COMPUTER ASSISTED SURGERY FOR KNEE LIGAMENT RECONSTRUCTION

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A B S T R A C T

Background

Anterior cruciate ligament (ACL) reconstruction is one of the most frequently performed orthopaedic procedures. The most common technical cause of reconstruction failure is graft malpositioning. Computer assisted surgery aims to aid graft placement.

Objective

To assess the effects of computer assisted reconstruction surgery versus conventional operating techniques for ACL or posterior cruciate ligament (PCL) deficient knees in adults.

Criteria for considering studies for this review

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (October 2010), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 3), MEDLINE (1966 to March 2010), EMBASE (1980 to March 2010), CINAHL (1937 to March 2010), article references and prospective trial registers.

Selection criteria

Randomised controlled trials (RCTs) and quasi-randomised controlled trials that compared computer assisted surgery (CAS) of the ACL and PCL with conventional operating techniques not involving CAS, were included.

Data collection and analysis

Two authors independently screened search results, assessed risk of bias and extracted data. Where appropriate, data were pooled using risk ratios or mean differences, both with 95% confidence intervals.

Main results

Four randomised controlled trials were included (266 participants). All involved ACL reconstructions performed by experienced surgeons. Risk of bias assessment was hampered by poor reporting of trial methods. Pooled data from two trials showed no statistically or clinically significant differences at two years or more follow-up in self-reported quality of life outcomes: International Knee Documentation Committee (IKDC) subjective scores (mean difference 2.05, 95% CI -2.16 to 6.25) and Lysholm scores (mean difference 2.05, 95% CI -2.16 to 6.25). A third trial also found a minimal difference in IKDC subjective scores (mean difference = 0.2). Pooled data from three trials for normal or nearly normal IKDC knee examination grades at final follow-up showed no significant differences between the two groups (risk ratio 1.01, 95% CI 0.96 to 1.06). No significant differences were found for other objective measures of knee function. The only adverse effects reported were some loss in range of motion in two versus three participants in one trial. CAS use was associated with longer operating times (range 9.3 to 26 minutes).

Authors' conclusions

A favourable effect of computer assisted surgery for cruciate ligament reconstructions of the knee compared with conventional reconstructions could neither be demonstrated nor refuted. There is insufficient evidence to advise for or against the use of CAS. There is a need for improved reporting of future studies of this technology.