#262

Patellofemoral Resurfacing And Circumferential Denervation In Primary Total Knee Arthroplasty: A Systematic Review And Network Meta-Analysis

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Introduction: Management of the patellofemoral components in total knee replacement (TKR) with denervation, resurfacing and non-resurfacing is still controversial in the literature.

Objectives: To conduct a systematic review and network meta-analysis of RCTs comparing relevant clinical outcomes (ie. Visual Analog Scores, Knee Society Scores , Knee Functional Scores, anterior knee pain scores and patellar complications such as re-operation, infection and fracture) between patellar denervation, patellar resurfacing and non-resurfacing.

Methods: Data Sources: We searched Medline and Scopus via PubMed and Scopus search engines from inception to October 23th, 2012.

Study Selection: Randomized clinical trials or quasi-experimental designs comparing clinical outcomes between relevant management of patellofemoral components in TKR.

Data Extraction: Two reviewers independently extracted the Visual Analog Scores (VAS), Knee Society Scores (KSS), Knee Functional Scores (KFS) and anterior knee pain scores, as well as patellar complications (re-operation, infection, fracture and other problems) between treatment groups. Unstandardized mean difference (UMD) and random-effects methods were applied for pooling continuous and dichotomous outcomes, respectively. A longitudinal mixed regression model was used for network meta-analysis to indirectly compare treatment effects.

Results: Data Synthesis: Eighteen of 315 studies identified were eligible. When compared to patellar non-resurfacing, patellar denervation demonstrated significant improvement in pain symptoms with a UMD in pain VAS and KSS of -0.687 (95% confidence interval [CI], -1.127, -0.246) and 2.552 (95% CI, 0.426, 4.678), respectively. Patellar resurfacing showed no significant improvement in VAS, KSS and KFS when compared to non-resurfacing. The relative risk of reoperation was significantly lower with patellar resurfacing as compared to non-resurfacing, with pooled RRs of 0.687 (95% CI, 0.503, 0.938). This network meta-analysis suggests a benefit in patellar denervation and patellar resurfacing, as patellar denervation results in a lower chance of anterior knee pain when compared to non-resurfacing with a pooled RR of 0.625 (95% CI, 0.381, 1.025), and patellar resurfacing demonstrates a significantly lower chance of re-operation when compared to non-resurfacing with a pooled RR of 0.677 (95% CI, 0.498, 0.921). Multiple active treatment comparisons indicated that patellar denervation resulted in a greater improvement in KFS than patella resurfacing with a UMD of 14.54 (95%CI, -0.903, 29.983).

Conclusions: Our review suggests that patellar denervation and patellar resurfacing can be selected for management of the patellofemoral component in total knee replacement. Patellar denervation may improve post-operative knee function but does not improve pain when compared to patellar resurfacing.