

# Exploring the essential aspects of the hybrid approach for atrial fibrillation

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# CHAPTER 12

## Impact and Valorization

### Impact and Valorization

Atrial fibrillation (AF) is a growing health problem worldwide, with a global prevalence in adults estimated between 2-4% in 2019.<sup>1</sup> Importantly, a 2-3-fold rise in this prevalence is expected in the next two to three decades,<sup>2</sup> which can be attributed to the ageing population, the better detection of AF and the growing incidence of comorbidities predisposing to AF.<sup>3</sup> Furthermore, AF significantly and adversely affects quality of life (QOL). This is related to the AF burden (the percentage of time an individual has AF), the incidence of AF-related complications (such as stroke or heart failure), hospitalizations and the need for medication such as oral anticoagulation or anti-arrhythmic drugs (AAD).<sup>3</sup> Importantly, AF is becoming one of the largest cardiovascular epidemics and transforming into a major public health concern worldwide. Consequently, AF places a substantial social and economic burden on society due to the increased utilization of health care resources.<sup>4</sup> This impact emphasizes the urgent need for preventive AF strategies by lowering risk factors predisposing for AF. As such, it is of paramount importance that health care professionals as well as patients are adequately informed about preventive- and optional rhythm control strategies to improve AF related symptoms, QOL and prevent recurrences.

Over the past years, invasive surgical AF ablation procedures via sternotomy requiring the use of cardiopulmonary bypass have developed into minimally invasive efficacious, feasible and safe beating heart alternatives. Meanwhile, the current European AF guidelines recommend minimally invasive thoracoscopic ablation, including hybrid AF ablation, for symptomatic, drug-resistant AF patients.<sup>3</sup> Therefore, the main aim of this thesis was to explore the beneficial aspects of hybrid ablation for AF.

In Maastricht, the ongoing adaptation and implementation of data evaluating the efficacy and safety has contributed to improved mid-term rhythm outcomes following thoracoscopic surgical and hybrid AF ablation. For example, we recently improved our thoracoscopic technique from a bilateral thoracoscopic approach to a unilateral left-sided approach.<sup>5</sup> Compared to a bilateral technique, a unilateral procedure has the potential advantage of preventing complications on the contralateral side, a faster recovery by lowering postoperative pain and minimal scarring of the skin, thereby potentially improving patient reported QOL and lowering health care costs. The unilateral thoracoscopic approach can safely and efficaciously be executed as a part of a hybrid strategy or

concomitant to a MIDCAB procedure. In the latter case, patients only need one hospitalization to treat both their coronary artery disease and AF in an all-in-one minimally invasive approach and do not always need to undergo a sternotomy anymore. Moreover, technical improvements in thoracoscopy and the close cooperation between the cardiac surgeon and the electrophysiologist have contributed to improved rhythm outcomes after thoracoscopic hybrid AF ablation, endeavoring a patient tailored treatment approach. For example, we found in our systematic review and meta-analysis that for persistent AF patients, hybrid ablation is superior to catheter ablation with regards to rhythm outcome.<sup>6</sup> This was also confirmed in our HARTCAP-AF randomized controlled trial, where the freedom of atrial tachyarrhythmias off AADs 1 year after a thoracoscopic hybrid ablation procedure was high and superior to catheter ablation (89% vs. 41%,  $P=0.002$ ).<sup>7</sup> Importantly, this implicates that the hybrid procedure could offer opportunities for patients with complex and persistent forms of AF, where medication or catheter ablation alone fail to restore sinus rhythm or improve QOL. In another systematic review and meta-analysis based on multicenter data, we found that surgical AF ablation, both stand-alone or concomitant, significantly improves patient reported outcomes such as QOL.<sup>8</sup> Moreover, thoracoscopic hybrid AF ablation improves left atrial contractility post-procedure and reduces left atrial volume. Especially when sinus rhythm is restored and the arrhythmia is terminated, left atrial contractility improves. These results are important, since the improved rhythm and functional outcomes may in turn lower rehospitalizations, AF socio-economic burden, AF-related symptoms and improve QOL.

### Future Perspectives

What still remains to be investigated is the long-term efficacy, safety and cost-effectiveness after thoracoscopic hybrid AF ablation and this should be compared to other (minimally invasive) rhythm control strategies. Although initially a hybrid procedure is probably more costly than a percutaneous or thoracoscopic approach only, it is expected that the investment in a hybrid procedure will be more cost-effective than both strategies in the long-term. It is suggested that even in the long-term, hybrid ablation is as safe as catheter ablation, but still more efficacious and requires fewer repeat ablations, fewer emergency visits and rehospitalizations. Therefore, we await the long-term results of the HARTCAP-AF trial where besides rhythm and safety outcomes, also quality of life and cost-effectiveness until 3 years of follow-up are evaluated.<sup>7</sup>

## Chapter 12

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