



Right Ventricular Aneurysm in Chagas Disease Diagnosed by Echocardiogram

Aneurisma Ventricular Derecho Chagásico Diagnosticado por el Ecocardiograma

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SUMMARY

Right ventricular aneurysm in Chagas Cardiopathy is rarely mentioned in literature. The few reports are from anatomopathological studies. Echocardiographic studies had not described this abnormality, except for few articles published more than two decades ago. This is a patient presenting with advanced cardiac failure and biventricular aneurysm diagnosed by echocardiography. The reason for the rarity diagnosis of right ventricular aneurysm are discussed.

Descriptors: Ventricular Dysfunction, Right; Heart Aneurysm; Chagas Cardiomyopathy; Echocardiography/methods

RESUMEN

La presencia de aneurisma ventricular derecho en la cardiopatía chagásica es poco descrita en la literatura, siendo hallazgo principalmente de estudios anatomopatológicos. Excepción hecha a estudios realizados hace más de dos décadas, estudios con ecocardiografía no han presentado este hallazgo. Se relata el caso de un paciente portador de cardiopatía chagásica, con insuficiencia cardíaca refractaria y presencia de aneurisma ventricular izquierdo y derecho, al estudio ecocardiográfico transtorácico. Se discuten los motivos de la rareza del hallazgo de aneurisma en el ventrículo derecho.

Descriptores: Disfunción Ventricular Directa, Aneurisma Cardíaco, Cardiomiopatía Chagásica, Ecocardiografía/métodos

Introduction

Chagas Disease (CD), first described in 1909 by Carlos Chagas, a sanitary physician, has innumerable cardiac presentations, including ventricular aneurysms (tip aneurysm), which, for some authors, is a characteristic change of chronic chagas cardiopathy. Apical aneurysm preferable occurs in the left ventricle (LV), but anatomopathological studies have also shown apical aneurysm in the right ventricle (RV), isolated or associated to LV lesion, corresponding to 18% of the findings¹.

During a search made in Pubmed and Lilacs for studies involving echocardiography (ECHO), we have noted lack² or low prevalence^{3,4} of right ventricle apical aneu-

rysm detected by this diagnostic method. This is justified by the fact this is a rare finding and by the technical difficulty in assessing RV walls by ECHO.

We report below a case of a patient with chagas cardiopathy, advanced cardiac failure and biventricular aneurysm.

Case Report

Male patient, dark complexion, 70 years old, born in Patos de Minas, State of Minas Gerais, known to have chronic chagas cardiopathy (CCC), previously hospitalized due to cardiac failure (CF). The patient had previous history of permanent atrial fibrillation, systemic arterial

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hypertension, and chronic obstructive pulmonary disease. Smoker, no alcoholism. The patient was taking Furosemide 40 mg once daily + Enalapril 20 mg twice daily + Carvedilol 12.5 twice daily + Digoxin 0.25 mg once daily + Warfarin 5mg once daily. In June 20th, 2011, the patient was admitted to our institution with dyspnea

at rest, orthopnea, and lower limb edema. At physical examination, the patient had no fever, lower limb edema (4+/4+), engorged neck veins, tachydyspnea at rest (Respiratory Rate 20 breaths per minute), arrhythmic heart sounds with B3, Heart Rate 80 bpm, blood pressure 140/80 mmHg, bibasal crepitations, palpable liver + 10 cm of the right costal margin.

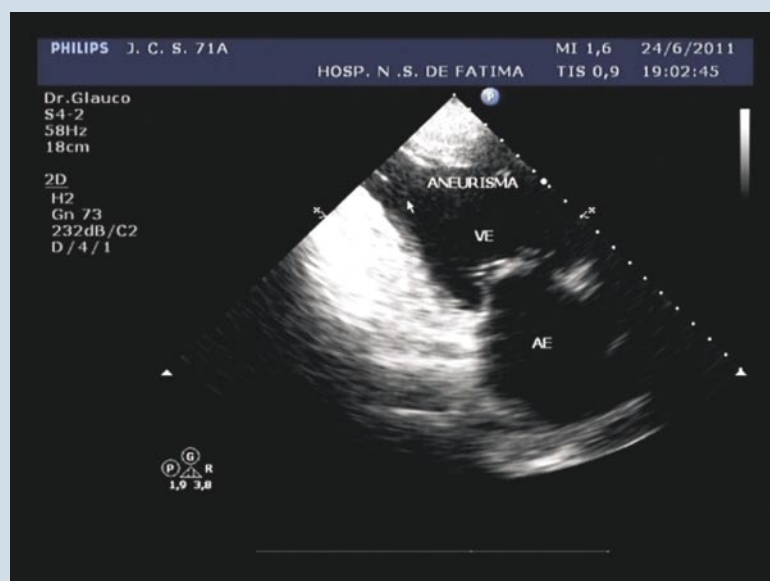


Figure 1: Aneurysm inferoapical segment of the left ventricle (LV - left ventricle, LA - Left Atrium)

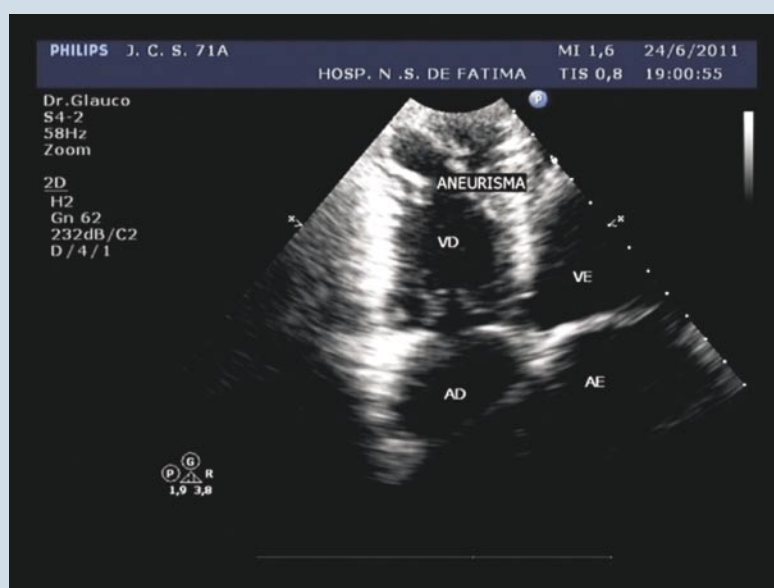


Figure 2: Aneurysm in medioapical portion of the free wall of the right ventricle (RV - Right Ventricular; AD - Right Atrium, LV - left ventricle, LA - Left Atrium)

At the electrocardiogram (ECG), the patient showed atrial fibrillation with adequate ventricle response, frequent and isolated polymorphic ventricular extrasystoles, left bundle branch complete block with 160 ms QRS, and secondary changes in ventricular repolarization. The chest teleradiography showed cardiomegaly with no signs of venous capillary congestion or pleural effusion.

The biochemical assessment showed a slight change in renal function (Urea 59 mg/dL, Creatinine 1.57 mg/dL, Creatinine Clearance – estimated by the Cockcroft & Gault formula – in 63 mL/min), hypopotassemia (Potassium 3.3 meq/L) and hyponatremia (Sodium 125 meq/L).

The ECHO showed significant dilation of the left chambers with aneurysm of the glove finger type in the apical portion of the lower wall (Figure 1), akinesia of the medioapical portion of lower-lateral and lower walls, other hypokinetic segments with LV ejection fraction estimated in 24%, right chambers with moderate dilation, thinning of the medioapical portion of the right ventricle free wall with aneurysm of the glove finger type (Figure 2), diffuse hypokinesia with moderate systolic dysfunction of the right ventricle by subjective analysis, systolic excursion of the tricuspid ring, tissue Doppler of the tricuspid ring and fractional shortening calculation. The analysis of the right ventricle systolic function was not performed



by strain due to unavailability of the software. Systolic pressure in pulmonary artery estimated in 54 mmHg.

In June 25th, 2011, the patient got worse and experienced cyanosis, mental confusion, significant tachydyspnea and hypotension. He was forwarded to the Intensive Care Unit (ICU), administered dobutamine and noradrenaline, with failed withdrawal attempts. The renal function and the cardiac failure of the patient got progressively worse, the patient had refractory cardiogenic shock, and died in August 12th, 2011.

Discussion

Chagas Disease is classified in two evolution stages: acute and chronic. In the chronic stage, there is the indeterminate type, in which the patient has positive serum results, but no cardiac structural changes, cardiac failure symptoms, digestive changes, and the cardiac type with or without ventricular dysfunction⁵. Despite some reports of isolated right ventricular dysfunction⁶, right ventricle involvement in CCC is usually associated to significant systolic dysfunction of the left ventricle in studies conducted with ECHO⁷, and its presence represents an independent marker of less functional capacity⁸.

In an anatomopathological study involving 1,153 necropsies of CCC patients, the incidence of tip aneurysm was 52%, without any statistical difference between genders. 9% of the cases showed biventricular aneurysm, and 9% showed isolated right ventricle aneurysm.

The involvement of the right ventricle in Chagas Disease diagnosed by echocardiogram implicates in a worse prognosis⁹. Few studies conducted with echocardiogram have shown the presence of right ventricle aneurysms. Lopes et al.³, studied 20 patients with apical aneurysm of the left ventricle and compared the findings of the cineventriculography with that of ECHO. They found three cases of biventricular aneurysm, although this was not the objective of the study. Acqua-tella et al.⁴ observed right ventricle aneurysm in 4 out of 41 patients under study. These patients also showed left ventricle involvement⁴. However, most of the studies have not shown these changes.

A reasonable explanation for the low prevalence of right ventricle aneurysm findings during ECHO is that echocardiography analysis of the right ventricle is limited due to the position of the right chamber close to the sternum, in addition to its complex geometry.

Another explanation for the very small number of studies that show right ventricle aneurysm is certainly the lower incidence of this condition, probably due to the lower pressure regime of the right ventricular cavity, anatomical position of the right ventricle apical muscle, thin wall with a slight thickness difference between the apex and the middle third, thicker trabecules, trabecules in greater number and more anastomosed trabecules in relation to the left vortex, and the unique characteristic of the right ventricle tip, which, differently from the left ventricle, belongs to the filling and not the ejection chamber¹⁰.

It is important to note that right ventricle aneurysm occurs in other situations besides Chagas Disease, such as acute myocardial infarction¹¹, acute myocarditis¹² and arrhythmogenic right ventricle dysplasia¹³.

Conclusion

The echocardiogram has an important role in the assessment of Chagas Disease. Studies have shown global and segmental changes since the seventies¹⁴. However, ECHO has been failing in detecting right ventricle aneurysm in CCC due to its lower prevalence and technical difficulties related to the method. We believe right ventricle aneurysm must be investigated in Chagas Disease patients in a systematic way to provide the physician with an indication of a probable unfavorable prognosis.

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