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## Research Letter

### Is left ventricular dimension an accurate and sufficient criteria for timing of severe aortic regurgitation surgery?



Aortic regurgitation either acute or chronic is a common form of valvular heart disease and may be developed in settings such as bicuspid aortic valve, degenerative aortic valve, structural changes in elderly patients, involvement of aortic root, rheumatic heart disease or combination of these etiologies.<sup>1</sup>

Chronicity and severity of aortic regurgitation with chronic volume overload leads to left ventricular dilation, eccentric pattern of hypertrophy and increase in left ventricular mass to permit the ventricle to eject a large stroke volume.<sup>2</sup>

The timing of surgery for valvular disease is a combination of the art and science because the patient should be scheduled early enough for surgery to prevent irreversible left ventricular damage and late enough to benefit from prosthesis in systemic circulation.<sup>3</sup>

Criteria for surgery in aortic regurgitation based on the last guideline according to left ventricular dimensions are:

Severe chronic aortic regurgitation with normal left ventricular ejection fraction (>50%) but severe left ventricular dilation as defined by left ventricle end systolic diameter >50 mm (class II a level of evidence B)

Asymptomatic severe chronic aortic regurgitation with normal ejection fraction (>50%) but severe LV dilation based on left ventricular end diastolic diameter >65 mm (class II b, level of evidence C).<sup>4</sup>

Decision making for surgical intervention based on internal diameters alone may not be sufficient in all patients because of inherent inter-observer and intra-observer variability of these measurements; also, beside this limitation, left ventricular short axis diameters fail to adequately reflect the great individual variations in 3-dimensional geometry of volume loaded ventricle.<sup>5</sup>

In the setting of chronic aortic regurgitation, left ventricle may be enlarged so much that the term “bovine” is used to show dramatic left ventricular enlargement. In this regard, we had some patients with isolated severe aortic regurgitation in the setting of rheumatic heart disease and root dilatation, that the sizes of left ventricle in 2 dimensional short axis view may not accurately show insomuch enlargement because significant left ventricular enlargement may be present in long axis vector which is not evaluated in guideline derived approach; so, Detain et al.

demonstrated that volumetric measures are superior to left ventricular dimensions in identifying patients who are at high risk of heart failure in aortic regurgitation, these findings illustrate the potential for more advanced measures to provide better discrimination than the standard measures currently in routine use.<sup>6</sup>

So we emphasis on left ventricular volume and suggest that rather than relying on one dimensional left ventricular size, though there is a great need for standardized criteria for left ventricular geometry and volume by advanced echocardiography which corrects for shape distortion and less geometrical assumption compared with linear dimensions.

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