

UNRAVELING ARRHYTHMOGENESIS *in* CARDIAC SURGERY

1. Coexistence of various tachyarrhythmias is a severe problem in patients with Tetralogy of Fallot and is associated with decreased survival. (*this thesis*)
2. Valvular heart disease affects interatrial conduction by slowing of conduction along Bachmann's bundle, giving rise to the predominance of alternative pathways via the oval fossa and the coronary sinus. (*this thesis*)
3. During sinus rhythm, endo-epicardial asynchrony with epicardial breakthrough waves is present and is particularly enforced by ischemic heart disease. (*this thesis*)
4. The current clinical classification of atrial fibrillation does not correlate with extensiveness of electropathology. (*this thesis*)
5. A high variety of activation patterns with multiple entering highly dissociated wavefronts is present at the pulmonary vein area, resulting in increased arrhythmogenesis. (*this thesis*)
6. Valve-sparing correction of Tetralogy of Fallot is associated with a lower incidence and gradation of postoperative pulmonary regurgitation and ventricular dilation. (*Hickey et al., 2018*)
7. Arrhythmia surgery in patients with congenital heart disease remains a surgical and electrophysiological challenge with only limited success. (*Uemura H., 2016*)
8. Epicardial breakthrough waves during atrial fibrillation result from endo-epicardial asynchrony due to advanced structural remodeling and are key factors in the maintenance of atrial fibrillation. (*de Groot et al., 2016*)
9. Chronic ischemia plays a major role in electrophysiological remodeling and atrial arrhythmogenesis in humans, which may be underestimated in clinical practice. (*Nishida et al., 2011*)
10. Upregulation of heat shock proteins attenuates atrial remodeling associated with substrate formation in atrial fibrillation, making them promising targets for individualized therapy. (*Lanters et al., 2015*)
11. The ever expanding and aging population will result in a worldwide ongoing epidemic of atrial fibrillation affecting people, healthcare facilities and societies, which cannot be halted unless its exact mechanism is unraveled, thereby paving the way to curative treatment options and preventive measures.

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