliographies were hand searched for further references relevant to primary patellar resurfacing in total knee arthroplasty. Only articles published in peer-reviewed journals were included in this systematic review. **Results:** The percentage for a reoperation was 1% for the patellar resurfacing group (17/1636) and 6.9% for the non-resurfacing group (118/1699) (odds ratio [OR] 0.18, 95% confidence interval [CI] 0.11–0.29, $P < .00001$). The patellar resurfacing group showed a significantly higher postop Knee Society Score (KSS) pain (OR 1.52, 95% CI 0.68–2.35, $P = .004$) and postop Hospital for Special Surgery score (OR 4.35, 95% CI 3.21–5.49, $P < .00001$), over the non-resurfacing group.**Conclusion:** Based on the outcome scores of KSS (pain), KSS (function), and Hospital for Special Surgery postop, patellar resurfacing TKAs have performed better than non-resurfaced TKAs. The lower secondary operation and revision rates for patellar resurfaced TKAs also demonstrate that this technique is the more effective option. However, the full impact of patellar resurfacing still needs to be critically evaluated by larger randomized controlled trials with long-term follow-up.

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Despite the excellent clinical success of total knee arthroplasty (TKA), there is no consensus in the available literature on the best management of the patella in TKA [1]. Current options include resurfacing, and non-resurfacing with or without deafferentation (electrocautery treatment) of the patella [2].

Anterior knee pain has been found in 6%–25% of the patients after primary TKA with patellar retention and there is a great heterogeneity regarding the surgical options between countries. According to different studies and registries carried out between 2014 and 2015, in North America more than 90% of surgeons resurface

the patella, 60% in Australia, 80% in Denmark, and 2% in Sweden and Norway [3]. Advocates of patellar resurfacing point out cost-effectiveness, lower number of reoperations, and less anterior knee pain [4].

Despite these benefits, patellar resurfacing entails a greater risk of patellar fracture, dislocation, implant failure, patellar tendon injury, and patellar implant failure [5–7]. Studies also show that the incidence of patellofemoral clunk in the patellar resurfaced group was significantly greater than the non-resurfaced group [8]. Proponents of patellar retention sustain that patellar resurfacing offers no advantages in functional outcomes, reoperation rate, or total healthcare cost, and it is associated with more complications [9].

On the other hand, non-resurfacing seems to be associated to a higher incidence of anterior knee pain, readmission, and further interventions, but it is also associated with more reoperations [6,10]. Therefore, these results do not explain why a large

No author associated with this paper has disclosed any potential or pertinent conflicts which may be perceived to have impending conflict with this work. For full disclosure statements refer to <http://dx.doi.org/10.1016/j.arth.2017.08.041>.

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<http://dx.doi.org/10.1016/j.arth.2017.08.041>

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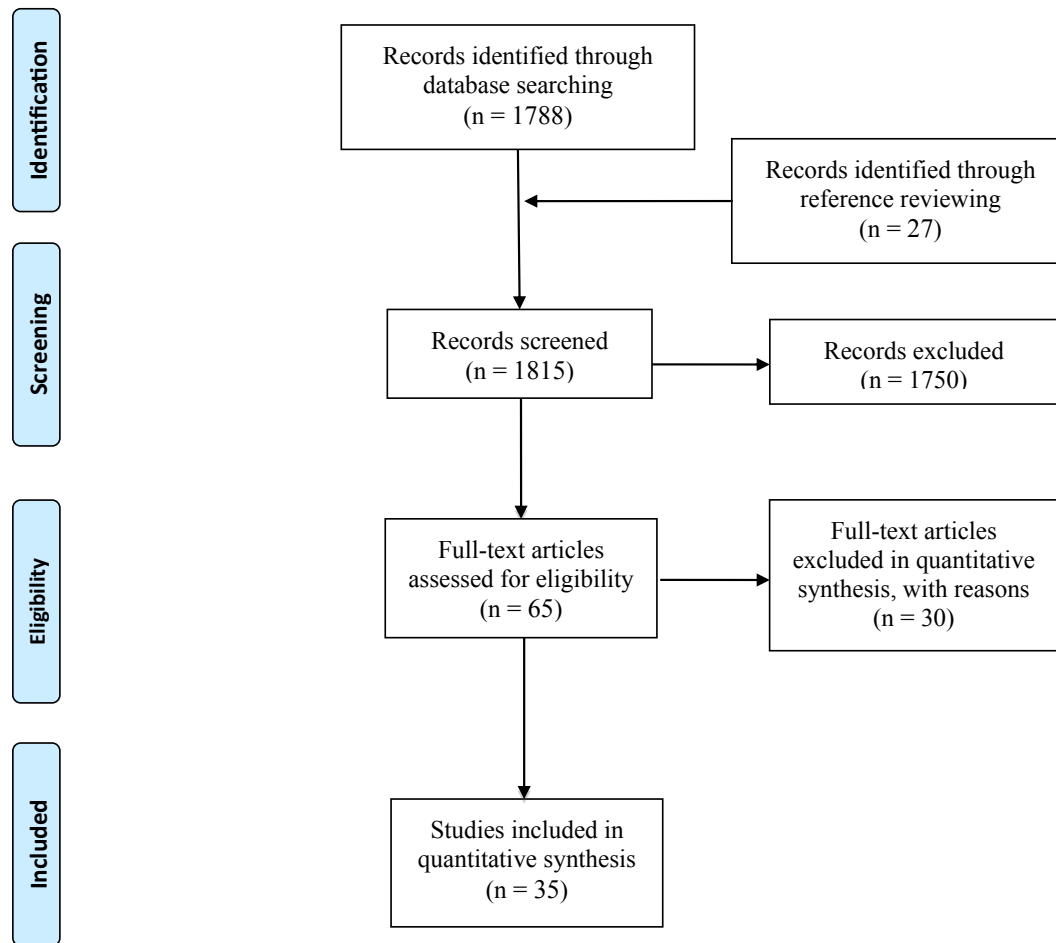


Fig. 1. PRISMA 2009 flow diagram.

proportion of TKAs in Europe, up to 95%, employ a non-resurfacing technique [11]. Randomized trials have been performed, but no definitive conclusions have been reached regarding which option is superior [12–19].

Therefore the aim of this meta-analysis is to cumulate data from a large number of randomized controlled studies on patella resurfacing to establish the advantages and disadvantages of these procedures with particular care to anterior knee pain, type of studies, follow-up, revision and reoperation rate, and knee scores (Knee Society Score [KSS] pain, function, and total/Hospital for Special Surgery [HSS]).

Materials and Methods

We performed a quantitative synthesis of all comparative studies to compare 2 technical approaches to management of the patellar: patellar resurfacing and patellar non-resurfacing in terms of revision and complications, according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines with a PRISMA checklist and algorithm [20,21]. The search algorithm according to the PRISMA guidelines is shown in Figure 1. A comprehensive search of the PubMed, MEDLINE, CINAHL, Cochrane, EMBASE, Ovid, and Google scholar databases was performed using the following combinations of the keywords: “Knee,” “Replacement,” “Prosthesis,” “Patella,” “Resurfacing,” and “Arthroplasty.” We selected articles published from inception of database to 2017. Three independent reviewers (U.G.L., M.C., and V.D.) separately conducted the search. All journals were considered, and

all relevant studies were analyzed. To qualify for the study, articles had to be published in a peer-reviewed journal. All articles were initially screened for relevance by title and abstract, excluding articles without an abstract, and obtaining the full-text article if the abstract did not allow the investigators to assess the defined inclusion and exclusion criteria. The 3 investigators (U.G.L., M.C., and V.D.) separately reviewed the abstract of each publication and then performed a close reading of all papers and extracted data, to minimize selection bias and errors. A cross-reference search of the selected articles was also performed to obtain other relevant articles for the study. All comparative articles reporting outcomes of patellar or not patellar resurfacing after TKA were taken into account. The last search was performed on March 31, 2017.

According to the Oxford Centre of EBM, Level I-IV articles were found in the literature and included in our study. Given the linguistic capabilities of the authors, articles in English, French, Dutch, Spanish, and Italian were included. Inclusion criteria were as follows: an appropriate description of the surgical procedure, an adequate follow-up period, and at least one validated outcome scores. Outcome parameters included anterior knee pain, revision rate, and clinical scores. Missing data pertinent to these parameters warranted exclusion from this systematic review.

Literature reviews; case reports; studies on animals, cadaver, or in vitro investigations; biomechanical reports; technical notes; letters to editors; and instructional courses were excluded. We excluded articles with insufficient details of surgical intervention, follow-up, age of patients, clinical examination, clinical post-operative outcomes, and statistical analysis.

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