A meta-analysis of amputation versus limb salvage in mangled lower limb injuries: the patient perspective

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CRD summary
This review found that lower limb reconstruction was more psychologically acceptable to patients than amputation, but the physical outcomes for the two approaches were similar. The review process was generally well conducted, but an inappropriate statistical analysis means that, although the conclusions may be correct, they cannot be considered to be reliable.

Authors' objectives
To assess quality of life after amputation compared with after limb salvage in patients with mangled lower limb injuries.

Searching
MEDLINE, EMBASE and The Cochrane library were searched up to August 2007. Some search terms were reported. Only publications in English published from 1990 onwards were eligible. References in the identified publications were checked for additional studies.

Two independent reviewers performed the search.

Study selection
Studies had to include only patients eligible for limb amputation or salvage of a single, lower limb. Quality of life had to be assessed using the Short Form 36 Health Survey (SF-36) or Sickness Impact Profile scales. Studies had to include at least 20 patients with a minimum follow-up time of two years. Studies restricted to specific age groups, racial groups or specific fracture types were excluded, as were studies of patients with previous leg or foot amputations.

Four of the included studies compared amputation with reconstruction, five were of amputation only and two of reconstruction only. Eight studies used the SF-36 scale and three (all from the same study group) used Sickness Impact Profile scales.

Study selection was performed by two independent reviewers.

Assessment of study quality
The authors assessed quality using an apparently self-defined scale, based on study reporting of inclusion criteria, drop-out rate, follow-up time and outcomes. The maximum quality score was ten points. Studies with scores below five were excluded from analyses.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Data on both the physical and psychological components of the SF-36 or Sickness Impact Profile scales was extracted. The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
The authors reported using a random-effects model to analyse odds ratios for both SF-36 and Sickness Impact Profile scales, but no results of such an analysis were presented. The authors reported the weighted mean for each outcome score across all studies, separately for the amputation and reconstruction groups. T-tests were used to identify significant differences between groups.

Results of the review
The review included 11 studies with 769 amputations and 369 limb reconstructions. Three studies were from the same
study group and only that with longest follow-up was used in analyses. The mean age was 38.9 years. Follow-up times ranged from two to 28 years (mean 12.13). Study quality scores ranged from five to ten (the maximum). Four studies had a quality score of ten.

The mean SF-36 physical component score was 39.76 (±7.06) in the amputation patients and 38.5 (±0.78) in the reconstruction patients. The mean Sickness Impact Profile scales physical score was 16.2 in amputation patients and 13.3 in reconstruction patients. There was no evidence of a significant difference between the groups.

The mean SF-36 mental component score was 52.05 (±3.39) in the amputation patients and 50.76 (±3.09) in the reconstruction patients. The mean Sickness Impact Profile scales mental score was 15.6 in amputation patients and 11.5 in reconstruction patients. These scores were significantly higher in the reconstruction group (p=0.008 for SF-36, p=0.05 for Sickness Impact Profile scales; one study).

**Authors' conclusions**
Lower limb reconstruction was more psychologically acceptable to patients than amputation, and physical outcomes for the two approaches were similar.

**CRD commentary**
The review process was generally well conducted. A suitable search was performed and attempts were made to avoid reviewer bias in the search and study selection process. Appropriate, broad inclusion criteria were used. Study quality was assessed using appropriate criteria for observational studies, and only studies of moderate or high quality included.

The authors reported that they performed a random-effects meta-analysis but no results were presented. Instead the mean outcome scores in each treatment arm were given, summarised across studies. This was not an appropriate method of summarising data across trials as it pooled patients across studies which may have very different populations and effect sizes; this may lead to biased results. For this reason, the finding that leg reconstruction was more psychologically acceptable than amputation cannot be considered to be reliable.

**Implications of the review for practice and research**
The authors did not state any implications for practice or further research.

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