

RETENTION VERSUS SACRIFICE OF THE POSTERIOR CRUCIATE LIGAMENT IN TOTAL KNEE REPLACEMENT FOR TREATMENT OF OSTEOARTHRITIS AND RHEUMATOID ARTHRITIS

Jacobs Wilco, Clement Darren J, Wymenga Ate AB

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ABSTRACT

Background

The functional and clinical results to support the choice whether or not to retain the posterior cruciate ligament (PCL) during total knee arthroplasty have not been gathered and analysed so far. There are at least some trials showing no difference.

Objective

To identify the difference in functional, clinical, and radiological outcome between retention and sacrifice of the PCL in total knee arthroplasty in patients with osteoarthrosis and other non-traumatic diseases.

Criteria for considering studies for this review

A search was conducted in MEDLINE(Through PubMed; 1966 - March 2004), EMBASE (1980 - March 2004), Cochrane Central Register of Controlled Trials (CENTRAL Issue 2004 - 1), and Current Contents (1996 - March 2004). Also, references of selected articles were checked and citation tracking on the articles selected was performed.

Selection criteria

Randomised controlled trials comparing retention to sacrifice of the PCL during total knee arthroplasty with regard to functional, radiological and clinical outcome in patients with osteoarthritis and other non-traumatic diseases were selected by two independent reviewers.

Data collection and analysis

Methodological quality was assessed with the checklist by van Tulder and the Jadad list. Data was collected with a predeveloped form. Meta-analysis was performed with subgroup analyses on age, gender, disease severity, and follow-up time, if allowed by adequate power.

Main results

Eight randomised controlled trials were found. Two treatment options were compared against PCL retention: PCL sacrifice without additional stabilisation (post and cam mechanism) (2 studies), and PCL sacrifice with posterior stabilized design (5 studies). One study included all three options. Range of motion was found to be 8.1° higher in the posterior stabilized group compared to the PCL retention group ($p=0.01$, 95% confidence interval [1.7, 14.5]), although the heterogeneity was high ($I^2 = 66.3\%$). PCL resection without substituting the PCL with a posterior stabilised prosthesis showed no difference compared to PCL retention ($p=0.31$, $I^2 = 83.2\%$). On clinical scores, only Hospital for Special Surgery score revealed a significant difference of 1.6 points ($p=0.03$, 95%

confidence interval [-3.1, -0.1]) between PCL retention versus PCL sacrifice and substitution combined favouring the latter group. The necessary subgroup analyses could not be performed for the clinical scores.

Authors' conclusions

These results should be interpreted with caution as the methodological quality of the studies was highly variable. We conclude that there is, so far, no solid base for the decision to either retain or sacrifice the PCL with or without use of a posterior stabilized design during total knee arthroplasty. The technique of PCL retention is difficult because the normal configuration and tension need to be reproduced with ligament tensioners. Knowledge of the technique needs to be improved before it can yield superior results compared to the more straightforward techniques of PCL sacrifice or use of a posterior stabilized design. Also, studies evaluating the effect of both techniques should address the right outcome parameters such as range of motion, contact position, and anterior-posterior stability. Suggestions are given to improve future research on this specific topic of knee arthroplasty.
