

Board of examiners

Prof. Dr. Steven Droogmans

Cardiology
Universitair Ziekenhuis Brussel-VUB

Prof. Dr. Bernard Cosyns

Cardiology
Universitair Ziekenhuis Brussel-VUB

Prof. Dr. Claudio Tondo

Cardiac Arrhythmia Research Center, Centro Cardiologico Monzino IRCCS
Milan, Italy

Prof. Dr. Tamas Szili-Torok

Erasmus Medical Centre
Rotterdam, Netherlands

Prof. Dr. Daniel Urbain, Chair

Hepato-Gastroenterology
Universitair Ziekenhuis Brussel – VUB

Prof. Dr. Pedro Brugada, Promotor

Heart Rhythm Management Centre
Universitair Ziekenhuis Brussel – VUB

Prof. Dr. Gian-Battista Chierchia, Co-promotor

Heart Rhythm Management Centre
Universitair Ziekenhuis Brussel – VUB

Prof. Dr. Carlo de Asmundis, Co-promotor

Heart Rhythm Management Centre
Universitair Ziekenhuis Brussel – VUB



PhD in Medical Sciences
2016-2017

INVITATION to the Public defence of

Giacomo MUGNAI

To obtain the academic degree of '**DOCTOR IN MEDICAL SCIENCES**'

Safety and Efficacy of Atrial Fibrillation Ablation: Evolution of the Cryoballoon Technique.

Thursday 24 November 2016

Auditorium **P. Brouwer**, 17:00

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

How to reach the campus Jette:

<http://www.vub.ac.be/english/infoabout/campuses>

Summary of the dissertation

The evolution of cryoballoon (CB) technology over the time brought significant improvements in terms of efficacy and safety profile. This dissertation sought to evaluate the various aspects of this promising technology from the first to the third generation. Conventional radiofrequency (RF) and first generation CB ablation showed similar success rates and safety profile. P-wave duration and dispersion significantly predicted atrial fibrillation (AF) recurrence following pulmonary vein (PV) isolation in patients with normal left atrial size. In the second generation CB, time to isolation and interval thaw times at 0°C were significant predictors of PV isolation durability; the temperature drop during CB ablation was significantly faster and attained significantly lower freezing degrees in patients with ongoing AF during the procedure. Patients with early recurrence of atrial tachyarrhythmias during the blanking period were 7 times more likely to develop late recurrences. The overall rate of serious adverse events related to AF ablation was around 2.9% and it did not significantly differ between RF and CB. Interestingly, patients in whom freezing was interrupted due to phrenic nerve injury (PNI) exhibited a similar outcome compared with those in whom freezing cycles were completed in the septal veins. Importantly, if a temperature of -38°C was not attained within 40 seconds, the occurrence of PNI during right superior PV ablation was virtually impossible. The femoral venous pressure technique significantly reduced the incidence of PNI. Finally, the novel third generation CB has been designed with a 40% shortened tip length. The rate of visualisation of PV potentials during third generation CB ablation was significantly higher compared with the former second generation technology (86% vs 67%).

Curriculum Vitae

Giacomo Mugnai (12/11/1983) obtained his medical doctor degree in 2008 at the University of Siena, with a mark of 110/110 cum laude. In 2009 he succeeded the Cardiology Residency Program entry examination at the University of Verona. In 2013, he attended the Heart Rhythm Management Centre of the Universitair Ziekenhuis Brussel - VUB directed by Prof. Pedro Brugada as a Research Fellow for 5 months. In 2014, Dr Mugnai terminated his postgraduate training in Cardiology at Verona University directed by Prof. Corrado Vassanelli obtaining the Cardiology Specialist Diploma with a mark of 70/70 cum laude. During the whole period of training, he was directly involved in clinical and research activities such as pathophysiology of atrial fibrillation, arrhythmology, implantable electronic devices. From September 2014 to August 2016, he performed a full 2-year training Fellowship in Cardiac Electrophysiology and Pacing at the Heart Rhythm Management Centre of the Universitair Ziekenhuis Brussel - VUB directed by Prof. Pedro Brugada. He followed a specific training in invasive electrophysiological procedures including conventional and complex ablation procedures as well as cardiac implantable electronic devices. His current assignment is Electrophysiologist assistant at the EP Department of Istituto di Cura Città di Pavia of Pavia (Italy), directed by Dr. Cesare Storti. He conducts invasive procedures including cardiac implantable electronic devices, and conventional and complex ablation procedures. Dr Mugnai is the (co) author of 51 articles published in international peer-reviewed journals, 24 of these as first author. He also contributed to the writing of book chapters