CorSalud 2013 Jul-Sep;5(3):301-304

CorSalud

Cuban Society of Cardiology

Case Report

Cardiocentro ERNESTO CHE GUEVARA SANTA CLARA CUBA

Ischemic atrial fibrillation

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ARTICLE INFORMATION

Received: 25 de marzo de 2013
Accepted: 18 de abril de 2013

Competing interests
The authors declare no competing interests

Acronyms
AF: atrial fibrillation
AMI: acute myocardial infarction
PCI: percutaneous coronary intervention

On-Line Versions:
Spanish - English

ABSTRACT
Atrial fibrillation is the most common arrhythmia in the peri-acute myocardial infarction period, although its presence associated only to the acute phase of ischemia and its immediate cessation after early and effective revascularization is anecdotal in the literature, with a consequent lack of evidence for further treatment. A clinical case in which early coronary intervention managed to achieve a cardioversion of atrial fibrillation to sinus rhythm during an acute myocardial infarction is reported. Subsequently, it is discussed the strategy that must be followed with regard to arrhythmia in a patient with good clinical outcome after the event.
Key words: Atrial fibrillation, Acute myocardial infarction, Percutaneous coronary intervention

Fibrilación auricular isquémica

RESUMEN
La fibrilación auricular es la arritmia más frecuente en el período peri-infarto agudo de miocardio, aunque su presencia asociada tan solo a la fase de isquemia aguda y su inmediato cese tras una revascularización precoz y efectiva es testimonial en la literatura, con la consiguiente falta de evidencia para su posterior tratamiento. Se presenta un caso clínico en el que el intervencionismo coronario precoz consiguió la cardioversión a ritmo sinusal de una fibrilación auricular en el curso de un infarto agudo de miocardio, posteriormente se discute la estrategia a seguir en torno a la arritmia en un paciente con buena evolución clínica tras el suceso.
Palabras clave:
Palabras clave: Fibrilación auricular, Infarto agudo de miocardio, Intervencionismo coronario percutáneo

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INTRODUCTION

Atrial fibrillation (AF) is the most common arrhythmia in the peri-acute myocardial infarction (AMI) period[1], although its presence associated only to the acute phase of ischemia and its immediate cessation after early and effective

revascularization is anecdotal in the literature, with a consequent lack of evidence for further treatment. A clinical case in which early coronary intervention managed to achieve a cardioversion of atrial fibrillation to sinus rhythm during an acute myocardial infarction is reported. Subsequently, it is discussed the strategy that must be followed with regard to arrhythmia in a patient with good clinical outcome after the event.

CASE REPORT

A 68-year-old male with a history of hypertension, hypercholesterolemia, and smoking presents acute coronary syndrome with inferolateral ST elevation in Killip I, with less than 2 hours of evolution, and previously unknown atrial fibrillation. Faced with the impossibility of performing primary angioplasty within 90 minutes, due to remoteness, it was decided to performed fibrinolysis with tenecteplase, enoxaparin, aspirin and clopidogrel. He was moved to his hospital of reference without showing clinical improvement or normalization of the ST segment at 60 minutes (Figure 1A). Therefore, according to the protocol, an emergency coronary angiography was performed, which showed atherothrombotic occlusion of the middle right coronary artery (TIMI 0 flow, Figure 1B).

Then, a rescue angioplasty with aspiration thrombectomy was performed (Pronto V3), followed by conventional stent implantation (Bionert IHT) of 4.0 x 28 mm on the occluded segment (Fig. 2A). A good angiographic result was achieved, TIMI 3 flow, resolution of pain and normalization of ST segment, which was accompanied by immediate and spontaneous recovery of sinus rhythm (Figure 2B).

The left coronary showed diffuse aterocalcification, predominantly in the anterior descending artery, without severe or angiographically significant stenosis susceptible to percutaneous coronary intervention (lesion at the apical anterior descending level). A ventriculography showed preserved systolic function, with localized hypokinesia at the mid-lower level.

The patient improved without new ischemic events or recurrence of AF, and was discharged with dual antiplatelet therapy (aspirin and clopidogrel), atorvastatin and bisoprolol.

COMMENT

AF is the most common arrhythmia in the peri-AMI period. Reports on its incidence in several series have varied from 6% to 21% of cases, and in most of the publications it is associated with a worse prognosis[1]. These observations are very heterogeneous from a chronological point of view, without evaluating only the time of occurrence of acute ischemia, and most of them consider arrhythmia including the hospitalization period, when its occurrence may also be favored by old age, poor hemodynamic status post-myocardial infarction, ventricular dysfunction, ischemic mitral regurgitation, presence of diabetes mellitus and other factors that could explain the worse prognosis and long-term recurrences. It is also noteworthy, with respect to the above mentioned studies, that the treatment of AMI with percutaneous coronary intervention

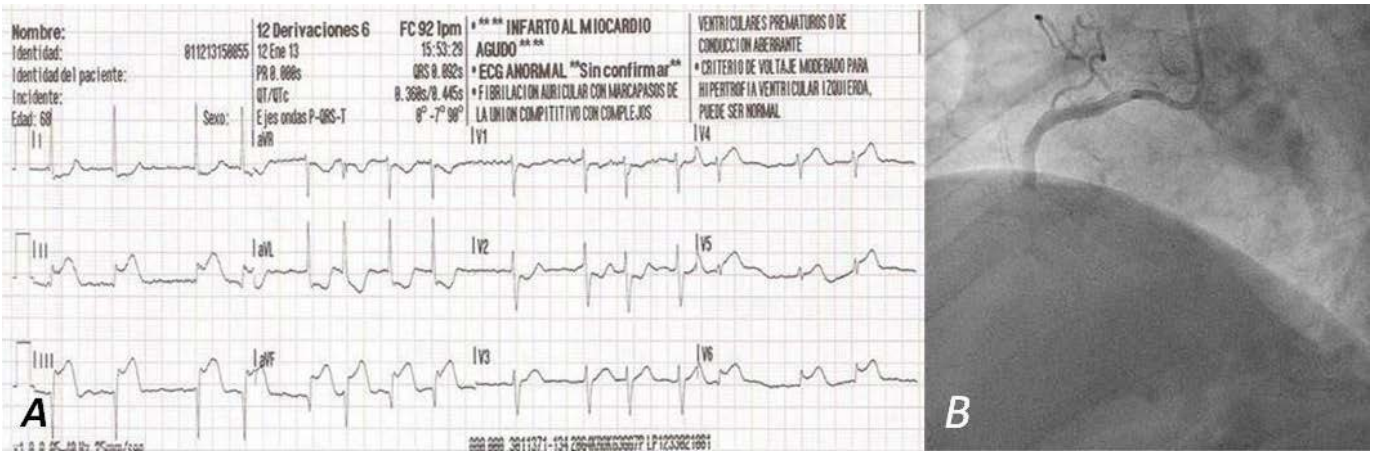

Figure 1. A. Electrocardiogram showing AF and subepicardial lesion indicating inferolateral AMI. **B.** Right coronary artery with acute atherothrombotic occlusion at mid segment, with TIMI 0 flow.

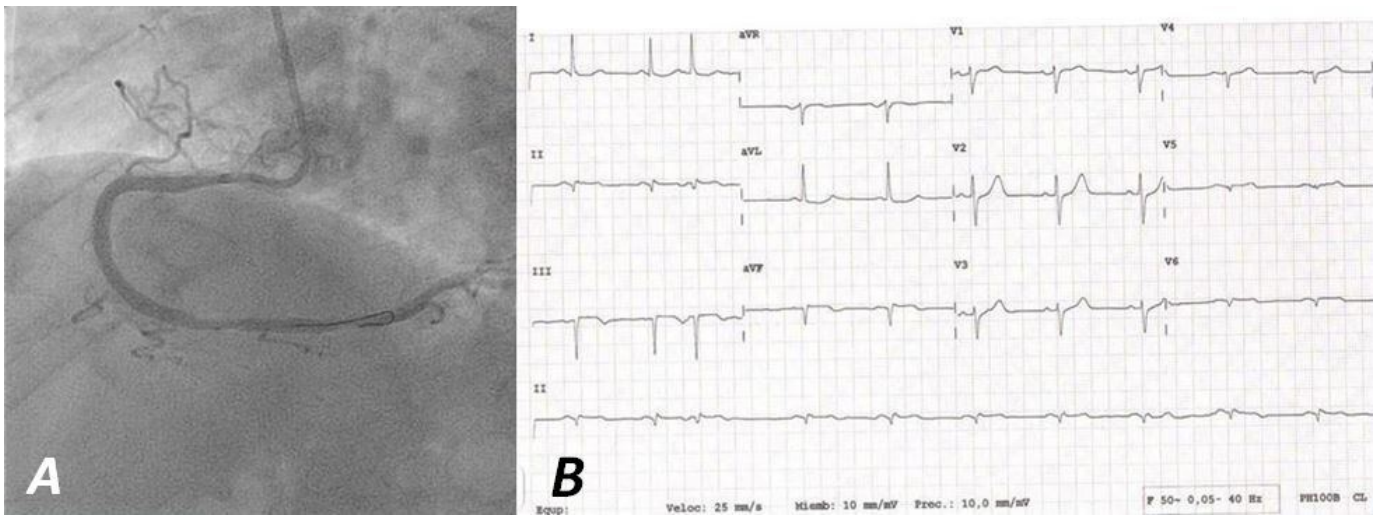

Figure 2. A. Right coronary artery after coronary intervention with TIMI 3 flow. **B.** Immediate electrocardiogram (PCI room) with resolution of subepicardial injury and recovery of sinus rhythm.

(PCI) is residual, as most of the patients were reperfused with fibrinolysis or did not even received it[1]. Therefore, the results should be analyzed cautiously, within the current trend toward early treatment of myocardial infarction with PCI. In fact, Kinjo *et al.*[2] described, in a series of 2475 patients treated with PCI, how after appropriate statistical adjustment for these variables the mortality of patients with and without AF in the peri-AMI period did not differ.

Reference to a purely ischemic AF, that is, the presence of arrhythmia only during acute ischemia, and its immediate disappearance after effective revascularization, is anecdotal and very difficult to find in the literature and in published series[3]. One mechanism that could predispose patients to the arrhythmia during AMI would be an increase in the left ventricular end-diastolic pressure due to diastolic dysfunction (or systolic dysfunction) and the consequent increase in left atrial pressure; although it has been described in animal models how selective ischemia of atrial tissue leads to an electrophysiological remodeling that predisposes patients to fibrillation due to an increase in the excitability threshold, a reduction of the conduction velocity and a dispersion of the refractory period with a consequent fragmentation of the wave front which contributes to the appearance of reentry around ischemic tissue[4].

In most studies, AF has been associated with left anterior descending coronary artery disease, possibly due to the potentially greater hemodynamic impact caused by the involvement of the underlying myocardium, without any statistical adjustment with respect to this confirming it. On the other hand, Mendes *et al.*[5] demonstrated how the ischemia that depends on the right coronary artery really is an independent predictor of the occurrence of AF.

Regarding the treatment of arrhythmia after its disappearance with a successful early revascularization, it should be noted that the use of beta-blockers and statins, already recommended because of the underlying ischemic heart disease, could be useful as rhythm control strategy. Regarding antithrombotic therapy, clinical practice guidelines indicate no specific recommendations regarding the action to take with these patients, because the evidence is limited and based on non-controlled studies[6].

While in the published studies the stroke risk seems clearly higher in patients with peri-infarction AF, the clinical features of the reported patient differed from those included in these publications (early revascularization with PCI, short-term atrial fibrillation associated only with acute ischemia, preserved systolic function, absence of heart failure). Therefore, in the absence of evidence of clinical benefit, and considering the resulting increased risk of bleeding due to dual antiplatelet therapy, anticoagulation was initially dismissed, and its use was considered if the arrhythmia recurred during clinical follow up.

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