Is concomitant surgery for moderate functional mitral regurgitation indicated during aortic valve replacement for aortic stenosis? A systematic review and evidence-based recommendations

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CRD summary
This review concluded that there was inconclusive evidence on the efficacy of surgical intervention for moderate functional mitral regurgitation at the point of aortic valve replacement for aortic stenosis. Given the poor quality of the available evidence included in the review and the small numbers of patients who met review criteria, these cautious conclusions were appropriate.

Authors' objectives
To assess the evidence for surgical intervention for moderate functional mitral regurgitation at the point of aortic valve replacement for aortic stenosis.

Searching
MEDLINE, EMBASE and The Cochrane Library were searched from inception to May 2009. Abstracts from five major surgical meetings were searched for the previous five years. References of identified studies were checked.

Study selection
Studies of patients at least 18 years old who underwent isolated primary aortic valve replacement for aortic stenosis and who had moderate functional mitral regurgitation on preoperative two-dimensional echocardiography were eligible for inclusion. Moderate mitral regurgitation was assessed as the presence of at least one of several criteria adopted from American Heart Association/American College of Cardiology criteria (criteria listed in paper). If these criteria were not explicitly stated then authors' definitions were accepted provided they specified moderate functional mitral regurgitation. Within each study patients were excluded because: they underwent aortic valve replacement for aortic regurgitation, or they had balloon valvuloplasty, structural mitral valve disease or mitral regurgitation that was not moderate in degree.

Reported prevalence of moderate mitral regurgitation ranged from 7% to 97%. Some studies included patients with comorbidities that included coronary artery disease, mitral annular calcification and aortic insufficiency. Most studies were conducted in North America.

Three reviewers selected the papers for the review.

Assessment of study quality
Studies were assessed for validity using United states Preventative Services task Force (USPSTF) criteria and were graded as good, fair or poor. The authors did not state how many reviewers performed the validity assessment.

Data extraction
The number of patients with preoperative functional moderate mitral regurgitation and the number of these in whom mitral regurgitation improved remained the same or worsened postoperatively were extracted using outcome at most recent echocardiographic follow-up. Survival rates for patients with different severities of mitral regurgitation were extracted.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis. Numbers of patients with functional mitral regurgitation who experienced particular outcomes (improvement, remaining the same, worsening) were summed across studies.
Results of the review
Thirteen studies were identified (n=2,113 participants) from which 268 participants met the inclusion criteria and were included in the synthesis. All studies were single-centre retrospective cohort studies and all were considered to be poor quality. Sample sizes ranged from 27 to 848 patients and from these between five and 76 patients met review criteria. Mean follow-up with echocardiography ranged from 19 days to 3.5 years postoperatively.

Of the 268 patients with preoperative functional mitral regurgitation, 164 (61%) improved, 103 remained the same (38%) and one worsened at the most recent postoperative echocardiography follow-up. Two out of four studies reported significantly poorer survival in patients with moderate to severe mitral regurgitation compared to mild and/or none. Additional prognostic factors for survival and progression of mitral regurgitation were reported.

Authors’ conclusions
There was inconclusive evidence on the efficacy of surgical intervention for moderate functional mitral regurgitation at the point of aortic valve replacement for aortic stenosis; no clinical practice recommendations could be made.

CRD commentary
The review question and inclusion criteria were clear. The authors searched multiple databases and other sources, which reduced the chances of publication bias and omission of relevant studies. It appeared that methods designed to reduce reviewer bias and error were used in the selection of studies; it was unclear whether this was also the case in data extraction and study quality assessment. Criteria used to assess study quality were appropriate to the non-randomised studies included in the review. The quality of all the included studies was rated as poor; these were retrospective cohort studies and only a minority of patients in these studies met review criteria. Use of a narrative synthesis was appropriate.

The authors’ cautious conclusions on the lack of conclusive evidence of efficacy were appropriate.

Implications of the review for practice and research
Practice: The authors stated that they could not make any recommendations for practice.

Research: The authors stated that randomised controlled trials with appropriate power and follow-up were warranted to assess surgical intervention for moderate functional mitral regurgitation at the point of aortic valve replacement for aortic stenosis. They added that such studies should have explicit definitions of moderate functional mitral regurgitation based on American Heart Association/American College of Cardiology criteria.

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