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Ablation of persistent atrial fibrillation: the added value of hybrid

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Not only is there a rising enthusiasm for hybrid approaches in the treatment of persistent atrial fibrillation (AF), but also more and more reports on its efficacy and safety are being published [1–3]. The concept of *attacking the atrial substrate* from the epicardium and endocardium seems only logical given the electropathological complexity of non-paroxysmal AF and the incomplete understanding of the underlying pathophysiological mechanisms. Our initial report on hybrid AF ablation introduced an approach that combined epicardial thoracoscopic ablation with transvenous endocardial ablation [4]. In this and following reports, epicardial ablation was performed with the use of biparietal bipolar radiofrequency (RF) clamps and linear uniparietal bipolar RF devices [4–6]. Besides this, other epicardial ablation strategies have been incorporated in a one- or two-staged hybrid approach [1, 7].

A good example is the current report of Lapenna *et al.* [7] reporting on a staged hybrid treatment of 50 patients with non-paroxysmal AF and dilated left atria. In this study, the epicardial part consisted of a box lesion ‘on bloc’ using a flexible catheter that allows the application of uni- and bipolar RF (Cobra-Fusion). After a mean of 2.2 months, 92% of patients underwent the 2nd stage endocardial procedure, in which touch-up ablation of surgical lesions was performed in 54% of patients and a cavo-tricuspid isthmus line was performed in 17% of patients. At 2 years, 65% of patients were in sinus rhythm without the use of antiarrhythmic drugs or electrical cardioversion and 82% were in sinus rhythm allowing antiarrhythmic drugs or electrical cardioversion. The authors are to be congratulated on these results and the completeness of their follow-up (98%).

It is important to note that continuous implantable rhythm monitoring (ILR) was used for follow-up in this study [7]. To date, most reports on surgical or hybrid AF ablation are based on follow-up using Holter monitoring. Given the large temporal difference in rhythm assessment between both methods, the use of ILR potentially could lead to much lower success rates than the overall reported success rate of 70% after hybrid approaches using Holter monitoring [3]. It is reassuring that the current study

of Lapenna *et al.* shows otherwise, and the results stand in striking contrast to those of the recent study of Haldar *et al.* [8]. The CASA-AF trial, randomizing non-paroxysmal AF patients to either thoracoscopic or catheter AF ablation, the follow-up with ILR showed that only 26% of patients were arrhythmia-free 1 year after thoracoscopic AF ablation [8]. However, a more extensive ablation strategy in the catheter group and potential limitation in surgical experience (only 20 procedures were minimally required) are important factors that contributed to these disappointing results, besides the fact that it was a none hybrid approach [8].

Despite the good results, the study of Lapenna *et al.* also has 2 major drawbacks. First, the left atrial appendage (LAA) was not addressed. It is our opinion that LAA management is key in surgical AF treatment. Next to the potential benefit on stroke rate [9], electrical isolation following LAA clipping, stapling or resection not only prevents triggers originating from the LAA but also results in mass reduction of the AF substrate, both mechanisms that can improve success rates on the long term [10]. In their study, Lapenna *et al.* could have addressed the LAA via the transverse sinus or by adding a short left thoracoscopic procedure. Second, in less than half of the patients (46%), the box was isolated during the endocardial procedure. This indicates that the Cobra-Fusion technique, despite its meticulous application, is not very effective in creating long-lasting transmural lesions but also demonstrates the added value of a hybrid approach.

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