



Surgical Ablation for Atrial Fibrillation Techniques and Outcomes

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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Dedication

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List of Abbreviations

Abb.	Full term
AADs.....	Antiarrhythmic drugs
ABCs.....	Airway, breathing, and circulation
ACC.....	American College of Cardiology
AF	Atrial fibrillation
AFFIRM.....	Atrial Fibrillation Follow-up Investigation of Rhythm Management
AHA	American Heart Association
AP.....	Action potentials
APD.....	AP duration
ARIC	Atherosclerosis Risk in Communities
AV	Atrioventricular
BNP	B-type natriuretic peptide
cAF.....	Chronic AF
cAMP	Cyclic adenosine monophosphate
CBC.....	Complete blood count
CHF.....	Congestive heart failure
COR	Classification of Recommendation
CV	Conduction velocity
DAD	Delayed after depolarization
DADs.....	Delayed afterdepolarizations
DC	Direct current
ECG	Electrocardiogram
ER	Extended release
HVA	High voltage-activated
IKATP	ATP sensitive potassium current
INCX	
INR	International normalized ratio
IV	Intravenous

List of Abbreviations Cont...

Abb.	Full term
IVC.....	Inferior vena cava
LA	Left atrium
LOE.....	Level of Evidence
LOM.....	Ligament of Marshall
LVA.....	Low voltage-activated
LVH	Left ventricular hypertrophy
N/A.....	Not applicable
<i>NaV</i>	<i>Voltage-gated Na⁺</i>
NOS	Nitric oxide synthase
PVI.....	Pulmonary veins
PVs.....	Pulmonary veins
QD.....	Once daily
QID	4 times a day
RF	Radiofrequency
RFCA	Radiofrequency catheter ablation
RP	Refractory period
RVR.....	Rapid ventricular response
RVR.....	Rapid ventricular response
RyRs.....	ryanodine receptors
SA.....	Sinoatrial
SR.....	Sinus rhythm
TAT.....	Thrombin/antithrombin complex
TF.....	Tissue factor
TFPI.....	Tissue factor pathway inhibitor
TGF- β 1.....	Transforming growth factor- β 1
TID.....	3 times a day
TM.....	Thrombomodulin
TNF α	Tumor necrosis factor- α

List of Abbreviations Cont...

Abb.	Full term
tPA-Ag	Tissue-type plasminogen activator-antigen
tPA-PAI	Tissue-type plasminogen activator/plasminogen activator inhibitor
TTE	Transthoracic echocardiography
TTX	Toxin tetrodotoxin
VEGF	Vascular endothelial growth factor
WL	Wavelength

BT

INTRODUCTION

Atrial fibrillation is a supraventricular arrhythmia. It is defined as rapid, uncoordinated atrial activity with a rapid, irregular ventricular response (*Rosenthal et al., 2010*).

Atrial fibrillation is the most common arrhythmia. It is a significant cause of morbidity such as stroke, thromboembolisms, and heart failure.

Far from benign, AF can lead to stroke, tachycardia-induced cardiomyopathy, and congestive heart failure. AF accounts for about 15% of all strokes that occur each year in the United States (*Hylek et al., 2001*).

There are medical conditions that are clearly the cause of some cases of atrial fibrillation, but often times the reason why atrial fibrillation happens is not known. Risk factors have been identified that increase the chances of developing atrial fibrillation. However, atrial fibrillation can also occur in healthy individuals when these risk factors are absent (*Rosenthal et al., 2010*).

Atrial fibrillation (AF) is the most common cardiac rhythm disorder and it affects an estimated 2.3 million adults in the United States, the majority of whom are over the age of 65 years (*Feinberg et al., 1995*).