CorSalud 2012 Jul-Sep;4(3):216-220

CorSalud

Cuban Society of Cardiology

Case Report

Cardiocentro Ernesto Che Guevara Santa Clara Cuba

GIANT THROMBUS IN RIGHT ATRIUM AS A CAUSE OF ANGINA AND SYNCOPE

TROMBO GIGANTE EN AURÍCULA DERECHA COMO CAUSA DE ANGINA Y SÍNCOPE

Yuri Medrano Plana[1], MD, MSc; Roger Mirabal Rodríguez[2], MD, MSc; Jean L. Chao García[1], MD, MSc; Roberto Bermúdez Yera[3], MD; Mario E. Nápoles Lizano[3], MD; and José L. Aparicio Suárez[4], MD, MSc

1. First Degree Specialist in Cardiovascular Surgery. Master in Medical Emergencies.
2. Second Degree Specialist in Cardiovascular Surgery. Master in Medical Emergencies. Associate Professor.
3. First Degree Specialist in Cardiology.
4. Second Degree Specialist in Hematology. Master in Medical Emergencies. Associate Professor.

Cardiocentro "Ernesto Che Guevara". Villa Clara, Cuba.

Received: March 12, 2012
Accepted for publication April 19, 2012

Este artículo también está disponible en Español

ABSTRACT

Intracardiac tumors are rare, and may be of neoplastic and non-neoplastic types. In the latter, the thrombi are the most frequent masses. This is the case of a young patient operated at the Cardiocentro "Ernesto Che Guevara" of Villa Clara, Cuba, with a history of blood disorders since childhood, starting with episodes of progressive dyspnea, angina and syncope, with pre-operative diagnosis of giant tumor in right atrium which turned out to be an intracardiac thrombus, and the presence of a patent foramen ovale was shown.

Key words: Thoracic surgery, thrombosis, patent foramen ovale

RESUMEN

Las tumoraciones intracardíacas son poco frecuentes, y pueden ser de tipo neoplásicas y no neoplásicas. De estas últimas, los trombos, constituyen las masas más frecuentes. Se presenta un paciente joven, operado en el Cardiocentro "Ernesto Che Guevara" de Villa Clara, Cuba, con antecedentes de trastornos hematológicos desde la infancia, que comienza con episodios de disnea progresiva, angina y síncope; con diagnóstico preoperatorio de tumoración gigante en aurícula derecha que resultó ser un trombo intracardíaco, y se demostró la presencia de un agujero oval permeable.

Palabras clave: Cirugía torácica, trombosis, foramen oval permeable

INTRODUCTION

The intracardiac tumors can be divided into two groups: neoplastic and non-neoplastic. Non-neoplastic lesions are represented by the thrombi (which are the most common intracavitary masses), endocarditis vegetations and embryological remnants, among others[1-3].

Thrombi located in the right heart chambers come more often from the peripheral venous circulation but to a lesser extent, they can also originate *in situ*[4,5].

There are thrombogenic diseases that can also be

✉ *Y Medrano Plana*
Carretera a Camajuaní. Rpto Técnicos del MICONS Nº 12
Santa Clara. CP 50300.
Villa Clara, Cuba.
Correo electrónico: medrano@capiro.vcl.sld.cu

related to the occurrence of these, such as the primary antiphospholipidic syndrome and other autoimmune diseases that are present with recurrent thrombotic events[6].

There is little knowledge of thrombus incidence in right chambers as echocardiographic studies are usually only performed in those patients with severe hemodynamic compromise, or in those with suspected cardiac anatomic abnormalities[5,7].

This is the case of a young patient who underwent surgery at the Cardiocentro "Ernesto Che Guevara" in Villa Clara, Cuba, with a history of blood disorders since childhood, starting with episodes of progressive dyspnea, angina and syncope, with preoperative diagnosis of giant tumor in right atrium which turned out to be an intracardiac thrombus, and the presence of a patent foramen ovale was shown.

CASE REPORT

The patient is a 45 year-old white male with a history of rheumatoid arthritis and "platelet disorders" since childhood who also presented bronchial asthma and hypertension which were controlled with medical treatment.

Ten years before the current admission he suffered a deep venous thrombosis of the right leg, which resolved with medical treatment.

This time, four months before admission, he suffered from progressive dyspnea episodes, associated with chest pain and an episode of syncope, which made him go to his health area. He was assessed and the hematologic studies showed normal results. An interconsultation with cardiology was decided. In transesophageal echocardiography (TEE) a tumural image of about 5x5 cm was shown, which occupied the right atrium (RA) and seemed to be pedicled to the interatrial *septum*, which was visualized patent right-to-left shunting. This image made contact with the tricuspid valve and caused failure.

With these results the patient was hospitalized with a diagnosis of intracardiac tumor (myxoma of RA) in the cardiology department of the health center of his health area. The patient continued to be studied and interconsultations with different medical specialties were conducted.

Hematology: Patient with a history of immune thrombocytopenia in childhood, who presented moderate thrombocytopenia with consumptive coagulopathy in the studies performed by special hematology during admission. In medullogram a reactive marrow with hyperplasia of the megacaryopoietic series was noticed, and it was interpreted as a patient with bleeding disorders as a result of a paraneoplastic event.

Multislice CT was performed (Figure 1), which reports: intracardiac mass in RA of 4x6 centimeters, covering almost two-thirds of it, attached to the interatrial septum and protruded into the right ventricle (RV) through the tricuspid valve, which seemed to be affected and perforated. In addition, a patent foramen ovale seemed to be present.

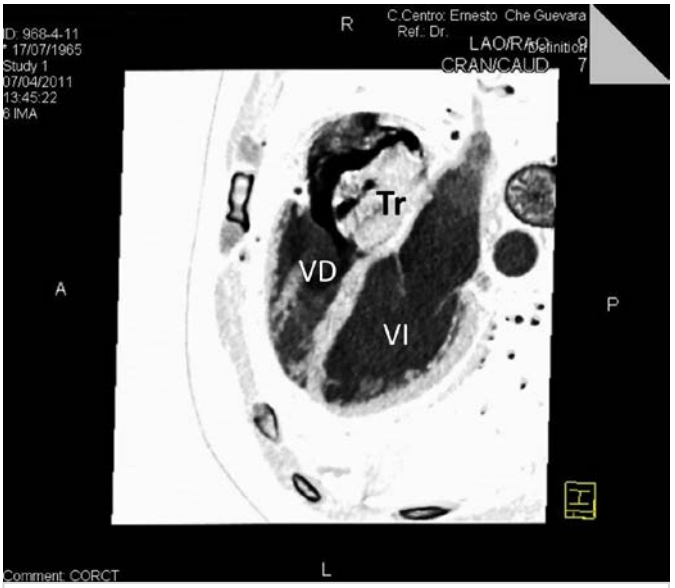

Figure 1. Multislice CT showing the mass within the right atrium. Tr: thrombus, VD, right ventricle (acronim in spanish), VI: left ventricle (acronim in spanish).

Cardiovascular Surgery: After evaluating the results of the studies performed and the consultations, it was decided to transfer the patient to our center for surgical treatment, as a relative urgency.

The patient underwent surgery and an excision of the tumor located in the RA was performed under extracorporeal circulation. Anoxic arrest time was 59 minutes and extracorporeal circulation, 76 minutes. During surgery, a tumoral mass of about eight centimeters in diameter was found in the RA, which was attached (without pedicle) to the interatrial septum and to the atrial endocardium. It was reddish, rough-edged and with invasive areas of bleeding which seemed to be an old thrombus. Attempts were made to liberate it for complete removal, but it could not be achieved due to its consistency and size, so it was carefully extracted in fragments (Figure 2), with no residual tumor left in the cavity. There were no abnormalities of the tricuspid valve, so it was not acted on it and the diagnosis of

patent foramen ovale was confirmed, which is closed with 4/0 Assupro suture threads with double Teflon cork.

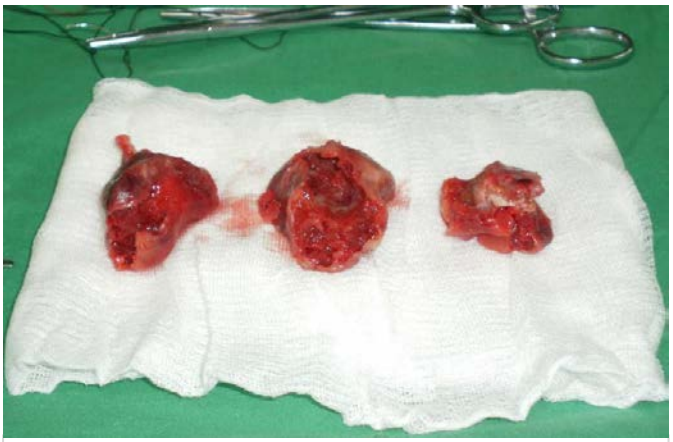

Figure 2. Surgical specimen taken from the right atrium (fragmented thrombus).

The patient was extubated before 12 hours after surgery, and evolved satisfactorily. He was discharged after 10 days of surgery and currently, after one year follow up along with hematology, he is stable with functional class I of the New York Heart Association (NYHA).

DISCUSSION

One of the common causes of syncope are embolic events of cardiac origin. The causes of these may be multiple (atrial fibrillation, prosthetic valves, infective endocarditis, intracardiac thrombi and atrial myxoma, etc.).

In our case, this is a patient with a history of blood disorders since childhood and lower limb venous thrombosis a few years earlier, which may have been the cause of origin or increase of the large thrombus located in the RA, responsible for the cardiovascular manifestations the patient presented for months before admission.

At the time of surgery, the thrombus showed invasive and bloody areas on its surface, which could cause the release of thrombotic material that at some point, due to increased pressures in the right chambers, may have passed to the left circulation through the patent foramen ovale which caused syncope as a product of a paradoxical embolism.

The first description of a paradoxical embolism was performed by Cohnheim in 1877, as stated by Chapel-Montes et al. The term refers to the passing into the arterial circulation of embolic material that is usually a venous thrombus, but it could also be air, septic material or foreign bodies located in the right heart, through a heart defect, usually located in the interatrial septum, but it may also be through ventricular septal defects, or arteriovenous or rare congenital heart malformations, such as Ebstein anomaly[10,11].

The patent foramen ovale is a relatively frequent remnant of fetal circulation, which may be due to multiple causes, the most common is an inadequate fusion of the *septum primum* with the *septum secundum* in the embryonic stage. For many decades, its clinical relevance has not been well elucidated, but it has increased considerably in the presence of echocardiographic techniques, detection during life and the clinical diagnosis of paradoxical embolism, being detected in up to 25-30% of autopsies and accidentally in 5-15% of healthy subjects in whom echocardiography or catheterization is being performed[10,12].

The paradoxical embolism syndrome is a rare disorder and usually originates in the venous circulation, often by fragmentation of a thrombus located in the deep venous system of lower limbs and it could also originate in the right heart chambers. Some authors classify these thrombi into two groups:

- Type A: clots with high mobility, probably originating from a deep vein thrombosis whose characteristics are associated with high mortality (44.7%).
- Type B: those motionless clots, morphologically similar to the thrombus present in left cavities.

The embolus moves to the arterial circulation through an abnormal communication between the right and left chambers. This step is only possible if there is, at some point in the cardiac cycle, a higher pressure gradient in the right chambers to cause a transient reversal of right-to-left shunting, and it may be due to multiple causes such as pulmonary embolism, chronic obstructive lung disease, primary pulmonary hypertension, mechanical ventilation, Valsalva maneuver or a simple cough fit[7,13,14].

As it has been mentioned, echocardiography is the so-called gold technique for diagnosis of intracardiac masses of tumor origin, and it also detects the intracavity thrombi[15]. The sensitivity of TEE for cardiac tumors is greater than that of transthoracic echocardiography, but difficulties for differential diagnosis may come up. However, with the use of contrast and other techniques such as computed tomography (CT scan) and magnetic resonance imaging (MRI) a greater sensitivity can be achieved, since malignant tumors have a rich vascularization to meet the rapid growth of tumor cells. Benign tumors (excluding hemangiomas)

show less vascularization than malignant tumors. Thrombi are generally avascular[16,17].

The TEE has proved superior in the diagnosis of intracardiac masses (especially thrombi) not only in relation to the transthoracic echocardiography, but also against CT and MRI, in the case of small thrombi or those located in the left atrial appendage[4]. Among echocardiographic signs suggesting a greater likelyhood for a thrombus to produce emboli are: greater mobility and bulging inside the ventricle, that it be pedicled, and observation in multiple projections and adjacent areas of akinesia and hyperkinesia[18]. The final confirmation of this situation is very difficult because it requires the detection of a thrombus in right atrial that crosses the defect. However, in clinical practice the diagnosis is usually assumed when it meets Johnson's triad[12]:

a) Systemic arterial embolism without an identifiable source in the left heart or proximal arterial tree.

b) Intracardiac defect with right-to-left shunting at any level.

c) Venous thrombosis with or without pulmonary embolism.

Mortality due to paradoxical embolism syndrome can be high, especially in patients with multiple embolisms, and systemic, pulmonary or neurological damage. In the specific case in which "floating" thrombi with high mobility are found in RA, it is an extreme therapeutic emergency, and any delay in treatment may be lethal, with mortality exceeding 40% regardless of therapy chosen in first 24 hours[5,7,13].

Therapeutic strategies (heparin, thrombolytics or surgery) still remain controversial; however, most works agree to consider it a surgical emergency because of the high early mortality and the risk of fragmentation and systemic embolization, which can occur with the use of fibrinolytic agents[13,19]. The resolution of the stroke, either through medical or surgical treatment should be the initial step.

REFERENCES

1. Lanzas R, Salas D. Eustachian valve mimickingan atrial myxoma. Acta Méd. Costarric. 2005; 47(2):97-9.
2. De la Torre Hernández JM, Mayayo Artal E, Fernández Fernández F. Male with intracardiac mass and heart failure. Rev Esp Patol. 2003;36 (3):339-46.
3. Gutiérrez Jaikel L, Romero Triana L. Recurrent brain embolism, patent foramen ovale and hypercoagulable state. Rev Costarr Cardiol. 2007;9(2): 25-9.
4. Delange Segura L. Limitaciones de la ecocardiografía transesofágica en la valoración de masas intracardiacas. A propósito de un caso. Rev Esp Anestesiol Reanim. 2005;52:421-4.
5. Noval Menéndez J, Rodríguez Redondo L, Nuño Mateo FJ, Campoamor Serrano MT, Arias Miranda I. Varón de 70 años de edad con síncopes de repetición. Rev Clin Esp. 2003;203(9):449-50.
6. Casanovas N, Paré C, Azqueta M, Josa M, Font J, Sanz G. Trombosis intracardíaca y síndrome antifosfolípido primario. Un caso familiar. Rev Esp Cardiol. 2001;54: 1005-9.
7. García Fernández R, Valiente Mustelier J, Cabrera Rego JO, Díaz Padrón R. Trombo en tránsito en aurícula derecha. Rev Fed Arg Cardiol. 2010;39(1):58-60.
8. Sagristá Sauleda J. Abordaje diagnóstico y terapéutico del síncope en urgencias. Emerg. 2007;19(5): 273-82.
9. Osio LF, Velásquez JE, Tobón GJ, Posada G, Contreras E, Sánchez J, *et al*. Isquemia cerebral como manifestación inicial de un mixoma atrial izquierdo. Rev Colomb Cardiol. 2008;15(2):90-4.
10. Capilla-Montes MT, Gómez-Caravaca J, Fernández-Catalán C, Landaluce-Chaves M, Mira-Sirvent F, Masegosa-Medina JA. Embolismo paradójico: ¿Una entidad infrecuente o poco diagnosticada? Angiología. 2007;59(6):451-6.
11. Baquer M, Rodríguez L, Estallo L, Barba A. Embolismo paradójico coincidente con tromboembolismo pulmonar. Rev Fed Arg Cardiol. 2006;35:50-2.
12. López Vime R, Miguel Díez J, Jara Chinarro B. Embolismo paradójico. Arch Bronconeumol. 2001;37(5): 268-9.
13. Blanes Mompó JI, Lozano Vilardell P, Flores López D, Rimbau Muñoz EM, Corominas Roura C, Juliá Montoya J. Embolismo paradójico. Angiología. 1995;3:163-6.
14. Revuelto Rey J, Egea Guerrero JJ, Hinojosa Pérez R, Martín Bermúdez R. Isquemia arterial aguda causada por embolismo paradójico. Med Intensiva. 2010;34(4):287.
15. Barón A. Trombo mural gigante como causa de cardioembolismo. Presentación de un caso. Rev Colomb Cardiol. 2009;16(6):256-60.
16. Arauz A, Cantú C, Merlos Benítez M, Hernández Curiel B, Barinagarrementeria F, Roldan J. Enfermedad cerebrovascular como complicación de mixoma auricular. Reporte de seis casos y revisión de la literatura. Rev Mex Neuroci. 2010;11(3):194-8.
17. Kaori Uenishi E, Caldas MA, Saroute A, Mike Tsutsui J, Piotto G, Falcão S, *et al*. Uso da Ecocardio-

grafia Contrastada para Avaliação de Tumores e Trombos. Arq Bras Cardiol. 2008;91(5):e48-e52.
18. Portero Pérez MP, García-Blanco FR, Lacambra Blasco I, San Pedro Feliú A, Legazcue Goñi AI, Ferreira Montero IJ. Trombo intraventricular y angioma cavernoso en cerebelo: disyuntiva de terapéutica hipocoagulante. Rev Lat Cardiol. 2001;22: 116-9.
19. Veltri MA, Pérez MH, Soloaga ED, Chertcoff FJ, Manuale O, Ubaldini JE. Embolia paradojal inminente. Medicina (B. Aires). 2006;66(6):558-60.