Meta-analysis of infrapopliteal angioplasty for chronic critical limb ischemia
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CRD summary
The authors concluded that the technical success and subsequent durability of percutaneous transluminal angioplasty was limited compared with bypass surgery. Limb salvage was comparable between the two surgical methods. Methodological limitations of the review and a lack of studies that compared the two methods directly meant that the conclusions may not be reliable.

Authors' objectives
To assess the middle term outcomes after crural angioplasty in patients with chronic critical limb ischemia and to compare results with a meta-analysis of popliteal-to-distal vein bypass graft.

Searching
MEDLINE and EMBASE were searched from 1981 to October 2006. Search terms were provided. The reference lists of retrieved articles were checked for additional studies.

Study selection
Studies that evaluated middle term outcomes (such as immediate technical success, primary and secondary patency, limb salvage and patient survival) after infra-popliteal angioplasty in patients with chronic critical limb ischemia were included in the review. Studies had to assess a minimum of 15 crural percutaneous transluminal angioplasties. Most patients had to have ischemic rest pain or tissue loss. Inclusion criteria regarding study designs were not defined, although studies had to present survival analysis and have a minimum follow up of 12 months. Studies lacking demographic data or information on clinical variables were not excluded. Studies were excluded if they did not describe a greater number of percutaneous transluminal angioplasties when results were reported together with formocresol percutaneous transluminal angioplasties.

The mean age of the participants ranged from 64 to 81 years. Most of the included studies targeted patients with critical limb ischemia: two studies targeted diabetic participants; two targeted participants with end-stage renal disease; and two targeted poor candidates for bypass. Most of the included studies used a retrospective design.

The authors stated that three reviewers were involved in data collection and analysis; no other details were provided.

Assessment of study quality
The authors stated that quality assessment was undertaken by assigning a score up to a maximum of 21 for each study. Most criteria related to reporting of study characteristics (such as the rate of patients requiring percutaneous transluminal angioplasties and the number of patients, limbs and procedures), with the exception of loss to follow-up.

The authors stated that three reviewers were involved in data collection and analysis; no other details were provided. The scoring system was not blinded.

Data extraction
Data were extracted from life-tables, survival curves and texts. The authors stated that three reviewers were involved in data collection and analysis; no other details were provided.

Methods of synthesis
Meta-analyses examining pooled r (monthly hazard rates) and a standard error (SE) were performed using a random-effects model for each month of follow-up. Subgroup analyses were carried out on clinical characteristics (including the proportion of limbs with tissue loss, the extension of the crural percutaneous transluminal angioplasties and the use of subintimal dissection). Sensitivity analysis that omitted low quality studies and excluded studies with different clinical factors were also conducted. Publication bias was assessed visually using a funnel plot.
Results of the review
Thirty studies (n=2,557 participants, n=2,653 limbs) were included in the review.

The median quality score was 15 (range 5 to 18).

The pooled estimate of immediate technical success was 89.0 per cent (±2.2%) overall; for primary patency (14 studies) the estimate was 77.4 per cent (±4.1%) at one month and 48.6 per cent (±8.0%) at three years; for secondary patency (eight studies) the estimate was 83.3 per cent (±1.4%) at one month and 62.9 per cent (±11.0%) at three years. The pooled estimate for limb salvage (number of studies not reported) was 93.4 per cent (±2.3%) at one month and 82.4 per cent (±3.4%) at three years; survival rate was 98.3 per cent (±0.7) at one month and 68.4 per cent (±5.5%) at three years.

No publication bias was detected.

Authors' conclusions
The technical success and subsequent durability of crural angioplasty was limited compared with bypass surgery. Limb salvage was comparable between the two methods.

CRD commentary
The review addressed a clear question and was supported by appropriate inclusion criteria. The authors searched only two databases and did not state whether they searched for unpublished studies and studies published in any language. But, they included a large number of studies in their analysis and attempted to assess publication bias. Validity was assessed, although it did not appear that the criteria adequately evaluated all types of methodological biases (for example, selection, performance, attrition and detection biases). It was stated that three reviewers were involved in data collection and analysis, but details of the process were not presented in the text and so reviewer error could not be ruled out. Due to the methodological limitations of the review and a lack of evidence on bypass surgery comparisons, the conclusions may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that the choice of therapeutic method was dependent on the experience of the surgical team.

Research: The authors stated that further research was needed to assess the role of crural percutaneous transluminal angioplasties.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.