

## Right-sided infective endocarditis with pulmonary thromboembolism in a patient with end-stage renal failure

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### ARTICLE INFORMATION

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### Competing interests

The authors declare no competing interests

### Acronyms

**CKD:** chronic kidney disease

**IE:** infective endocarditis

### ABSTRACT

*Right-sided infective endocarditis is a serious issue to be addressed due to its different forms of presentation and, above all, to the use of greater and better medical procedures that require central venous accesses. Such procedures are important and effective, but constitute a risk factor at the same time; leading to cardiac events with their harmful effects that threaten the patient's life. Bacterial resistance to treatment and their appearance in immunosuppressed patients are factors that worsen prognosis. We report the case of a 28-year-old man with a history of end-stage renal failure presenting right-sided infective endocarditis with pulmonary thromboembolism.*

**Keywords:** Infective endocarditis, Chronic kidney disease, Cardiogenic embolism

### ***Endocarditis infecciosa de corazón derecho con troboembolismo pulmonar en paciente con insuficiencia renal terminal***


### RESUMEN

La endocarditis infecciosa de corazón derecho es un importante problema a enfrentar debido a sus variadas formas de presentación y, sobre todo, al uso de mayores y mejores procedimientos médicos que requieren de accesos venosos centrales; los cuales, a pesar de ser muy importantes y eficaces, representan un factor de riesgo a padecer esta enfermedad que puede ocasionar fenómenos cardiembólicos con sus efectos deletéreos que ponen en peligro la vida del paciente. La resistencia de los gérmenes al tratamiento y su aparición en pacientes inmunodeprimidos son factores que empeoran el pronóstico. Se presenta el caso de un hombre de 28 años de edad, con endocarditis de corazón derecho e insuficiencia renal terminal.

**Palabras clave:** Endocarditis infecciosa, Insuficiencia renal crónica, Embolismo cardiogénico

### INTRODUCTION

The classic clinical presentation of the infective endocarditis (IE) has varied over the past 50 years, because most of the patients receive incomplete or partial antibiotic treatment contributing to delay the diagnosis<sup>1-3</sup>. Currently, fever, recurrent bacteremia, heart failure and systemic embolization

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are the most common manifestations of peripheral hypersensitivity, splenomegaly and appearance of a new murmur of valvular failure<sup>3-5</sup>. Nevertheless, the presence of fever, cardiac murmur and positive blood culture grant a high suspicion to this disease.

The right heart IE mainly involves the tricuspid valve, the pulmonary location is rare, and it is frequently caused by yeast, pseudomonas and other negative gram bacteria previously unusual; which, by location and type of germ, differ from streptococcal or staphylococcal endocardial infections<sup>5,6</sup>. The use of intravenous drugs and prolonged venous catheterization are important risk factors<sup>7</sup>.

The diagnosis of right IE will have a high index of suspicion in patients using intravenous drugs or who need prolonged placement of venous catheters, present fever and pulmonary infiltrates detected on the chest radiography. Pneumonia or pulmonary embolism may present in 70-100% of the cases and a murmur of tricuspid regurgitation is frequent; in addition, up to 20% of patients may have negative cultures<sup>5-7</sup>.

## CASE REPORT

Here is presented the case of a 28-year-old Caucasian man, 41 kg, with a history of chronic kidney disease (CKD) since the first months of life (severe congenital bilateral renal atrophy), which was in end-stage and received a kidney transplant from a living donor (sister), that complicated by a thrombosis of the implanted kidney and triggered the failure of the transplant; hence, he rejoined the hemodialysis program (for venous catheter), waiting for a new transplant.

After one of the programmed hemodialysis, the patient presented fever of 38°C and chills, thus he was admitted at the hospital for study and treatment; the central venous catheter was removed and blood cultures were indicated.

### Physical examination

Moist and hypopigmented mucous membranes. Vesicular murmur diminished, without rattles. Rhythmic heart sounds, with systolic murmur II/VI in low left sternal border and positive Rivero Carballo maneuver (increase in intensity during inspiration). Heart rate of 108 beats per minute and blood pressure of 200/110 mmHg. The funduscopy was normal and the assessment of radiocephalic and brachiocephalic arteriovenous fistulas of the left arm showed

the possibility of access for the next hemodialysis and treatment administration.

After taking several samples for blood culture, the antibiotic treatment (cephalosporins and aminoglycosides) was started with dose adjustment for CKD; but 48 hours after admission, the patient still had fever with severe chills and poor general condition.

### Evolution

During the evolution, he presented persistent cough, difficult to control, accompanied by severe pain in the chest and back, which described "like being stubbed", and abundant expectoration with red blood, shining, dyspnea, orthopnea, cyanosis, profuse sweating, extreme anxiety and a sense of impending death; as well as hepatomegaly, jugular engorgement and edema in lower limbs. In addition, hemodynamic instability with arterial hypotension, tachycardia of 184 beats per minute, peripheral hypoxaturation of oxygen and respiratory distress; by all which the endotracheal intubation and mechanical artificial ventilation were the decisions made at the moment.

The chest radiography (**Figure 1A**) showed images compatible with a pulmonary infarction and the transthoracic echocardiogram (**Figure 1B**) showed the presence of an intracardiac mass (in the right ventricle), in relation to the tricuspid valve, compatible with endocardial vegetation.

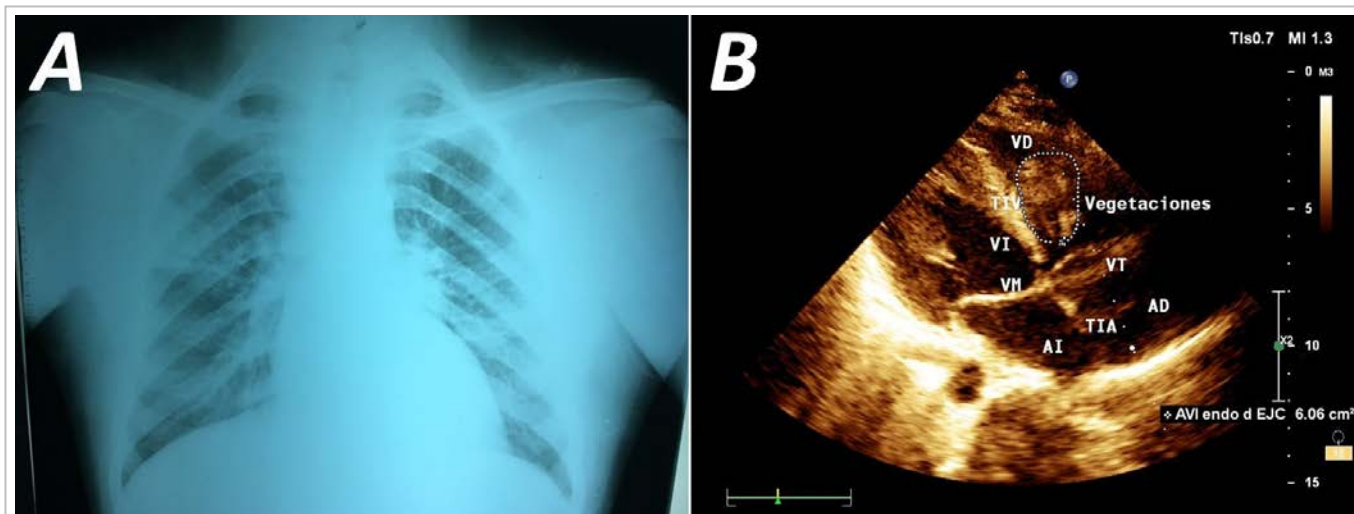
In the serial blood cultures grew a multi-resistant golden staphylococcus, which finally responded to the antibiotic treatment combined with vancomycin, aztreonam and tobramycin.

The state of extreme severity of the patient was improved, mechanical ventilation was removed, the presence of other germs discarded, especially fungi, due to the size of vegetation, the blood cultures were negativized and, after 23 days with the antibiotic treatment, radiological improvement was found (**Figure 2A**) and disappearance of the vegetation (**Figure 2B**).

The antibiotic treatment was maintained for six weeks and the access for the hemodialysis fistulas was reassumed.

### COMMENT

The patient presented had a severe pulmonary thromboembolism from an infective endocarditis of the right heart, stimulated by the central venous

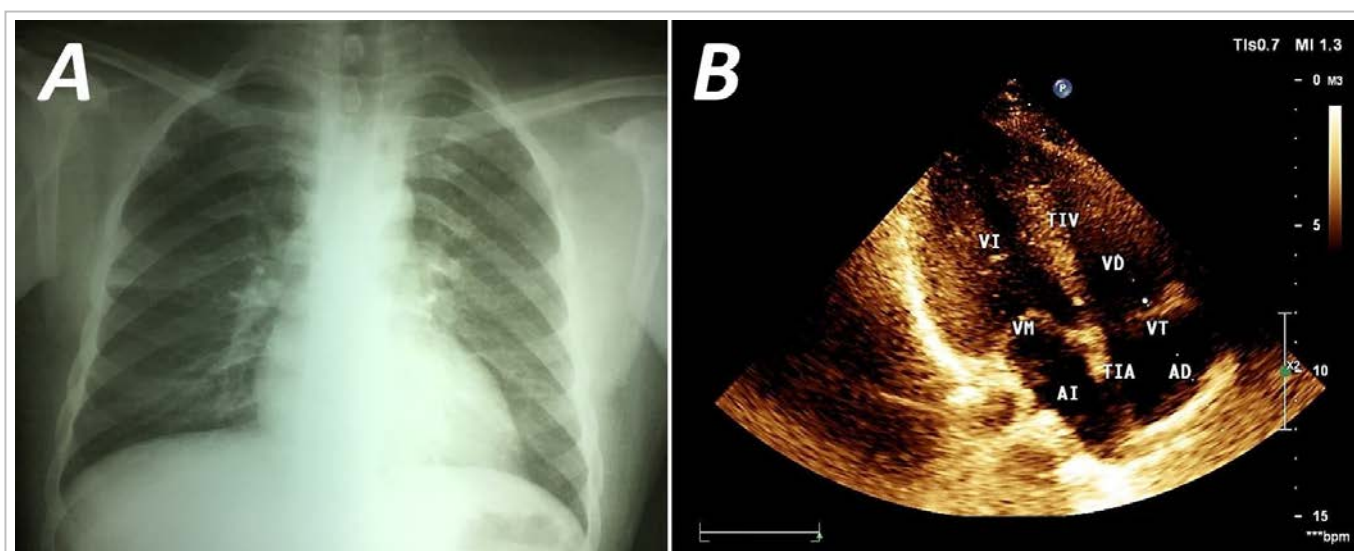


**Figure 1.** **A.** Posteroanterior chest radiography showing multiple lesions produced by embolic phenomena (possible right pulmonary infarction) due to right heart vegetation. **B.** Echodense image that suggests vegetation in the right ventricular, attached to the tricuspid valve, and severe tricuspid regurgitation. Acronyms in Spanish: *AD*, right atrium; *AI*, left atrium; *TIA*, interatrial septum; *TIV*, interventricular septum; *VD*, right ventricle; *Vegetaciones*; vegetations; *VI*, left ventricle; *VM*, mitral valve; *VT*, tricuspid valve.

catheter for hemodialysis, which was used considering that after transplantation, the functionality of arteriovenous fistulas of the upper left member had been lost. The large vegetation is explained for being a patient with immunodeficiency due to the CKD, which favored the proliferation of germ that usually

produces large vegetation, as fungi do it<sup>8</sup>.

In all patients with terminal CKD, dependent on hemodialysis through central venous catheter, the appearance fever should be paid special attention, because intravascular catheters are risk factors for the entry of germs that can colonize the endocardial



**Figure 2.** **A.** Posteroanterior chest radiography and **B.** Transthoracic echocardiogram showing improvement of the radiographic lesions and disappearance of intracardiac mass, after specific antibiotic treatment. Acronyms in Spanish: *AD*, right atrium; *AI*, left atrium; *TIA*, interatrial septum; *TIV*, interventricular septum; *VD*, right ventricle; *VI*, left ventricle; *VM*, mitral valve; *VT*, tricuspid valve.

surface and cause serious complications, endangering life<sup>8,9</sup>.

These devices favor IE of the right cardiac structures, which is a frequent cause of thromboembolism and pulmonary infarction, with the possibility of producing hemoptysis<sup>10</sup>. Marom *et al*<sup>11</sup> found IE in 76% of patients with central venous catheter. The involvement of the pulmonary valve ranges from 1.7-2.0%<sup>6</sup>, and it is more frequent in intravenously drug addiction and in patients with congenital heart disease<sup>10-13</sup>. When it affects a healthy heart, the most frequent microorganism is the golden staphylococcus; however, in underlying structural diseases is the viridians streptococcus<sup>5,13</sup>.

The blood cultures with antimicrobial susceptibility testing are essential for accurate diagnosis and treatment of IE, and the echocardiography remains a sensitive technique for detecting vegetation, although the transesophageal mode has the greatest value<sup>13,14</sup>. The intravenous antibiotics in these patients should be for six weeks<sup>1,13</sup>, and in the immunosuppressed ones must provide the possible presence of opportunistic pathogens which may be difficult to identify with the usual culture means<sup>15</sup>. The discovery of new and better antimicrobials has improved the prognosis of these patients, but pharmacological treatment is not always enough, hence, there are precise indications for surgery<sup>1,13,16</sup>.

Several authors have suggested that the presence of fever, heart murmur, positive blood cultures, evidence of pulmonary embolism, septic and absence of systemic embolism, next to the echocardiographic demonstration images compatible with vegetation on the pulmonary valve or tricuspid raise the sensitivity and specificity of the right IE's diagnosis<sup>1,7,10-12,17</sup>.

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