

An original management of focal atrial tachycardia originating from a giant left atrial appendage



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Introduction

The left atrial appendage (LAA) was an uncommon location of focal atrial tachycardia. Radiofrequency catheter ablation allows us to have a success rate of about 70% after several procedures according to the series. Herein, we describe an original hybrid approach to treat radiofrequency-resistant atrial tachycardia originating from a giant LAA on the basis of an accurate analysis of anatomy by 3-dimensional (3D) modeling.

Case report

A 55-year-old woman was referred to our institution for an ablation procedure. Two years ago, she had ablation of symptomatic paroxysmal atrial fibrillation. She remained asymptomatic during 1 year, presenting a recurrent incessant atrial tachycardia despite antiarrhythmic treatment (Figure 1). Two conventional endocardial ablation procedures were performed. However, interventions were technically difficult because of the origin of atrial tachycardia in the LAA and because of its gigantism (Figure 2A). A hybrid (electrophysiology interventional plus surgical) approach during the same procedural time has then been proposed. In order to assess the feasibility of the intervention, a 3D reconstruction of the left atrium and LAA had been previously performed to test the possibility of surgical exclusion (Figure 2B).

The procedure was performed under general anesthesia, with an electrophysiological approach validating first the origin of focal atrial tachycardia in the LAA by activation mapping (CARTO 3, Biosense Webster Inc, Diamond Bar, CA) (Figure 3A). In a second step but at the same procedural time, the surgeon performed LAA exclusion with a

KEY TEACHING POINTS

- The management of symptomatic atrial tachycardia resistant to drug therapy must be done by endocavitary ablation.
- Computed tomography scan of the left atrium should be performed frequently. It can highlight anatomical particularity that will lead to an adaptation of the ablation procedure.
- Success rate of ablation of an atrial tachycardia originating from the left atrial appendage is close to 70% according to the series. The thoracoscopic surgical approach appears to be a good alternative after failure of endocavitary ablation.

dedicated clip (AtriClip, AtriCure, Inc, West Chester, OH) by left unilateral thoracoscopy (Figure 3B). We could then observe simultaneously a progressive slowing down of atrial tachycardia with a spontaneous return to sinus rhythm. At the end of the procedure, conduction block was tested by pacing the LAA at 12 mA with a bipolar catheter. The post-operative period was simple, and the patient was discharged after 5 days in sinus rhythm. She had no recurrence of supraventricular tachycardia during 6 months of follow-up without antiarrhythmic drugs.

Discussion

This case demonstrates the interest and efficacy of the surgical hybrid approach in the management of focal atrial tachycardia unusually coming from the LAA. Indeed, the success rate of radiofrequency ablation in this location is low, around 10%.¹ There are only a few descriptions and reports of minimally invasive surgical atrial appendectomy in the management of atrial tachycardia refractory to radiofrequency ablation.² To date, a single description has been

KEYWORDS Focal atrial tachycardia; Hybrid approach; Left atrial appendage
(Heart Rhythm Case Reports 2018;4:135–137)

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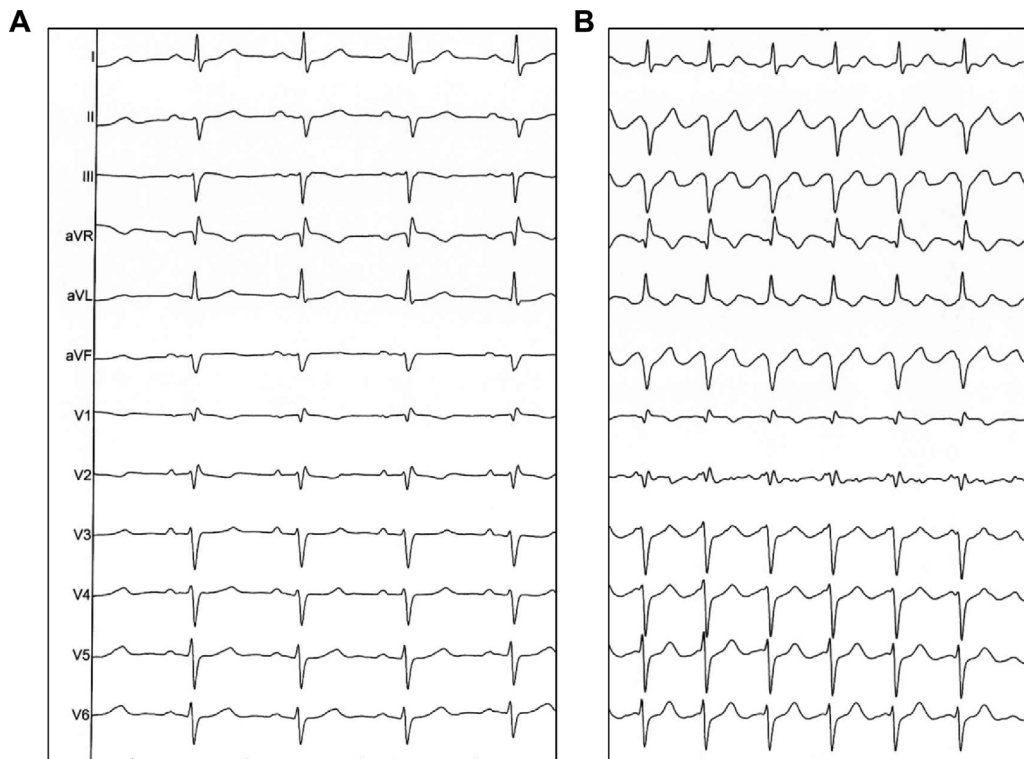


Figure 1 Twelve-lead electrocardiogram showing (A) a sinus rhythm after left atrial appendage exclusion and (B) a narrow QRS tachycardia with positive P waves in leads II-III-aVF-V₂ to V₆ and negative P waves in leads V₁-I-aVL, suggesting a left atrial appendage origin.

made by Benussi et al³ in 2011 of thoracoscopic exclusion with the AtriClip device of the LAA, reducing the perioperative risk.

The originality of our case is also due to the gigantism of the LAA, complicating the management both by conventional radiofrequency ablation and by surgical ablation. In addition, we show here for the first time the interest of previously analyzing the feasibility of LAA exclusion with the help of 3D modeling realized by a 3D printer.

Finally, we highlight the importance of combined electrophysiological endocardial time and surgical time of exclusion

by using the AtriClip device. The electrophysiology study allows us to confirm by activation mapping the origin of the left atrial tachycardia and to validate conduction block after LAA exclusion between this structure and the remaining left atrium.

Conclusion

This case illustrates the importance of imaging in the management of atrial tachycardia. The hybrid approach appears to be a feasible and attractive alternative for the treatment of atrial tachycardia originating from the LAA.

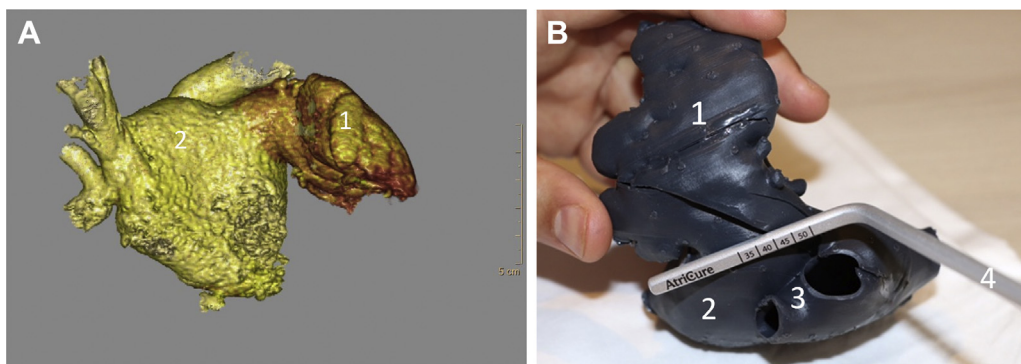


Figure 2 A: Front view of a computed tomography scan reconstruction centered on the left atrial appendage (1), which had a volume comparable to that of the left atrium in this patient (2). B: Modeling of the giant left atrial appendage by the 3-dimensional printer. Measurement of the base of the left atrial appendage is done in order to choose the proper size of the AtriClip device. 1 = Left atrial appendage; 2 = left atrium; 3 = left pulmonary veins; and 4 = calibration clamp (AtriCure, Inc).

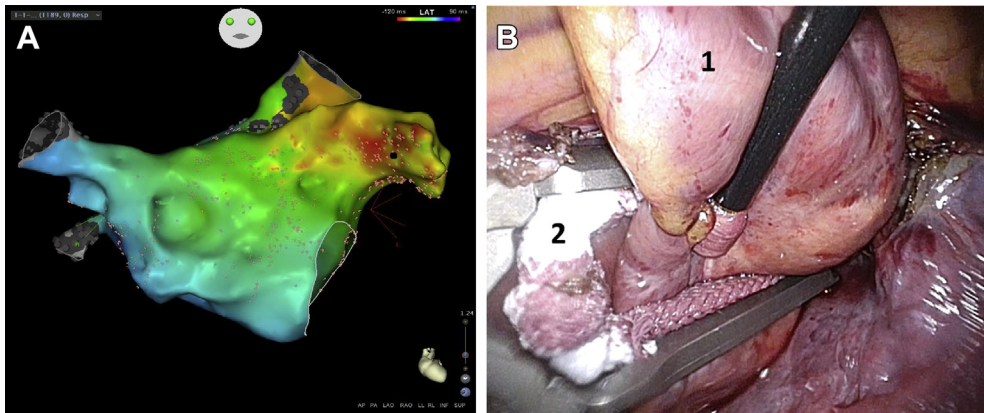


Figure 3 A: Focal atrial tachycardia originating from the left atrial appendage by the activation map (CARTO 3). B: Left thoroscopic view of the AtriClip device (2) in place on the base of the left atrial appendage (1).

Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at <https://doi.org/10.1016/j.hrcr.2017.10.016>.

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