CHAPTER 02 FIBROUS MITRAL ANNULUS

A fibrous collagen wedge, pointing toward the left ventricle, separates the mitral valve and left atrium from the aortic valve. The portion of this wedge between the mitral and aortic valves is known as the aortic mitral curtain or the intervalvular fibrous curtain. The fibrous mitral annulus (Figure 2.1), at the point of this wedge, serves as the hinge for the anterior mitral leaflet. In our studies, seven markers are spaced along this hinge (Figure 2.2), from the left fibrous trigone (LFT, Marker #29), through Markers #15 and #30, to the annular “saddlehorn” (SH, Marker #22), then on through Markers #23 and #21, to the right fibrous trigone (RFT, Marker #24).

The length of the fibrous mitral annulus for the six hearts (Figure 2.3), obtained by summing the length of segments D2915, D1530, D3022, D2223, D2321, and D2124, ranged from 28 to 39 mm and this length varied from 6 to 10% during the cardiac cycle. Fibrous mitral annular length was minimum during diastole, rose steadily during ejection, then fell abruptly immediately after mitral valve opening, in concert with LV contraction, not LV pressure.

The fibrous mitral annular angle for the six hearts (Figure 2.3), defined from the LFT (Marker #29) to the SH (Marker #22) to the RFT (Marker #24), i.e., \( \theta_{29-22-24} \), ranged from 116 to 145°, and varied from 7 to...
11% during the cardiac cycle. The fibrous mitral annular angle was maximum at end diastole, fell abruptly as LVP increased during IVC, continued to fall (but more slowly) during ejection, then increased in a manner similar to LV filling during and after IVR.

Figure 2.3 LFT-SH-RFT Fibrous mitral annular length and angle for hearts H1-H6.