

the high incidence of AF after cardiac surgery in general and after CABG surgery in particular remain unclear. What is certain is that its incidence far exceeds its reported prevalence in the general population and in patients with atherosclerotic CAD (Creswell, et al 1993). Similarly, it is significantly higher than the reported incidence of AF after major non cardiac surgery regardless of CAD status (Goldman, et al 1978). It seems, therefore, that there are inherent, yet undetermined mechanisms that predispose a large proportion of CABG patients to develop AF. Some of these responsible mechanisms include the use of cardiopulmonary bypass, inadequate atrial protection, and over manipulation of the right atrium.

A more plausible explanation would probably be the preexistence of electrophysiological abnormalities that are amplified during surgery and, when subjected to an adverse trigger (s) postoperatively, could be manifested as AF (Cox, et al 1993). Unfortunately, preoperative and intra-operative electrophysiological identification of these patients is highly complex, time consuming, and expensive. Consequently, identification of other convenient predictors for the development of AF remains the most practical approach

Targeting patients at risk of postoperative AF with intensive prophylactic measures may drastically reduce the morbidity, the length of hospital stay and the associated high cost.

Left atrial enlargement is among the strongest predictors for subsequent development of atrial fibrillation (Vaziri, et al 1994).

The LA can be visualized from multiple echocardiographic views from which several potential LA dimensions can be measured. However, the large volume of prior clinical and research work used M-mode or 2D anteroposterior (AP) linear dimension obtained from the parasternal long-axis view, making this the standard for linear LA measurement (Benjamin, et al 1995); The convention for M mode measurement is to measure from the leading edge of the posterior aortic wall to the leading edge of the

posterior LA wall. However, to avoid the variable extent of space between the LA and aortic root, the trailing edge of the posterior aortic wall is recommended.

Although these linear measurements have been shown to correlate with angiographic measurements and have been widely used in clinical practice and research, they inaccurately represent true LA size (Schabelman, et al 1981). Evaluation of the LA in the AP dimension assumes that a consistent relationship is maintained between the AP dimension and all other LA dimensions as the atrium enlarges, which is often not the case (Loperfido, et al 1983). Expansion of the LA in the AP dimension may be constrained by the thoracic cavity between the sternum and the spine. Predominant enlargement in the superior-inferior and medial-lateral dimensions will alter LA geometry such that the AP dimension may not be representative of LA size. For these reasons, AP linear dimensions of the LA as the sole measure of LA size may be misleading and should be accompanied by LA volume determination in both clinical practice and research.

When LA size is measured in clinical practice, volume determinations are preferred over linear dimensions because they allow accurate assessment of the asymmetric remodeling of the LA chamber (Lester SJ, et al 1999). In addition, the strength of the relationship between cardiovascular diseases is stronger for LA volume than for LA linear dimensions (Pritchett AM, et al 2003). Echocardiographic measurements of LA volume have been compared with cinecomputed tomography, biplane contrast ventriculography, and MRI (Kircher, et al 1991).

The simplest method for estimating LA volume is the cube formula, which assumes that the LA volume is that of a sphere with a diameter equal to the LA AP dimension. However, this method has proven to be inferior to other volume techniques (Khankirawatana, et al 2004). LA volumes are best calculated using either an ellipsoid model or Simpson's rule (Rodevan, et al 1999). So, left atrial volume is more reliable index of left atrial enlargement and has been shown to predict atrial