Tricuspid Stenosis after Pacemaker Implantation Without Evidence of Bacterial Endocarditis. A Case Report

Carmen Garrote, María Luisa Fidalgo, Ignacio Iglesias-Garriz, Félix Corral, Jorge Silvestre[a] and Ramón García-Calabozo

Servicio de Cardiología. Hospital de León. León. [a]Servicio de Cirugía Cardiovascular. Hospital de la Paz. Madrid. España.

Tricuspid stenosis related to endocardial pacemaker leads is uncommon. We report the case of a patient with severe tricuspid stenosis documented 15 years after the implantation of a permanent DDD pacemaker for symptomatic congenital heart block. The atrial and ventricular leads both had a loop at the level of the tricuspid valve that may have caused endothelial damage and, eventually, tricuspid stenosis.

Key words: *Pacemaker. Tricuspid stenosis.*

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Estenosis tricúspide tras la implantación de marcapasos intracavitario sin evidencia de endocarditis. A propósito de un caso

La estenosis tricúspide relacionada con la presencia de un electrodo de marcapasos es poco frecuente. Describimos el caso de una paciente que presentaba una estenosis tricúspide severa diagnosticada 15 años tras implantarse un marcapasos intracavitario DDD. Ambos electrodos auricular y ventricular presentaban un bucle que se apoyaba sobre el plano valvular tricúspide.

Palabras clave: *Marcapasos. Estenosis tricúspide.*

INTRODUCTION

Isolated tricuspid stenosis is an infrequent pathology. Various cases of tricuspid stenosis have been reported after the implantation of an intracavitary pacemaker,[1] in some cases associated with an infectious process (endocarditis) and in others with a mechanical effect.

CLINICAL CASE

A 42-year-old woman diagnosed as symptomatic congenital third-degree atrioventricular block underwent implantation of a DDD pacemaker in 1986. In July 1991 she consulted for inflammation of the pacemaker pouch, with no signs of infection, so the generator was changed and implanted deeper. In February 1996, she consulted for dizziness and bradycardia, and a resistance of 130 ohms was registered in the ventricular electrode. The old generator was removed and a new VDD pacemaker was implanted in the right subclavian, leaving the two old electrodes in the pouch (Figures 1A and B).

In March 2001 she consulted for dyspnea with mild effort and chest pain. She presented jugular ingurgitation and auscultation detected an opening click and II/VI diastolic murmur in the tricuspid focus.

The echocardiogram (Figures 2A and B) revealed a tricuspid valve with thickened leaflets and adherence of the ventricular electrode to the septal leaflet producing severe stenosis (mean gradient of 9.9 mm Hg, area 1 cm^2), and the atrial electrode adhered to the tricuspid valve plane. An exercise stress test was carried out, which had to be interrupted at the end of the third phase. The decision was made to administer medical treatment.

DISCUSSION

The development of tricuspid stenosis in pacemaker carriers is uncommon. Two possible mechanisms have been suggested: infectious (endocarditis) and mechanical, as a result of the endothelial lesion that the electrode produces in the valve. Various authors[1-3] have reported that stenosis can occur as a result of leaflet perforation or the mechanical effect of the electrode loop against the valve. This was later confirmed in an

Correspondence: Dra. C. Garrote Coloma.
Servicio de Cardiología. Hospital de León.
C/ Altos de Nava, s/n. 24071 León. España.
E-mail: cgarrote@hleo.insalud.es

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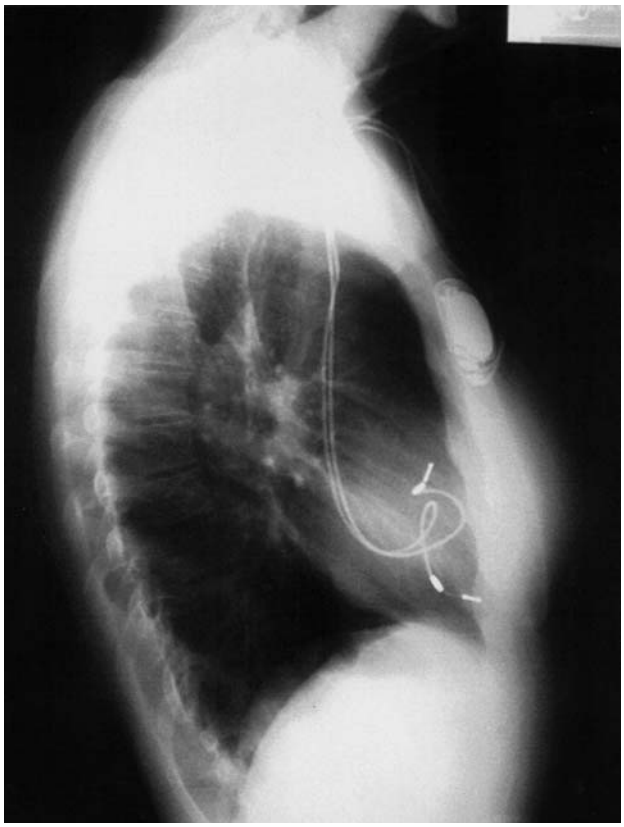

Fig. 1A. Lateral chest radiograph one year after implantation of the first pacemaker. Observe the loop formed by the atrial and ventricular electrodes on the tricuspid plane.

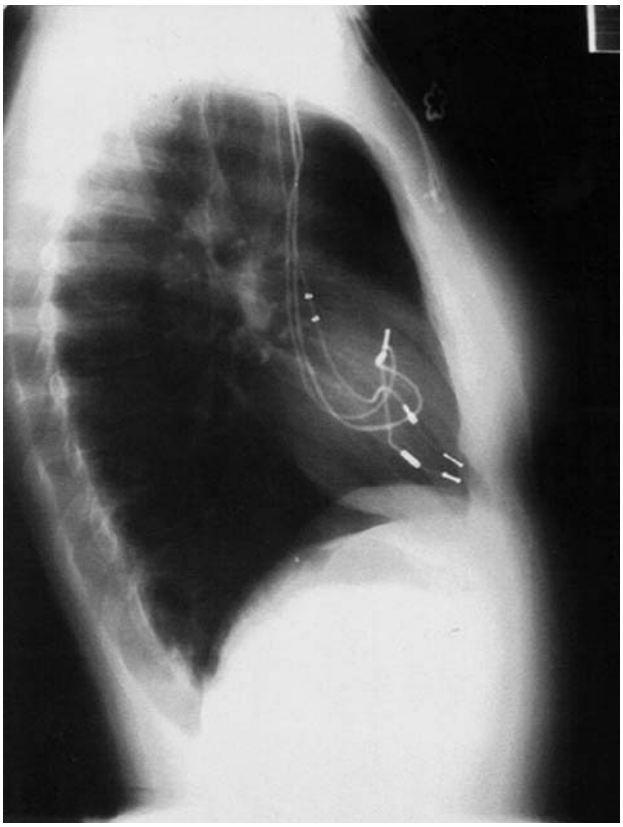

Fig. 1B. Lateral chest radiograph after implantation of the new system.

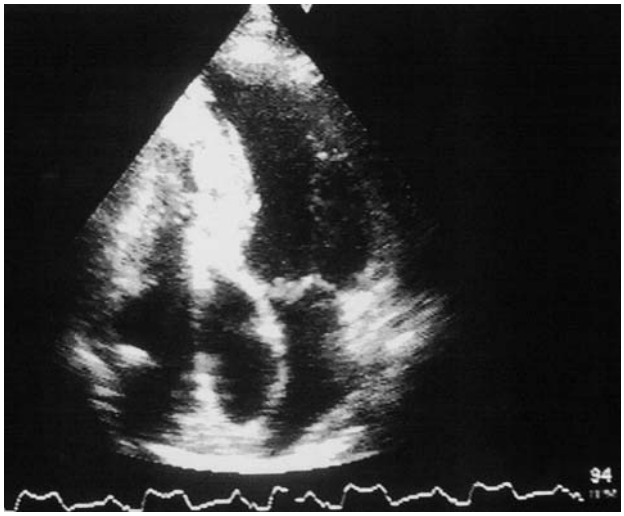

Fig. 2A. 2D echocardiogram, 4-chamber view. Right atrial dilatation and valvular thickening are observed.

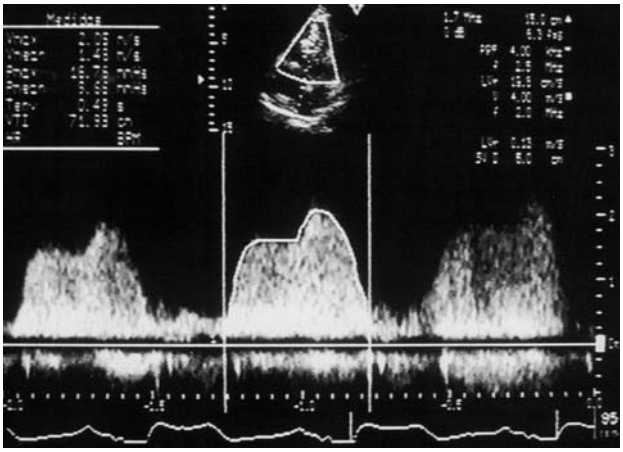

Fig. 2B. Doppler ultrasound of the tricuspid valve with a mean gradient of 9.9 mm Hg.

anatomopathological study of 8 hearts after the implantation of an automatic defibrillator.[4]

Four cases of tricuspid stenosis associated with right-side endocarditis have been reported in the literature.[5-8] Endocarditis related with the pacemaker electrode can persist subclinically for a long time despite antibiotic treatment, and there is consensus regarding the need to remove foreign bodies, even when medical treatment initially seems effective.[9,10]

In this case (Figure 1A) both the atrial and ventricular electrodes form a loop on the plane of the triscuspid valve and can trigger stenosis, since findings of

endocarditis never existed. As López-Gil et al[11] indicate, adequate proximal fixation of the electrode can prevent the formation of loops, and early correction can avoid damage to the tricuspid valve. Medical treatment was indicated since there were no finding of endocarditis and the patient had an excellent functional class. It is important to note that the appearance of clinical manifestations suggestive of right heart failure in any patient with a pacemaker should suggest the possibility of tricuspid stenosis. Any redundant intracavitary electrode that presents a loop in the tricuspid valve, or shows signs of infection (in some cases the loop itself may predispose to infection), can give rise to tricuspid stenosis.

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