

Ablation of Atrial Fibrillation in a Patient with Dilated Cardiomyopathy

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SUMMARY

Invasive treatment of atrial fibrillation in patients with dilated cardiomyopathy with suspicion of tachycardiomyopathy represents a difficult and controversial decision.

This presentation describes a patient of 57 years, hospitalized for progressive congestive heart failure. The electrocardiogram showed atrial fibrillation of high ventricular response and the echocardiogram revealed dilated cardiomyopathy with severe impairment of the left ventricular function and severe mitral regurgitation without organic valvular compromise. Coronary artery disease was ruled out. Radiofrequency ablation was presented as the best alternative for his condition.

The patient recovered sinus rhythm, with which he remains since last 2 years, with asymptomatic evolution and improvement of all echocardiographic parameters.

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Key words

> Atrial Fibrillation - Dilated Cardiomyopathy - Radiofrequency Catheter Ablation

Abbreviations

LA	Left Atrium	ECG	Electrocardiogram
AV	Atrioventricular	AF	Atrial Fibrillation
CPK	Creatine Phosphokinase	HR	Heart Rate
ECV	Electrical Cardioversion	LVSF	Left Ventricular Systolic Function

BACKGROUND

Atrial fibrillation (AF) is the most common arrhythmia and is associated with an increased risk of embolic events, congestive heart failure and total mortality.

In patients with dilated cardiomyopathy, the risk of developing AF is increased sixfold. A greater degree of impairment in ejection fraction, greater likelihood of developing AF. The loss of atrial contribution to ventricular filling, high heart rate (HR), an irregular heartbeat and the embolic risk are some of the adverse effects of AF in patients with heart failure.

It is known that patients with chronic AF with heart rate poorly controlled, develop dilated cardiomyopathy. (1-4) Even patients with frequent episodes of paroxysmal AF may lead to tachycardiomyopathies that disappear with the elimination of the arrhythmia. (5) The irregularity of RR intervals could also participate in the development of ventricular dysfunction.

CASE REPORT

A male patient of 57 years with a history of diabetes mellitus type 2, hypertension and former smoker, in 2002, he evolves with progressive dyspnea with signs

of heart failure, for what he was admitted to the coronary care unit. ECG to admission: AF rhythm, HR: 140 beats / min, 0 ° axis, QRS: 100 msec, poor R progression in the anterior face, chest x-ray with signs of pulmonary congestion and in the laboratory, negative troponin and CPK. The echocardiogram (Figure 1) showed global contractile dysfunction of the left ventricular with ejection fraction between 30% and 35% and ventricular dilatation (end diastolic diameter: 65mm/end-systolic diameter: 52mm, left atrium: 46mm) without organic valvular disease. Thrombuses were discarded in the left atrium (LA) by transesophageal echocardiogram.

Charging and maintenance of amiodarone were indicated and electrical cardioversion was attempted (ECV) on three occasions, with persistent high rate of AF with heart rate. The clinical picture was interpreted as probable tachycardiomyopathy.

At 5 months, for persisting with FA of difficult frequency control, we carried out AF ablation with antral isolation technique of the pulmonary veins by fluoroscopic guidance and posterior ECV, resulting in sinus rhythm at discharge. One month later, the

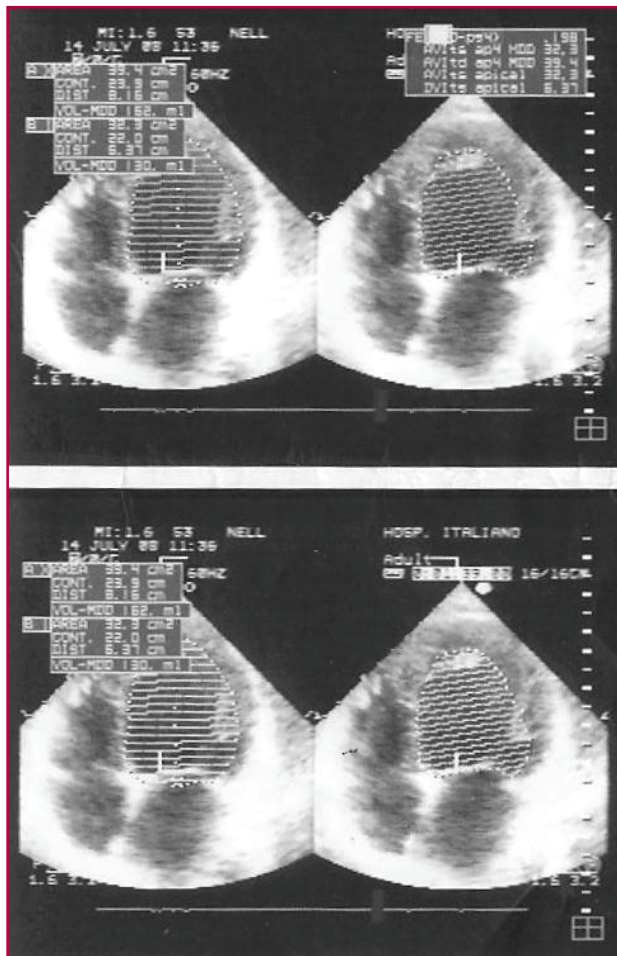


Fig. 1. Pre-ablation echocardiogram.

patient developed persistent AF and it was decided to control HR with beta blockers, digoxin, and anticoagulation with warfarin.

For the study of cardiomyopathy in 2004, a coronary angiography was carried out, which showed arteries without injured, and in 2007 a cardiac MRI, which showed severe impairment of LVSF and volume of the left atrium (LA) of 154 cm³.

To present difficult management in the control of HR in April 2008, a second ablation of AF was carried out with antral isolation of four pulmonary veins, plus line on the left atrial roof and mitral isthmus electroanatomic mapping (EnSite) (Figure 2) and guided by intracardiac echo (Figure 3) with sinus rhythm with biphasic ECV pre-procedure.

In outpatient follow-up was continued with four serial Holter studies, each of whom had sinus rhythm. In June 2009, it was carried out a new echocardiogram of control (Figure 4), which showed good LVSF, preserved diameter (5.3 / 3.3cm), mild mitral insufficiency, dilated LA (5cm). Since the last hospitalization he develops asymptomatic to dyspnea, with good functional class.

The patient continues with amiodarone, warfarin, carvedilol, losartan and oral hypoglycemic agents.

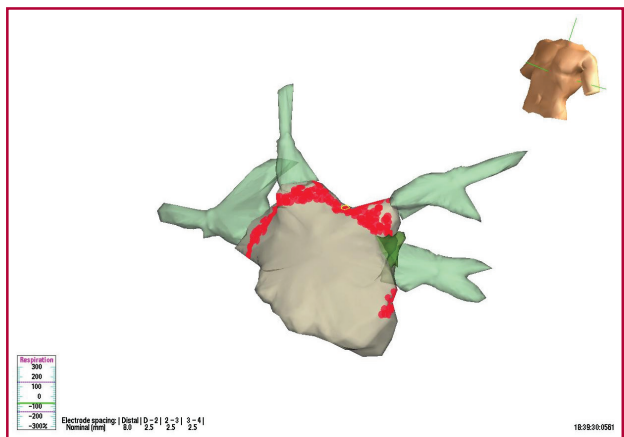


Fig. 2. Image created with EnSite in which are observed left atrium, pulmonary veins and injuries (red dots) to get the isolation of the veins.

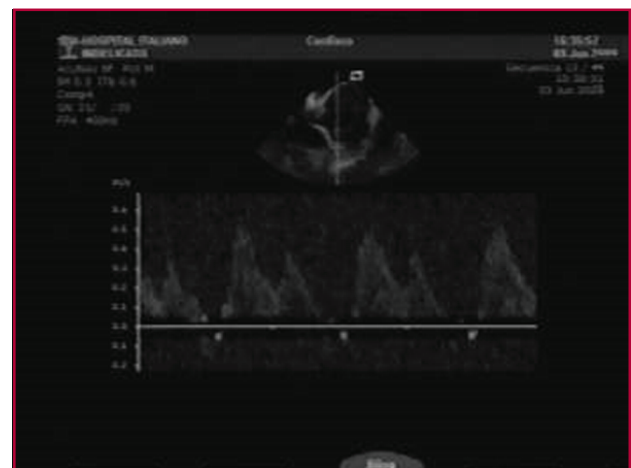


Fig. 3. Image obtained with intracardiac echocardiogram in which is visualized the left inferior pulmonary vein.

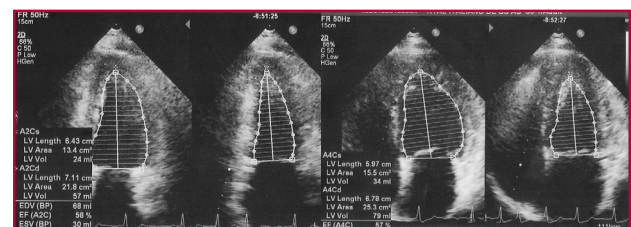


Fig. 4. Post-ablation echocardiogram.

DISCUSSION

The development of dilated cardiomyopathy is common in patients with AF with uncontrolled ventricular response. (1)

A few years ago, studies were published that showed non clinical differences in the management of AF in rhythm or heart rate control. (2) This was probably due to poor performance of drug treatments to control the rhythm, since a post hoc report of the AFFIRM study showed better survival in patients who remained in sinus rhythm versus those who continued with AF. (6)

They have been proposed the AV nodal ablation and implantation of a resynchronizer as a therapeutic alternative for rate control, but in the long-term follow up showed no changes in left ventricular function. (7)

Some studies show that the recovery of sinus rhythm in patients with tachycardiomyopathy favours the recovery of left ventricular function and quality of life. (8, 9)

Even a study shows in these kind of patients better outcomes in terms of quality of life with the FA ablation and the recovery of sinus rhythm that with AV nodal ablation and implantation of a resynchronizer. (10)

Although antiarrhythmic therapy is considered the first therapeutic line in patients with AF, the recurrence of atrial fibrillation is high and reaches 44-67% within the first year post-ECV.

In recent years, there has been significant progress in the field of transcatheter ablation of this arrhythmia, which has resulted in low rates of complications and a better prognosis for these patients.

The method of AF ablation differs depending on the characteristics of presentation of the arrhythmia and cardiopathy that the patient suffers. In patients with persistent AF we act on the electrophysiological and structural changes that predispose to reentry, unlike patients with paroxysmal AF in which acts on the triggers.

The isolation of pulmonary veins is the current mainstay of this type of procedure, but the addition of new sites of ablation, the endpoints of the procedure, the patient selection and appropriate monitoring methods are still controversial.

Ventricular dysfunction probably due to tachycardiomyopathy and irregular RR intervals might sometimes be normalized with the return to sinus rhythm despite the chronicity of the arrhythmia, as it is observed in this case.

Hence the importance in the accurate selection of patients for ablative AF treatment and we do not discard all those with poor ventricular function or dilated cardiomyopathy.

Some studies in progress as CASTLE-AF, (11) that evaluates the AF ablation versus conventional treatment in patients with left ventricular dysfunction, they give us the definitive answer about the utility of AF ablation in these patients.

cardiomiopatía representa una decisión difícil y controversial. En esta presentación se describe el caso de un paciente de 57 años, internado por insuficiencia cardíaca congestiva progresiva. En el electrocardiograma se evidenció fibrilación auricular de alta respuesta ventricular y en el ecocardiograma, miocardiopatía dilatada con deterioro grave de la función del ventrículo izquierdo e insuficiencia mitral grave sin compromiso orgánico valvular. Se descartó enfermedad coronaria. Se planteó la ablación por radiofrecuencia como la mejor alternativa para su cuadro. El paciente recuperó ritmo sinusal, con el cual permanece desde hace 2 años, con evolución asintomática y mejoría de todos los parámetros ecocardiográficos.

Palabras clave > Fibrilación auricular - Cardiomiopatía dilatada - Ablación de radiofrecuencia por catéter

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RESUMEN

Sarcoidosis cardíaca: descripción de tres casos

El tratamiento invasivo de la fibrilación auricular en pacientes con miocardiopatía dilatada con sospecha de taqui-