

Infective Endocarditis by Uncommon Microorganism – *Klebsiella oxytoca* – in Right Heart Chambers

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Introduction

Young patient, crack addict, with picture of dyspnea, presented significant tricuspid valve insufficiency and right ventricular failure, developed infective endocarditis by uncommon microorganism and, subsequently, death.

Case Report

Male patient, 29 years old, stylist and crack addict, admitted to a tertiary hospital owing to edema of the lower limbs, increase of the abdominal volume, chest pain from weight and dyspnea which started four months ago with gradual worsening. There was no change of the markers of myocardial lesion. The patient was being followed up by a general practitioner in his city, he was using furosemide and presented previous history of upper digestive hemorrhage (but could not precisely indicate the date), cirrhosis and anemia due to iron deficiency. He was admitted to the emergency hospital without fever, pale (3+/4), icteric, dyspneic, presenting weight loss and hemodynamically stable.

In admission, the following was requested: chest radiograph, showing signs of pulmonary congestion (Figure 1), chest angiotomography and transthoracic echocardiography. The angiotomography was compatible with Chronic Thromboembolic Pulmonary (Figure 2) and the transthoracic echocardiography showed a significant right ventricle failure, significant swelling of the right chambers, significant tricuspid valve insufficiency and systolic pressure of the pulmonary artery of 112 mmHg (Video 1*, Figure 3).

After five days of admission, the patient presented fever, arterial hypotension, anuria and worsening of dyspnea, being installed a central venous access. He developed shock and acute kidney failure, needing intubation, hemodialysis and use of vasoactive drugs.

An antibiotic therapy was administered with Piperacillin and Tazobactam for Urinary Tract Infection after isolation of *Klebsiella oxytoca* in hemocultures and uroculture. There was no response to treatment, and fever persisted.

Keywords

Endocarditis, bacterial; *Klebsiella oxytoca*; Drugs.

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* Videos at the end of the article.

A new echocardiography was requested and performed nine days after the first test, showing a thickened tricuspid valve, a significant regurgitation and multiple filamentary mobile images, being the larger 3.1cm long, with right ventricular protrusion during diastole, compatible with vegetations. (Videos 2, 3 and 4*; Figure 4).

Antibiotic therapy changed to Meropenem and Vancomicina, with no favorable response for the treatment administered.

The patient developed with hemodynamic worsening, with no signs of reversal of the shock, with death 14 days after admission.

Discussion

Infective endocarditis is defined as an infection located anywhere in the endocardium. Yearly, the incidence of infective endocarditis is four to ten in each 100,000 people, slightly predominant in the male gender. Mortality, regardless of the sophisticated diagnostic media, is elevated: one in 100,000 annually^{1,2}.

When it affects the tricuspid valve, endocarditis is more commonly found in patient addicted to intravenous drugs or associated to a central venous catheter over a prolonged time, and may be connected to several pathologies, such as alcoholism, immune suppression and congenital heart diseases^{3, 4}. The incidence of endocarditis in right heart chambers ranges between 5 to 10%^{5, 6}.

The risk of endocarditis in drug addicts is 2 to 5% per patient per year⁷, many times higher than that estimated for patients with rheumatic heart disease or prosthetic valves. From 65 to 80% of the cases⁸, it happens to men, and the average age ranges from 27 to 37 years old. Polymicrobial endocarditis and uncommon micro-organism endocarditis, probably connected to the injection of contaminated material happens more frequently to these patients.

In the case presented, the patient presented chronic pulmonary thromboembolism and was admitted with signs of infection.

Only after admission did he present fever, anuria, hemodynamic instability and shock. There was the hypothesis of septic shock, finding positive hemoculture and a new finding in the transthoracic echocardiography. Therefore, the infective picture may be concluded to be onset inside the hospital and not associated with the use of intravenous drugs. Intrahospital endocarditis comprises from 5 to 29% of all of the cases of infective endocarditis⁹. Infected intravascular devices and catheters caused 45 to 65% of bacteremias which result in this pathology. Out of this group, 5 to 7%¹⁰ were found in the right heart chambers of patients with central venous catheters,

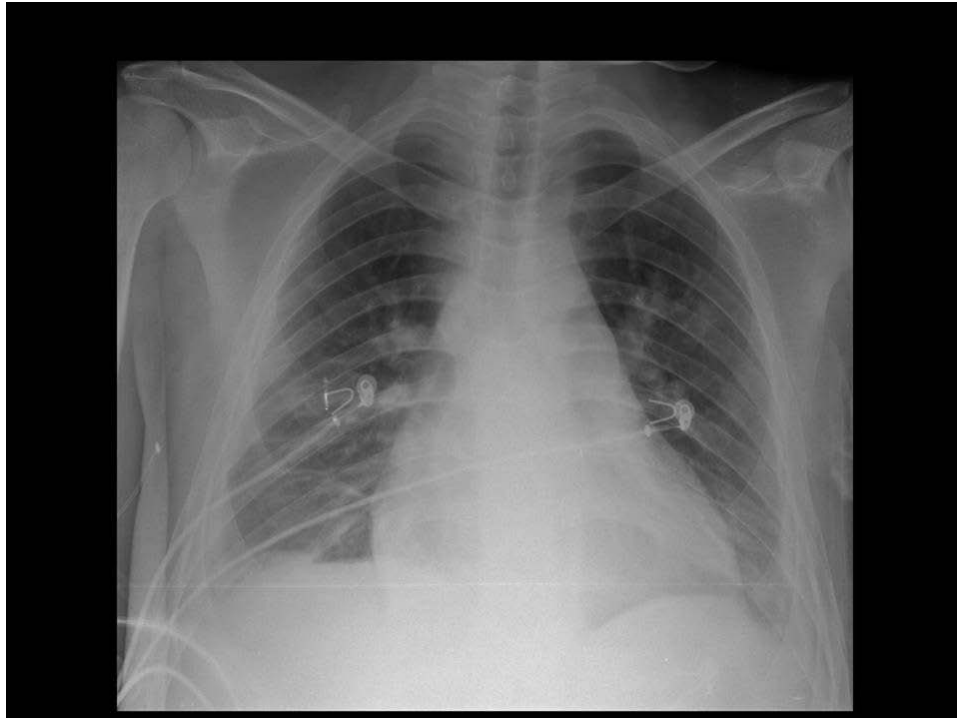


Figure 1 – Chest radiography with signs indicating pulmonary congestion.

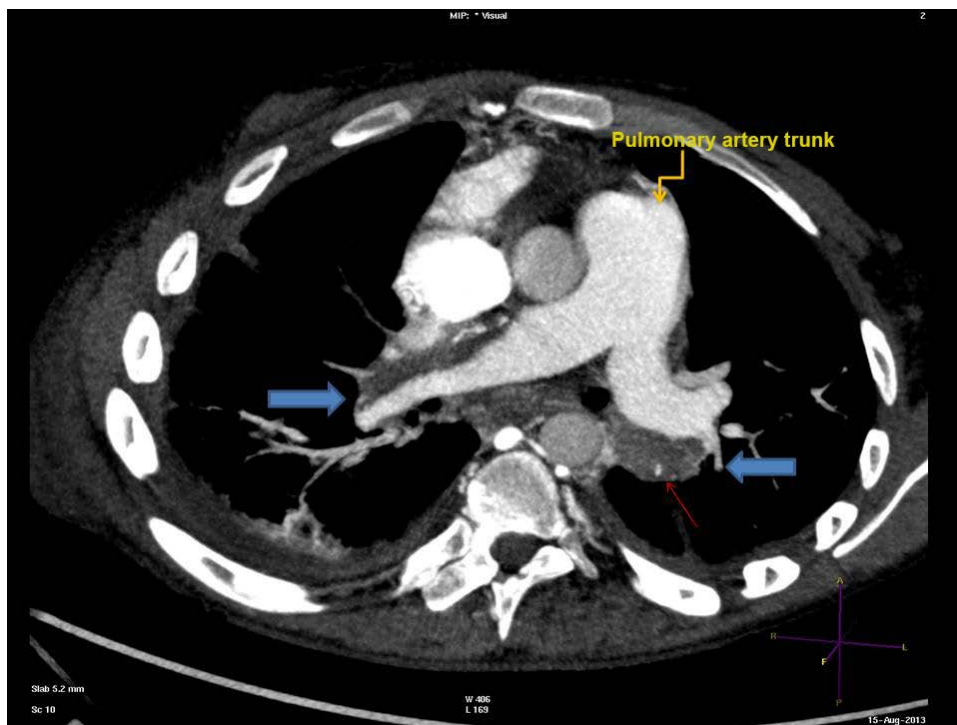


Figure 2 – Chest angiotomography (cross-section) with contrast showing eccentric mural thrombus (arrows in blue) with small calcifications inside (red arrow) in the right and left pulmonary arteries. These findings are compatible with chronic pulmonary thromboembolism.

Case Report



Figure 3 – Transthoracic echocardiography. Short axis incidence. Maximum gradient estimated by the tricuspid valve regurgitation of 92 mmHg, added to 20 mmHg (evaluation of diameter and respiratory anomaly of inferior vena cava), resulting in a systolic pressure of pulmonary artery of 112 mmHg.



Figure 4 – Short axis incidence. Multiple filamentary images in the tricuspid valve, being the larger 3.1cm long, with right ventricular protrusion compatible with vegetations.

as well as patients using pulmonary artery catheters. Gram-positive cocci are the predominant cause of intrahospitalar infective endocarditis.

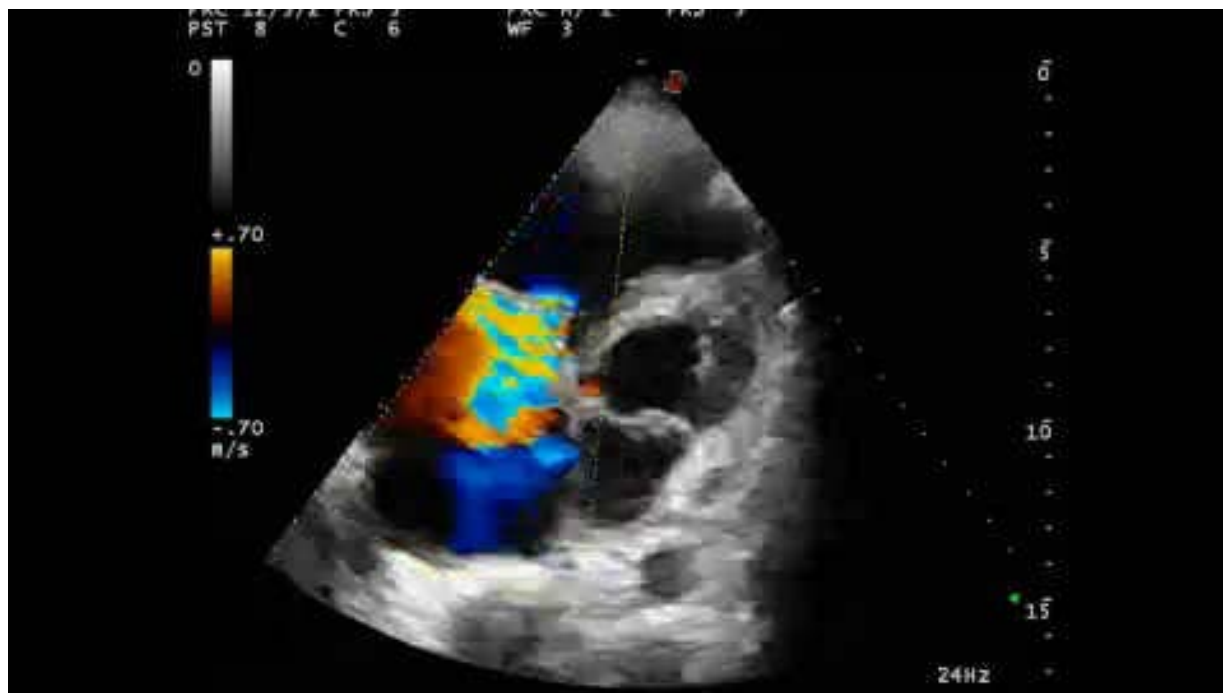
In this case, the infectious agent isolated in the hemocultures was *Klebsiella oxytoca*. *Klebsiella* spp. is an atypical agent of infective endocarditis, reaching in a series < 1.2% of the native valves and 4.1% in prosthetic valves¹¹. The most common triggering agent is *K. pneumoniae*, which presented only four cases of infection by *K. oxytoca*¹². *Klebsiella oxytoca* (or only *oxytoca*) is a type of bacteria of the *Klebsiella* family which is rather

similar to *Klebsiella pneumoniae*. This type of bacteria is typically found in intestines and it is necessary for the regular operation of this organ, mostly causing urinary infection or biliopancreatic infection. It is the agent of intrahospitalar infections which mostly impact patients with immune suppression or under intensive care¹³. *K. oxytoca* represents 0.5-0.6% of that isolated in bacteremia, more than one third is polymicrobial infections and around 37-52% is nosocomial. The infective endocarditis by this agent is extremely rare and presents an elevated mortality (49%), regardless of the proper antibiotic therapy¹⁴.

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Case Report



Video 1 – Transthoracic Echocardiography (parasternal short axis view) with significant tricuspid valve insufficiency, correction of interventricular septum and swelling of the right heart chambers. The pulmonary systolic pressure was estimated in 112mmHg.



Video 2 – Transthoracic Echocardiography (paraesternal short axis view) showing correction of interventricular septum.



Video 3 – Transthoracic Echocardiography (paraesternal short axis view) showing multiple filamentary images in the tricuspid valve, being the larger 3.1cm long, compatible with vegetations.



Video 4 – Transthoracic Echocardiography, zoom in the entry of the right ventricle, showing images of vegetations in the tricuspid valve.