Contemporary atrial fibrillation management

Chapter 4

Summary - Scientific impact of publications

As all studies that were used in the cumulative thesis of this PhD project were published between 2019 and 2022, none of them was implemented in guidelines or consensus documents yet[11–16]. We truly hope for that in the future as six of our former studies made their way into the 2017 HRS/EHRA/ECAS/APHRS/ SOLAECE expert consensus statement on catheter and surgical ablation of AF[26–32].

Main publications for PhD thesis

Given the increase in health care costs worldwide, it is important to have more insight into both the effectiveness and costs of different treatments. Stakeholders of the medical sector will request data not only on medical outcomes but on economic consequences as well. Transparant decision making regarding the value of potentially curative therapies requires the collection and analysis of both, costs and effectiveness of treatment alternatives.

In the setting of our hospital, we were able to convince our main stakeholders in the local government and the hospital administration to allocate more money and personnel resources to EP. This resulted in a budget and case growth of more than 10% per year since 2020 and the opening of a second EP laboratory in the year 2020. Additionally, we opened a joint laboratory (EP added to an existing coronary angiography) in one of our sister hospitals in Vienna after deeply discussing health economic impacts, including actual cost and revenues, also based on the outcomes of our research.

Supporting publications for PhD thesis

Catheter ablation technology

After the publication of vHPSD ablation many EP laboratories in the world changed their standard therapy for PVI. Already in the years before electrophysiologists changed from low power RFCA with 25 to 30W to higher power and shorter

duration, mainly with the upcoming use of contact-force technologies[29]. The main idea was to provide safer RFCA, especially in respect to the posterior wall and the adjacent esophagus[31]. Posterior wall lesion with higher energy (40-50W) bur far lower ablation time should provide transmural lesions but reduce resistive heating of the esophageal wall resulting in risk for the creation of atrio-esophageal fistula. Further development of contact force technology with objective measures finally also provided a more effective and efficient RFCA[33]. The next development with vHPSD was made possible by the return of temperature-guided RFCA in contrast to power-guidance before. Very superficial thermocouples now made a temperature feedback possible, even despite irrigation[13]. This led to the possibility to deliver vHPSD impulses of only 4 seconds duration that made rather superficial lesions, enough to gain transmurality in the atria but without relevant temperature latency to adjacent structures.

In the light of health economics this technology also reduced ablation time, freeing resources in the EP laboratory. In our hospital this led to one additional PVI per day within the same lab time and convinced the administration to invest in this new ablation system in both our labs. Even the higher price of the catheter material pays off with the more efficient usage of the EP laboratory and staff, which are relevant factors in the hospital's cost calculation.

Treatment targets for ablation of AF

Results of PVI in persistent AF has faced perceived low success rates since the beginning of RFCA. Different add-on ablations have been tried, but were not successful in RCT, resulting in PVI still being the cornerstone of ablation even in persistent AF[2]. Data on our ERASE-AF trial have been presented in various meetings after publication end of 2022 and has resulted in a lively discussion on the data and the new treatment approach. It will have an impact on the field of how we target persistent AF patients in future, but for sure adaption will be dependent on how this data is implemented into the new ESC AF guidelines in 2024. We are confident that this method will get a higher recommendation as all other failed add-on ablation therapies.

I see a big chance for this method of treating persistent AF, as it is easy to implement for any user of RFCA. Personally, – as electrophysiologist – I very much

like the idea of bringing back substrate mapping into EP and not only do a rather anatomical ablation as PVI only. With newer mapping catheters the method is even faster to perform with higher point density. Still, the benefit has to be proven in a larger scale, but the very precise follow-up with a high percentage of implanted loop recorders makes the data quite robust.

PVI as first-line therapy vs. AAD

As three recent independent RCT have shown a substantial treatment benefit of Cryoablation over AAD this method has the potential to get a higher recommendation as first-line therapy for paroxysmal AF in future guidelines.

Not only first-line PVI but overall an earlier restoration of sinus rhythm by PVI or AAD could be one of the big paradigm shifts in the next AF guidelines after publication of the EAST-AF trial[24]. Still, we cannot claim a mortality or morbidity benefit of PVI after CABANA, but these data are reassuring for an early rhythm-control strategy.