### Impact of ischemic and valvular heart disease on atrial excitation: a high-resolution epicardial mapping study
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**Aims:** The influence of underlying heart disease or presence of atrial fibrillation (AF) on atrial excitation during sinus rhythm (SR) is unknown. We investigated atrial activation patterns and total activation times of the entire atrial epicardial surface during SR in patients with ischemic and/or valvular heart disease (IHD) and/or AF.

**Methods:** Intra-operative epicardial mapping (N=128-192 electrodes, inter-electrode distances: 2mm) of the right atrium (RA), Bachmann’s bundle (BB), left atrium short-term groove (LAVG) and pulmonary vein area (PVA) was performed during SR in 253 patients (186 male, 47%, age 66±11 years) with IHD (N=132, 52%) or AF (N=121, 48%).

**Results:** As expected, SR origin was located in the RA superior intercavitary region in 232 patients (92%). BB activation occurred via one wavefront from right-to-left (N=163, 64%), from the central part (N=18, 7%) or via multiple wavefronts (N=72, 28%). LAVG activation occurred via 1) BB: N=108, 43%, 2) PVA: N=9, 3% or 3) BB and PVA: N=136, 54%; depending on which route had the shortest interatrial conduction time (p<0.001). BB activation via an epicardial mapping study confirmed the highest (N=132, 52%) or AF (N=121, 48%).

**Conclusion:** Atrial excitation during SR is affected by underlying heart disease and AF, resulting in structural and electrophysiological variations, as demonstrated in this study, is essential to further unravel the pathogenesis of AF.

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### Assessment of left atrial reduction for short term and long term rhythm conversion of AF in patients with rheumatic mitral valve disease
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**Background:** The pathogenesis of atrial fibrillation (AF) due to rheumatic valvular disease remains obscure. Mitrail stenosis (MS) and mitral regurgitation (MR) caused atrial fibrosis because of rheumatic process, resulting in structural and electrical remodeling of left atrium which contribute for occurrence of AF. Although Maze III procedure cures AF in majority, some resources limitation made this procedure could not be implemented in developing countries. We tested the hypothesis that left atrial reduction during mitral valve surgery may have an effect of rhythm conversion of AF in patients with rheumatic mitral valve disease.

**Objective:** Assessing the effect of left atrial reduction for short term and long term rhythm conversion of AF in rheumatic mitral valve disease.

**Method:** We conducted a retrospective cohort study in atrial fibrillation patients with rheumatic mitral valve disease who underwent mitral valve surgery during the period of May 2012 until May 2016 in the National Cardiovascular Center Harapan Kita.

**Result:** There were 257 subjects in this study, consisting of 131 subjects in the left atrial reduction group and 126 subjects in the non left atrial reduction group. In left atrial reduction group, there were 42 subjects (32.1%) with sinus rhythm in short term observation and 37 subjects (28.2%) with sinus rhythm during long term observation. From multivariate analysis, the significant variable for the short term rhythm conversion were left atrial reduction with OR 1.80 (CI 95% 1.01 – 3.20), p=0.047. While the significant variable for rhythm conversion in long term were left atrial reduction with OR 1.97 (CI 95% 1.96 – 3.64), p=0.001, beta blocker therapy with OR 1.90 (CI 95% 1.02 – 3.56), p=0.042, and pre-operation left atrial volume index <146 ml/m2 with OR 2.12 (CI 95% 1.15 – 3.92), p=0.017.

**Conclusion:** Substrate modification by left atrial reduction has significant benefit for short term and long term rhythm conversion of AF in rheumatic mitral valve disease.