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CASE REPORT

Late atypical atrial flutter after ablation of atrial fibrillation[☆]

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Abstract Cardiac surgery for structural heart disease (often involving the left atrium) and radiofrequency catheter ablation of atrial fibrillation have led to an increased incidence of regular atrial tachycardias, often presenting as atypical flutters. This type of flutter is particularly common after pulmonary vein isolation, especially after extensive atrial ablation including linear lesions and/or defragmentation.

The authors describe the case of a 51-year-old man, with no relevant medical history, referred for a cardiology consultation in 2009 for paroxysmal atrial fibrillation. After failure of antiarrhythmic therapy, he underwent catheter ablation, with criteria of acute success. Three years later he again suffered palpitations and atypical atrial flutter was documented. The electrophysiology study confirmed the diagnosis of atypical left flutter and reappearance of electrical activity in the right inferior pulmonary vein. This vein was again ablated successfully and there has been no arrhythmia recurrence to date.

In an era of frequent catheter ablation it is essential to understand the mechanism of this arrhythmia and to recognize such atypical flutters.

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PALAVRAS-CHAVE

Flutter auricular atípico;
Ablação percutânea de fibrilhação auricular;
Re-ablação

***Flutter* auricular atípico tardio após ablação de fibrilhação auricular**

Resumo A existência de cardiopatia estrutural, a história de cirurgia cardíaca prévia (frequentemente envolvendo a aurícula esquerda) e a ablação percutânea da fibrilhação auricular conduziram a um aumento da incidência de taquicardias auriculares regulares, frequentemente apresentando-se como *flutters* atípicos. Este tipo de *flutter* é particularmente frequente após isolamento das veias pulmonares, especialmente após extensa ablação auricular, incluindo lesões e/ou desfragmentação lineares.

Os autores descrevem o caso de um homem, 51 anos de idade, sem antecedentes patológicos conhecidos, encaminhado para a consulta de cardiologia, em 2009, por fibrilhação auricular paroxística. Após insucesso da terapêutica antiarrítmica, foi referenciado para ablação percutânea, com critérios de sucesso agudo. Três anos depois, reiniciou queixas de palpitações e foi documentado *flutter* auricular atípico. O estudo eletrofisiológico confirmou o diagnóstico de *flutter* atípico esquerdo e reaparecimento de atividade elétrica na veia pulmonar inferior direita. Fez re-ablação da veia recanalizada com sucesso, sem qualquer recorrência arritmica até ao momento.

Na era da ablação percutânea, é essencial perceber o mecanismo da arritmia e reconhecer a existência destes *flutters* atípicos.

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Case report

The authors describe the case of a 51-year-old man, referred for a cardiology consultation in 2009 for paroxysmal atrial fibrillation (AF), the first episode of which was documented in December 2008, lasting 18 hours and terminating spontaneously; he had no other relevant medical history. Further investigation by transthoracic echocardiography revealed no structural heart disease, normal cardiac chamber dimensions, and preserved biventricular systolic function with no evidence of diastolic or valve dysfunction; laboratory tests, including renal, thyroid and liver function, showed no significant alterations. Exercise testing (Bruce protocol lasting 8 min 30 s, rate-limited, asymptomatic) revealed no significant electrocardiographic alterations or evidence of cardiac rhythm disturbances during exertion or recovery. In 2010 he reported several episodes of palpitations (European Heart Rhythm Association [EHRA] classification III), and AF was documented on Holter ambulatory monitoring. Initially these episodes occurred around once a month. Therapeutic options were discussed with the patient and it was decided to begin antiarrhythmic therapy with flecainide and bisoprolol; since his CHA₂DS₂VASc score was 0, antithrombotic therapy was not prescribed.

Despite antiarrhythmic therapy, the patient had several symptomatic recurrences of AF and was therefore referred for catheter ablation. In 2011 he underwent radiofrequency pulmonary vein isolation, with criteria of acute success. In 2014 he again suffered palpitations and went to the emergency department, where atypical atrial flutter (AFL) with rapid ventricular response was documented (Figure 1). During this episode he was prescribed an anticoagulant, heart rate control was begun with bisoprolol, and electrical cardioversion was scheduled for three weeks later. This was performed successfully, anticoagulation was maintained for four weeks and antiarrhythmic therapy was again prescribed

with propafenone and bisoprolol. However, symptomatic AFL recurred several times and it was therefore decided to perform electrophysiology study (EPS) and AFL ablation.

In March 2015 another EPS was performed immediately preceded by computed tomography angiography (CTA) of the left atrium and pulmonary veins, even though their anatomy was known from the previous procedure, to quantify left atrial volumes, which also excluded pulmonary vein stenosis. The CTA images were used for electroanatomical mapping of the left atrium during the EPS, although the images were not integrated.

A quadripolar catheter was introduced into the right atrium or His position and a decapolar catheter was introduced into the coronary sinus, both by femoral vein catheterization. Based on the previous pulmonary vein isolation and the algorithms for locating the circuit according to the morphology of flutter (F) waves on the surface electrocardiogram (ECG), a double transseptal approach was immediately performed, introducing a decapolar circular catheter (Lasso, Biosense) and an irrigated-tip ablation catheter with pressure sensor (SmartTouch), which were advanced to the left atrium. As the Lasso catheter was being manipulated near the inferior pulmonary vein, to map the anatomy of the left atrium, the AFL ceased due to mechanical block (Figure 2).

Mapping of the left atrium only showed electrical activity in the right inferior pulmonary vein (Figure 3). Programmed electrical stimulation of the atrium was performed with three base cycles and three coupled extrastimuli until the refractory period without AFL or AF being induced. Since AFL was not inducible and could therefore not be mapped in detail, the right inferior pulmonary vein was isolated, with criteria of acute success and no periprocedural complications (Figure 4).

At six-month follow-up the patient reported clear symptomatic improvement, with only sporadic palpitations.

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