SUPPLEMENTAL MATERIAL

Video I. 3D computational modeling in bi-caval anastomosis (corresponding to Figure 5C in the manuscript). Epicardial voltage propagation map of recipient and donor atrial chambers in right anterior oblique (left panel) and left anterior oblique (right panel) projections. The first beat is a sinus beat originating from high lateral right donor atrium. Note the atrio-atrial connection (AAC) located in the superior left atrium. During sinus rhythm there is donor-to-recipient AAC conduction with late activation of the left atrium. An organized focal right superior pulmonary vein tachycardia (CL= 300 ms) initiates and persists during the residual clip. The site of earliest activation is the right superior pulmonary vein, then sequential activation of the recipient left atrium. Note that there is now recipient-to-donor conduction via the AAC located in the superior left atrium with late activation of the donor atrial chambers.

Video II. 3D computational modeling in bi-caval anastomosis (corresponding to Figure 5D in the manuscript). Epicardial voltage propagation map of recipient and donor atrial chambers in right anterior oblique (left panel) and left anterior oblique (right panel) projections. The first beat is a sinus beat originating from high lateral right donor atrium. Note the atrio-atrial connection (AAC) located in the superior left atrium. During sinus rhythm there is donor-to-recipient AAC conduction with late activation of the left atrium. An organized focal right superior pulmonary vein tachycardia (CL= 250 ms) initiates and persists for 5 cycles. There is 2:1 recipient-to-donor conduction via the superior left atrial AAC. Then the tachycardia degenerates into atrial fibrillation sustained by re-entry in the posterior wall of the recipient left atrium with a more irregular recipient-to-donor conduction pattern.

Video III. 3D computational modeling in bi-atrial anastomosis (corresponding to Figure 6C in the manuscript). Epicardial voltage propagation map of right and left recipient and donor atrial chambers in right anterior oblique (left panel) and left anterior oblique (right panel) projections. The first beat is a sinus beat originating from high lateral right donor atrium close to the atrio-atrial connection (AAC) located in the high lateral right atrium. During sinus rhythm there is donor-to-recipient AAC conduction with late activation of the left atrium. An organized focal right superior pulmonary vein tachycardia (CL= 300 ms) initiates and persists during the residual clip. The site of earliest activation is the right superior pulmonary vein, then sequential activation of the recipient left atrium, recipient right atrium. Note that there is now 1:1 recipient-to-donor AAC conduction with late activation of the donor atrial chambers.

Video IV. 3D computational modeling in bi-atrial anastomosis (corresponding to Figure 6D in the manuscript). Epicardial voltage propagation map of right and left recipient and donor atrial chambers in right anterior oblique (left panel) and left anterior oblique (right panel) projections. The first beat is a sinus beat originating from high lateral right donor atrium close to the atrio-atrial connection (AAC) located in the high lateral right atrium. During sinus rhythm there is donor-to-recipient AAC conduction with late activation of the left atrium. A rapid focal right superior pulmonary vein tachycardia (CL= 125 ms) initiates and persists during the residual clip. The site of earliest activation is the right

superior pulmonary vein. The tachycardia quickly degenerates into atrial fibrillation sustained by re-entry in the posterior wall of the recipient left atrium with a more irregular recipient-to-donor conduction pattern via the right sided AAC located in the high lateral right atrium. As a result the donor atrial chambers are activated late and irregularly.