CHAPTER 38 THE COMMISSURES

The anterior commissure is the junctional region between the anterior leaflet and the P1 scallop of the posterior leaflet (Markers 1, 2, 3, and 16 in Figure 38.1; fold 3 in Figure 27.1). Figures 38.2 and 38.3 show individual frames from an animation of anterior commissure data during a representative heartbeat in COM07R04 with the valve closed, and open, respectively.

The posterior commissure is the junctional region between the anterior leaflet and the P3 scallop of the posterior leaflet (Markers 12, 13, 14, and 20 in Figure 38.1; fold 4 in Figure 27.1). Figures 38.4 and 38.5 show individual frames from an animation of posterior commissure data during the same heartbeat in COM07R04 with the valve closed, and open, respectively.

The commissure membranes allow the anterior leaflet and the P1 posterior scallop, as well as the anterior leaflet and the P3 posterior scallop, to swing freely around nearly orthogonal hinge axes in response to the very small internal LV pressure gradients when the valve is open, yet fold to form precise, rigid, tight seals between the anterior leaflet and the P1 posterior scallop and the anterior leaflet and the P3 posterior scallop as the rising LVP compresses each fold at the instant of valve closure and thereafter throughout systole.

Chapters 24, 25, and 26 provide additional illustrations of posterior leaflet folding at the P1/P2 and P2/P3 posterior leaflet junctions during this heartbeat. Appendix E provides the full animations of all dynamics throughout this heartbeat.
Figure 38.2 COM07R04 anterior commissure closed valve. Three views at Frame 53 identified on LVP (blue) and D78 (green) curves in lower left panel. Marker numbers in upper left panel refer to markers identified in Figure 38.1. Anterior leaflet blue. Anterior (P1) leaflet red. See animation in Appendix E.
Figure 38.3 COM07R04 anterior commissure open valve. Three views at Frame 35 identified on LVP (blue) and D78 (green) curves in lower left panel. Markers identified in Figures 38.1 and 38.2. Anterior leaflet blue. Posterior (P1) leaflet red. See animation in Appendix E.
Figure 38.4 COM07R04 posterior commissure closed valve. Three views at Frame 53 identified on LVP (blue) and D78 (green) curves in lower left panel. Marker numbers in upper left panel refer to markers identified in Figure 38.1. Anterior leaflet cyan and blue. Posterior P3 leaflet red. See animation in Appendix E.
Figure 38.5 COM07R04 posterior commissure open valve. Three views at Frame 35 identified on LVP (blue) and D78 (green) curves in lower left panel. Markers identified in Figures 38.1 and 38.4. Anterior leaflet cyan and blue. Posterior (P3) leaflet red. See animation in Appendix E.