Value of Early Identification and Treatment of PV-reconnections and Its Impact in Success Rate of Ablation of Paroxysmal Atrial Fibrillation

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by

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LIST OF ABBREVIATIONS

- **AADs:** antiarrhythmic drugs
- **ACCF:** American College of Cardiology Foundation
- **ACE:** Angiotensin converting enzyme
- **ACL:** active current localization
- **ACT:** activated clotting time.
- **AF:** atrial fibrillation
- **AHA:** American Heart Association
- **ANP:** atrial natriuretic peptide
- **aPTT:** activated partial thromboplastin time
- **ARBs:** Angiotensin Receptor Blockers
- **ASA:** Acetylsalicylic acid
- **AT:** atrial tachycardia
- **AV:** atrio-ventricular
- **bid:** twice daily
- **BNP:** B-type natriuretic peptide
- **bpm:** beat per minute
- **CAD:** coronary artery disease
- **CCS:** Canadian Cardiovascular Society
- **CFAE:** complex fractionated atrial electrogram
- **CGCI:** Catheter Guidance, Control and Imaging system
- **CHF:** congestive heart failure
- **CKD:** chronic kidney disease
- **Clcr:** creatinine clearance
- **CNS:** central nervous system
- **COPD:** chronic obstructive pulmonary disease
- **CPAP:** Continuous positive airway pressure
- **CPVI:** circumferential pulmonary vein isolation
- **CRIC:** Chronic Renal Insufficiency Cohort

- **CRP:** C-reactive protein
- **CRT:** cardiac resynchronization therapy
- **CS:** coronary sinus
- **CSI:** cumulative stenosis index
- **CT:** computed tomography
- **CYP:** cytochrome P450
- **DC:** Direct currrent
- **DTI:** direct thrombin inhibitor
- **EAM:** electro-anatomical mapping
- **ECAS:** European Cardiac Arrhythmia Society
- **ECG:** electrocardiogram
- **EF:** ejection fraction
- **eGFR:** estimated GFR
- **EGM:** electrogram
- **EHRA:** European Heart Rhythm Association
- **EP:** electrophysiology
- **ERAT:** early recurrences of atrial tachyarrhythmias
- **ERP:** effective refractory period
- **ESC:** European Society Of Cardiology
- **FAM:** Fast Anatomical Mapping
- **FDA:** Food and Drug Agency
- **FEV:** forced expiratory volume in one second
- **Fr:** french
- **FRP:** functional refractory period
- **GP:** ganglionated plexi.
- **GUSTO:** Global Use of Strategies to Open Occluded Coronary Arteries
- **GWAS:** genome-wide association studies
- **HRS:** Heart Rhythm Society
- **ICE:** Intracardiac echocardiography
- **IHD:** ischemic heart disease
- **INR:** International Normalized Ratio

- **IV:** intravenous
- **LA:** left atrium
- **LAA:** Left atrial appendage
- **LAO:** left anterior oblique view.
- **LIPV:** left inferior pulmonary vein
- **LMWH:** low molecular weight heparin
- **LSPV:** left superior pulmonary vein.
- **LV:** left ventricle
- **mAmp:** milli-Ampere
- **mHz:** mega-Hertz
- **MMPs:** matrix metalloproteinases
- **MRA:** magnetic resonance angiography
- **MRI:** magnetic resonance imaging
- **MSCT:** Multi-slice Computed Tomography
- **msec:** millisecond
- **MV:** mitral valve
- **NSR:** normal sinus rhythm.
- **NT-proBNP:** N-terminal pro-B-type natriuretic peptide
- **NYHA:** New York Heart Association
- **OR:** odds ratio
- **PAI:** Plasminogen activator inhibitor-1
- **PFO:** patent foramen ovale
- **PT :** prothrombin time
- **PV:** pulmonary vein
- **PVAC:** Pulmonary Vein Ablation Catheter
- **PVI:** pulmonary vein isolation
- **PVP:** pulmonary vein potentials
- **RAAS:** Renin-Angiotensin- Aldosterone system
- **RFA:** radiofrequency ablation
- **RHD:** rheumatic heart disease
- **RIPV:** right inferior pulmonary vein

- **RSPV:** right superior pulmonary vein
- **SD:** standard deviation
- **SEC:** spontaneous echo contrast
- **SVC:** superior vena cava.
- **SVT:** supraventricular tachycardia
- **T3:** tri-iodothyronine
- **TEE:** trans-esophageal echocardiography
- **TGF-β1:** Transforming Growth Factor-β1
- **TIA:** transient ischemic attacks
- **TIMI:** Thrombolysis in Myocardial Infarction
- **TIMPs:** tissue inhibitor of metalloproteinases
- **TNF:** tumor necrosis factor
- **tPA:** tissue plasminogen activator
- **TSH:** Thyroid-stimulating hormone
- **TTE:** trans-thoracic echocardiography
- **VKA:** Vitamin K antagonist

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INTRODUCTION

Atrial fibrillation is a common supraventricular tachyarrhythmia characterized by uncontrolled atrial activation with consequent deterioration of atrial mechanical function. It is the most common sustained cardiac rhythm disturbance, increasing in prevalence with age. [1]

It is clear that the pathogenesis of atrial fibrillation is often multifaceted and the arrhythmia may develop in different pathologic conditions as well as in the normal heart. It is well recognized that increased atrial mass, decreased conduction velocity, and decreased atrial refractoriness with increased dispersion are all pro-fibrillatory factors. [2]

It has been well established that pulmonary vein (PV) triggering or driving is the dominant mechanism for paroxysmal atrial fibrillation (AF) [3], and circumferential PV isolation (CPVI) is the main approach for AF elimination. [4]

Considerable evidence points to the importance of pulmonary vein (PV) electrical isolation in the treatment of atrial fibrillation (AF) with catheter ablation procedures. [5]

However, the recurrence rate of the procedure has been reported up to 30% after initial ablation, and PV conduction recovery accounts for 80% of AF recurrence, according to remapping results during a second procedure. [6]

Although it is well recognized that recovery of pulmonary vein (PV) conduction is common among patients who fail atrial fibrillation (AF) ablation, little is known about the precise time course of recurrence. [7]

Re-isolation of recovered PV conduction can improve the success rate, making this of great importance to reduce the prevalence of PV re-connection after the initial procedure. [8]