

tant "extreme" left ventricular dilation, surgical replacement of the valve is not necessarily contraindicated because the increased diastolic dimension is not in itself a marker of irreversible ventricular dysfunction. In multivariate analysis, preoperative left ventricular ejection fraction was the only significant predictor of postoperative ventricular function, and diastolic chamber dimension, as measured by M-mode echocardiography, was not predictive.

Although it has been suggested by others (2) that surgical treatment for aortic insufficiency may be recommended on the basis of preoperative chamber size without adjustment for body surface area, can the present investigators truly support the use of two-dimensional chamber diameter to predict outcome from a study of only 31 patients without acknowledging the subjects' size? It is possible that the subjects were of large enough body habitus to make the two-dimensional diameter measurement relatively less significant. The reason that the study group included only men was quite likely also related to body size. Because women in general have smaller ventricles than men, they would be unlikely to develop an end-diastolic chamber size ≥ 80 mm. In women (or for that matter, any person of small stature) "extreme" left ventricular dilation might occur at a diastolic dimension of 70 mm, for example. Ejection phase indexes are predictive of outcome and postoperative ventricular function because they are independent of body size.

It would be very interesting to look at the end-diastolic volume index as a variable in this study to see whether it has any predictive value.

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Reply

We appreciate Miller's interest in our recent article (1). He raises important points regarding the management of aortic regurgitation:

1. The rationale for including extreme left ventricular dilation as an indication for operation in patients with severe aortic regurgitation is based on the observation of occurrence of sudden death treated medically with this extreme left ventricular dilation (2,3). However, the postoperative outcome of these patients was poorly defined. As mentioned in our report, the number of patients mentioned in published reports with preoperative extreme left ventricular dilation and followed up postoperatively is very limited, and their outcome was usually described as dismal but was not formally analyzed. Our study (1) fills this gap of knowledge by demonstrating that the postoperative outcome of these patients with extreme left ventricular dilation is acceptable, although mild excess late mortality is observed due to associated left ventricular dysfunction.

Indeed "only" 31 patients had extreme left ventricular dilation based on an end-diastolic diameter ≥ 80 mm. However, this degree of left ventricular enlargement is unusual, and the present series is, to our

knowledge, the largest published. We concur that patients with this degree of left ventricular dilation deserve operation without delay.

2. A very important issue is the problem of the potential bias introduced by using left ventricular diameters unadjusted for body size. We certainly agree that using unadjusted diameters is a problem, particularly for women. We have presented in abstract form (4) a study that is in the process of publication regarding aortic regurgitation in women. Briefly, it shows, as Miller may have suspected, that utilization of unadjusted left ventricular diameters as surgical criteria, either 55 mm at end-systole or 80 mm at end-diastole, is irrelevant in women with aortic regurgitation because they almost never reach this extent of ventricular dilation. This has important consequences for the outcome of women with aortic regurgitation.

3. End-diastolic volume index was not measured, but diameters normalized to body surface area have no better prognostic value than nonnormalized diameters. Therefore, we cannot specifically recommend using the body surface area-adjusted left ventricular diameters for the timing of operation. The ejection phase indexes are predictive of the outcome, not only because they are dimensionless, but mostly because they reflect the reduced myocardial contractility.

4. We think that the good outcome after operation observed in patients operated on early in the course of their disease, as demonstrated in our study (1), should lead to the reassessment of the optimal timing of operation in patients with severe aortic regurgitation. In particular, in light of the poor survival of the patients operated on with New York Heart Association class III or IV symptoms (5), even mild dyspnea or angina should lead to the consideration of operation.

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Measurement of QT Interval

In the January issue of the Journal, Molnar et al. (1) reported exceptionally long QT intervals in their article on the diurnal variation of the correct QT interval (QTc). They measured the QT interval manually from QRS-T wave templates representing 5-min averages obtained from 24-h Holter recordings. However, they do not discuss the reasons why their QT intervals are radically longer than those usually reported. For example, in the Framingham study data (2), which Molnar et al. use in heart rate correction, the measured QT intervals are ~50 ms shorter at respective heart rates. Figure 1 shows the average measured QT intervals at different heart rates in the