release procedures such as commissurotomy, papillary muscle splitting, and leaflet mobilization according to the morphology of rheumatic involvement.

In cases where leaflet edges are as pliable as to allow repair but leaflet surface area is insufficient to make adequate coaptation margin even after release procedures, leaflet augmentation or extension procedures are necessary to obtain a satisfactory coaptation surface. In these cases, a similar rule is applied in determining the ring size as for those cases without leaflet extension or augmentation. For example, when posterior leaflet is augmented, the adequate ring size is generally the same size as the size that covers the anterior leaflet surface area. When the anterior leaflet is augmented, the ring size should be the same size as the size that covers the entire anterior leaflet including the augmented area. If the sizing is equivocal, we believe choosing the larger size is advisable to prevent mitral stenosis.

In our previous report, leaflet augmentation technique was not as frequently performed as in other reports [2]. This is perhaps because we had more cautious and conservative attitudes toward valve repair for patients with more severe leaflet pathology in that valve replacement was preferred in potential candidates for leaflet augmentation.

Most importantly, intraoperative trans-esophageal echocardiography should be followed after pump weaning for confirmation of valve competence with adequate coaptation margin. If not satisfactory, re-repair or conversion to replacement should be followed.

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Details in a meta-analysis comparing mitral valve repair to replacement for ischemic regurgitation

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Although meta-analyses are considered to be of great value to establish an overall effect on an investigated outcome, there are some basic 'rules' to such an analysis. Several statements have guided authors in reporting results from systematic reviews and have been increasingly cited to inform readers of the quality of the review [1]. In the March 2011 issue, however, a meta-analysis of short-term and long-term survival after mitral valve repair or replacement for ischemic regurgitation was published in which several details are missing [2].

First of all, the article did not adhere to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines [3]. These guidelines may prevent authors from missing important steps in the review and analysis process. They, for example, guide to describe the search strategy in full detail. In the current meta-analysis, this is however incomplete as the authors did not report when the search was performed and therefore the inclusion and exclusion of some published articles cannot be verified. In addition, only the MEDLINE database was searched while it is well recognized that an extended literature search of EMBase and/or the Cochran Library can identify further potentially valid studies that can be included.

The authors also did not mention the length of follow-up of the operated patients. The expression 'long-term survival' is a subjective phrase, and a hazard ratio only demonstrates an effect for the defined follow-up time. It is, therefore, important to mention these data.

In the meta-analysis section, we furthermore question the accuracy of the acquired forest plots. Fig. 2 shows an overall odds ratio (OR) of short-term mortality in the replacement group versus the repair group. There is an outlying OR of 17.241 (95% confidence intervals 2.330–127.575) in the study from Al-Radi et al. [4]. We were, however, unable to find a matching OR in this article. The reported hospital mortality was 1.5% and 21% in the repair and replacement group, respectively, which yields an OR of 21/1.5 = 14. After propensity adjustment, an OR of 8.3 was reported.

In addition, the difficulty in comparing repair versus replacement is originated by surgeon preferences, the complexity of mitral valve injury, and patient characteristics. Patients who underwent repair therefore represent a different cohort than patients with a replaced valve. Even in propensity-matched studies in which baseline variables are considered equal between groups, valve-related characteristics remain incomparable. Therefore,

significant treatment bias cannot be avoided and an overall effect of preferred repair or replacement should not be established based on a meta-analysis of retrospective studies.

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Reply to Head et al.

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We thank Dr Kappetein's group for their comments [1] regarding our manuscript [2] and we appreciate the opportunity to provide clarification. The first comment raises the concern that our article does not adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [3]. On a thorough review of the 27-point checklist, we have to admit that we have not provided the time frame in which the search for relevant articles was completed. All articles that appear in the MEDLINE database up to 12/1/2009 were searched for inclusion. We also did not provide registration information for our meta-analysis, as the registration process remains optional. Nevertheless, our study addresses all other relevant items from this extensive checklist to various degrees. The point of including other sources to identify relevant articles remains valid. However, the PRISMA guidelines do not require inclusion of other database sources such as Cochrane and Embase, as the authors of the letter seem to imply. In fact, as stated in the PRISMA document, the MEDLINE database remains one of the most comprehensive sources of healthcare information [3].

Dr Kappetein et al. note that in Fig. 2 of the manuscript, there is an outlying odds ratio (OR) of 17.241 from the Al-Radi et al. article [4]. They question how this was calculated when the reported hospital mortality was 1.5% for repair and 21% for replacement, and note that this would yield an OR of 21/1.5 = 14. Actually, what the authors of the comment have calculated is not an OR but a relative risk. The OR calculation in our manuscript was correct: 1/65 patients in the repair group and 29/137 in the replacement group died, yielding an OR of 17.18 (64 × 29/1 × 108). The slight discrepancy from the reported OR of 17.241 stems from the fact that we initially calculated the OR in the opposite direction to reflect survival for replacement compared to repair which was 0.058. Subsequently, we took the reciprocal that was rounded off for ease of presentation, since repair did show superiority compared to replacement.

Our method for evaluating log-term survival has been well described and we refer the reader to the well-written article by Parmar et al. for greater insight into understanding the calculation and application of this method for obtaining summary statistics from time-to-event studies [5]. We examined the survival curves from each of the included studies and calculated log hazard ratios (and variances) using non-overlapping 6-month time intervals. This approach allows the investigator to calculate an overall log hazard ratio for each study. All of the included studies provided follow-up of at least 5 years with the exception of the study by Hickey et al. [6].

We are in agreement and have explicitly stated in our article that a meta-analysis of retrospective studies has inherent limitations which need to be considered. Unfortunately, upon searching the literature, we only found studies of retrospective nature. Short of a prospective randomized trial, patient characteristics, surgeon preference and technical ability will continue to play a role in mitral procedure selection. In trying to provide an evidence-based meta-analysis of clinically relevant studies, we selected for inclusion only those articles that would not obviously bias treatment strategy. For example, we excluded patients with hemodynamic instability, who would be more likely to undergo replacement. Therefore, our study provides a useful source of additional information to guide decision making in patients with ischemic mitral regurgitation.