



# Left atrial appendage therapies: a new topic for the Heart Team

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## Introduction

A multidisciplinary approach makes intuitive sense in medicine with its beneficial value increasing with the complexity of the disease, and frailty of patients. In atrial fibrillation (AF), the Heart Team approach is an accepted “patient-centered” treatment strategy (1). From the patient standpoint, shared decision making improves patient and family education about available therapeutic strategies leading to an increased awareness and participation and more informed consent, so that patient expectation will be met as fully as possible. For cardiologists/electrophysiologists and the surgeons, a multidisciplinary discussion is of paramount importance due to the complex pathophysiology of AF, triggers, risk factors, and predictable increase of social and economic burden (1). The working together, overcoming the potential bias of an individual physician approach, may help to focus on specific patient considerations and expectations in the new culture of “holistic care”. A joint participation in procedures may not only improve the skill sets of the involved personnel but also elevate the cognitive interchange, optimize resources, and continue education by sharing knowledge (2). Moving from a speculative perspective to the clinical practice of AF treatment, despite excellent results for persistent AF using the Cox-maze IV procedure, based on extensive lesions including the left atrial appendage (LAA), the much less invasive catheter ablation is the mainstream of interventional treatment with excellent outcomes for paroxysmal AF but less successful results for persistent AF after multiple procedures and limited lesion set not including the LAA (1,3,4). If invasiveness and morbidities

of surgery have been a drawback in the past, the new rapidly evolving totally thoracoscopic cardiac surgery thanks to its extreme minimally invasiveness and consistent safety and efficacy outcomes has regained interest of the electrophysiologists community in a Heart Team-based hybrid approach that yield excellent results in line with Cox-maze IV procedure at midterm for arrhythmias: the LAA due to its multiple roles in AF is part of the discussion (5).

## Rationale for the Heart Team in LAA management

From the patient’s perspective, the main goals of an AF treatment are to improve quality of life and discontinue antiarrhythmics/anticoagulants. Pulmonary vein isolation is the interventional corner stone, while the potential role of other trigger sites such as LAA is less well established (1). The Belief trial and subsequent papers, sharing with surgery the rationale of extensive ablations, have documented up to 46% relative risk reduction of AF burden when LAA is concomitantly isolated (6). If the effective role of the appendage is a topic of active investigation, AF treatment clinically is based on rhythm/rate control and prevention of strokes, in which LAA plays a role in both.

In case of rhythm control strategy, LAA electrical isolation may be achieved by transcatheter endocardially but is technically demanding, time consuming and therefore, not widely diffused. When successfully performed only endovascular occlusion allows concomitant anticoagulants and antiarrhythmics discontinuation (1). An alternative is the epicardial standalone totally thoracoscopic approach allowing simple, effective simultaneous LAA electrical

isolation and occlusion with high efficacy and safety profiles and consequently, drugs discontinuation after the blanking period (7-9).

If rate control strategy is chosen managing anticoagulation is even more a critical issue. In these patients, LAA occlusion is a valid option, achievable endo- or epi-cardially both with non-overlapping anatomical and technical restrictions but similar excellent outcomes (1,8,9). If adhesions and severe diastolic dysfunction are drawback for epicardial devices, the Achilles's heel of all endovascular devices are: device thrombosis, peridevice leaks and mandatory antithrombotic therapy. Endocardial approach plays the role of the lion but requires post procedure antiplatelet therapy (1), and in case of device thrombosis/leak more aggressive pharmacological therapy: the clinical dilemma is represented as bleeding remains an issue with any antiplatelet regime (1,8).

Standalone totally thoracoscopic epicardial, lacks randomized controlled trials (RCTs) but is supported by continuously upcoming papers of larger series (8). Since no foreign material is implanted inside the heart, potentially no antithrombotic therapy is required filling the gap left by off label endovascular implantation without/reduced/shortened period of antiplatelets agents in frail patients, such as those with gastrointestinal (GI) bleeding disorders not amenable of definitive treatment always associated with chronic bleeding on aspirin, cerebral amyloid angiopathy, some intracranial hemorrhages, hematologic diseases with thrombocytopenia and clotting disorders. In high volume LAA management centers it is common to equate the physician-patient goal of anticoagulant discontinuation with the "least invasive" but this approach may not necessarily be the optimal strategy especially in the long term. Given the ideal device and technique for LAA occlusion is not available, a joint discussion might have the great merit of transcending the limitation of an established care offering the most up to date treatment options allowing proper patient recruitment (1,8,9). There seems not to be evidence to support off label/suboptimal transcatheter implantation if an epicardial approach is available or a multicenter networking is set up in the patient interest. However, further studies are needed. The SALMANDER study on endo/epi-devices/procedures will evaluate device specific pros and cons and will shed light on subgroups of individuals to a greater benefit of a given approach (10).

## Conclusions

All current devices have high safety and efficacy profiles,

the real issue is to better understand the options of an endo/epicardial approach. The ultimate device should be suitable for minimally invasive approach, easy, fast, safe, stable, electrically isolating, cheap, and effective without antithrombotic therapy. For the time being, a multidisciplinary approach should be favored switching from a "device-driven"- "operator-skills-tailored" patient selection to a "patient-centered decision making process"- "patient-tailored treatment option" and this can only be done in the Heart Team. Finally, as the field of less invasive approaches continues to evolve, future training programs should focus on moving from a competitive perspective of different strategies to a cooperative attitude, investing in collaborative skills, and advanced theoretical and practical expertise on LAA therapies. This would move towards a more Darwinian evolution of everyday medical practice on our potentially most lethal embryonic remnant.

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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