CASE REPORT

Cardiac Sarcoidosis: A Description of Three Case Reports

ENZO L. GONZÁLEZ[1], CARLOS VIGLIANO[2], FLORENCIA RENEDO[1], MIRTA DIEZ[MTSAC, 3], JORGE CÁNEVA[4]

Received: 11/24/2009
Accepted: 01/06/2009

Address for reprints:
Dr. Enzo Luis González
Río de Janeiro 284 - Piso 10 - Dpto. M
(1405) Ciudad Autónoma de Buenos Aires, Argentina
e-mail: enzoluisgonzalez@hotmail.com

SUMMARY

Sarcoidosis is a multisystemic disease of unknown etiology that may affect any organ in the body. The prevalence of sarcoidosis varies widely in different countries and populations. Several reports have suggested that cardiac involvement is associated with adverse outcomes. There are only a few case reports of cardiac sarcoidosis in Latin America and there is no clear agreement regarding the diagnostic and therapeutic aspects of this disease. We describe three case reports of cardiac sarcoidosis with their corresponding clinical, electrocardiographic and imaging characteristics, the histopathological findings of endomyocardial biopsy in two cases, and the clinical course during follow-up.

Rev Argent Cardiol 2010;78:361-363

Key words > Sarcoidosis - Granuloma - Cardiac Arrhythmia - Heart Failure

Abbreviations >

AVB	Atrioventricular block	**ACEI**	Angiotensin-converting enzyme inhibitor
EMB	Endomyocardial biospsy	**CS**	Cardiac sarcoidosis

BACKGROUND

Sarcoidosis is a granulomatous multisystemic disease of unknown etiology that presents most often in young adults. In the United States the incidence of sarcoidosis is 10.9 per 100000 in Caucasians and varies across the world. Although there are no population studies in Latin America, some authors think that the incidence of the disease is this region might be lower. (1, 2) Any organ can be affected; yet, 90% of granulomas appear in the lungs, lymph nodes, skin and eyes. Although cardiac involvement is present in about 25% of cases according to different autopsy studies, only about 5% of patients have symptoms. (1-3) Despite cardiac involvement is infrequent, it is associated with adverse outcomes. Granulomatous lesion promotes a repair process with production of collagen by fibroblasts and loss of the normal architecture and function of the tissues involved. Cardiac involvement is most frequent in the left ventricular free wall, interventricular septum, cardionector system, right ventricle and pericardium. (3, 4)

We describe three case reports of cardiac sarcoidosis (CS) with their corresponding clinical characteristics and long-term outcomes.

CASE REPORTS

Case 1

A 30 year-old man presented with dyspnea and palpitations. The electrocardiogram showed 2:1 atrioventricular block (AVB) that alternated with complete AVB with a heart rate of 35 beats per minute. Echocardiography revealed the presence of dilated cardiomyopathy with severe left ventricular dysfunction and ventricular septal thickening. Coronary angiography showed absence of lesions in the coronary arteries. Endomyocardial biopsy (EMB) documented sarcoid-like granulomas with epithelioid cells and Langhans giant cells. Other granulomatous diseases such as tuberculosis and deep mycosis were ruled out. Chest computed tomography and spirometry tests were normal. A definite pacemaker was implanted and high doses of corticosteroids were indicated. Three months after the initial diagnosis, the echocardiogram showed progressive ventricular dilation. The patient was hospitalized several times due to heart failure despite therapy with beta blockers, angiotensin-converting enzyme inhibitors (ACEIs) and spironolactone. He died 10 months after the diagnosis of CS due to sustained ventricular tachycardia unresponsive to electrical cardioversion.

Case 2

A 45 year-old man with palpitations and a history of

University Hospital, Fundación Favaloro. Autonomous City of Buenos Aires, Argentina
[MTSAC]Full Member of the Argentine Society of Cardiology
[MTSAC]Department of Clinical Cardiology
[2]Department of Anatomical Pathology
[3] Heart Failure and Transplant Unit
[4] Department of Pulmonology

pulmonary sarcoidosis and neurosarcoidosis was evaluated with 24-hour Holter monitoring which evidenced first degree AV block with right bundle branch block alternating with complete AV block and pauses longer than 2 seconds. The initial echocardiogram was normal. A definite pacemaker was implanted. An echocardiogram performed 3 months later showed dilated cardiomyopathy with severe left ventricular dysfunction and severe functional mitral regurgitation. Coronary angiography showed absence of lesions in the coronary arteries. Therapy with ACEIs, beta blockers and high doses of corticosteroids was initiated. Twelve months later ventricular diameters had reduced and systolic function improved. He has not been rehospitalized and remains in good functional class 15 months after the diagnosis of CS.

Case 3

A 24 year-old woman with a history of pericarditis presented with syncope due to sustained ventricular tachycardia. Baseline electrocardiogram showed first degree AVB with abnormal Q waves and ST elevation in the inferior leads. Coronary angiography showed absence of lesions in the coronary arteries. The echocardiogram revealed severe biventricular dysfunction and hypokinesia particularly in the inferior wall. The EMB revealed the presence of interstitial and subendocardial granulomas with giant cells surrounded by fibrosis, suggestive of CS (Figure 1). She was treated with ACEIs, amiodarone and high doses of corticosteroids. After 18 months the echocardiogram revealed improvement of the systolic function in both ventricles. The patient has not been rehospitalized and remains free of symptoms 16 years after the diagnosis.

DISCUSSION

CS may present with a variety of symptoms; the most frequent presentations are severe conduction abnormalities in young patients, complex ventricular arrhythmias and dilated cardiomyopathy, as in the cases here presented.

The diagnostic yield of EMB has been reported to be as low as 20% because of the patchy distribution of the disease, and granulomas and fibrotic scars are not mainly located in the right ventricular where the samples are taken. (5) In the present series we have documented lesions suggestive of CS in two patients with consistent clinical signs. According to The Japanese Ministry of Health and Welfare guidelines from 1993, the diagnosis of CS can be made using histological and clinical criteria (Table 1). (6)

Although spontaneous resolution of the disease is observed in 2 / 3 of patients in the first 3 years after diagnosis, CS, as other forms of extrapulmonary disease, is associated with adverse outcomes. Mean survival is two years in patients who are receiving treatment with corticosteroids, and five-year survival is 40% to 60% in those under treatment. Low functional status, the presence of dilated cardiomyopathy and sustained ventricular arrhythmias are predictors of mortality. Cardiac involvement is the main cause of death after ventilatory failure, and the incidence of sudden death due to complete AV block or ventricular arrhythmia is high. (1, 2, 7)

Despite treatment with corticosteroids has not been evaluated in large randomized controlled studies, several series recommend their indication as first line therapy in order to prevent progression of inflammation and to improve the prognosis of the disease, particularly when it is initiated in

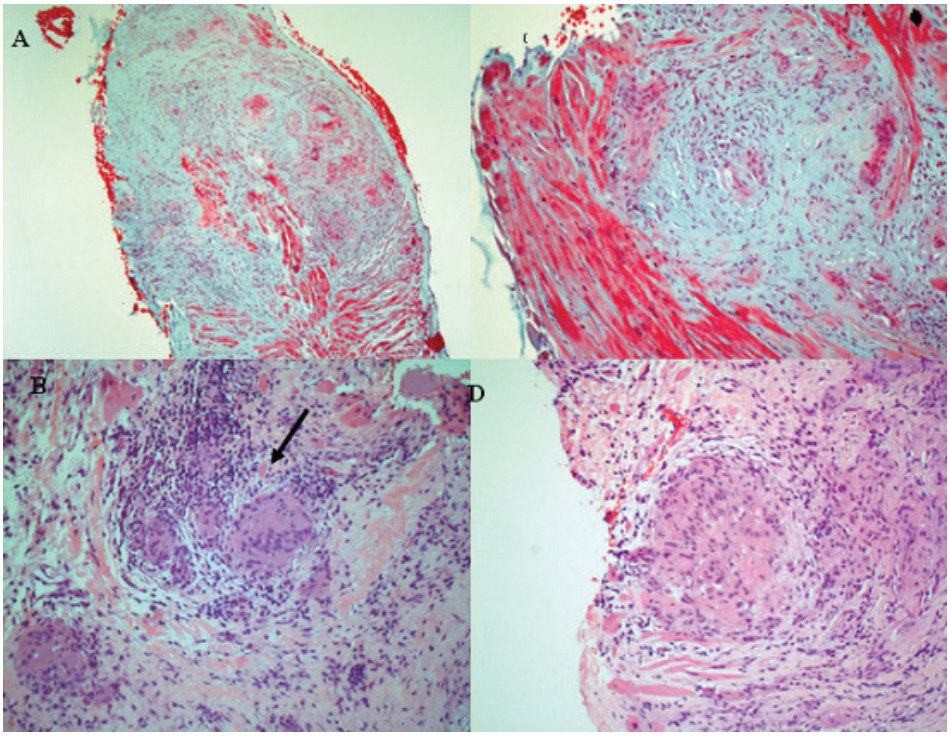

Fig. 1. Panels A and B show cardiac involvement with multiple granulomas (arrow). Panels C and D show, in detail, the histological findings of the EMB of patient 3 with the typical non-caseating granulomas with multinucleated giant cells surrounded by lymphocytes and peripheral fibrosis.

Table 1. Guidelines for the diagnosis of cardiac sarcoidosis from The Japanese Ministry of Health and Welfare (6)

1. Histologic diagnosis group.
Endomyocardial biopsy or postoperative samples demonstrate epithelioid granulomata without caseating granulomata.

2. Clinical diagnosis group.
In patients with histologic diagnosis of extracardiac sarcoidosis, cardiac sarcoidosis is suspected when A and at least one of criteria B to E is present.
A. Complete RBBB. LAH. AVB. VT. VPBs (> Lown 2). Abnormal Q waves or ST-T change on resting or ambulatory electrocardiogram.
B. Abnormal wall motion, regional wall thinning, or dilation of the left ventricle.
C. Perfusion defect by 201thallium-myocardial scintigraphy or abnormal accumulation by 67Ga-citrate or 99mTc-PYP myocardial scintigraphy.
D. Abnormal intracardiac pressure, low cardiac output, or depressed ejection fraction of the left ventricle.
E. Interstitial fibrosis or cellular infiltration over moderate grade, even if the findings are non-specific.

RBBB: Right bundle branch block. LAH: Left anterior hemiblock. AVB: Atrioventricular block. VT: Ventricular tachycardia. VPB: Ventricular premature beat.

early stages, as in cases 2 and 3. (8) Early implant of devices is recommended in cases of CS with conduction disturbances or ventricular arrhythmias. The use of these devices has reduced the incidence of sudden death reported in previous series, and heart failure is currently the most frequent cause of death in patients with CS. (9)

Heart transplantation should be considered in patients with dilated cardiomyopathy and/or refractory ventricular arrhythmias. CS should not discourage the indication as recurrences are infrequent. (10)

Despite advances in the understanding of the pathophysiology and the use of high-tech in the diagnosis and treatment of CS, there are no conclusive data in the Latin American population. In this sense, prospective studies and updated consensus guidelines are necessary to assist the cardiologist in diagnostic and therapeutic decision-making in clinical practice.

RESUMEN

Sarcoidosis cardíaca: descripción de tres casos

La sarcoidosis es una enfermedad multisistémica de etiología desconocida que puede afectar cualquier órgano. Presenta considerables diferencias en su prevalencia según los distintos países y razas. Diversas comunicaciones sugieren que el compromiso cardíaco determina mal pronóstico. Existen pocas series clínicas de sarcoidosis cardíaca en Latinoamérica y no hay consenso claro acerca de los aspectos diagnósticos y terapéuticos de esta patología. En esta presentación se describen tres casos de sarcoidosis cardíaca, sus características clínicas, electrocardiográficas, métodos de imágenes y, en dos de ellos, la anatomía patológica del material obtenido mediante biopsia endomiocárdica. Se refiere, asimismo, la evolución final de los pacientes durante el seguimiento.

Palabras clave > Sarcoidosis - Granuloma - Arritmia cardíaca - Insuficiencia cardíaca

BIBLIOGRAPHY

1. Iannunzzi M, Rybicki B, Teirstein A. Sarcoidosis. N Engl Med 2007;357:2153-65.

2. Kim JS, Judson MA, Donnino R, Gold M, Cooper LT Jr, Prystowsky EN, et al. Cardiac sarcoidosis. Am Heart J 2009;157:9-21.

3. Roberts WC, McAllister HA Jr, Ferrans VJ. Sarcoidosis of the heart. A clinicopathologic study of 35 necropsy patients (group I) and review of 78 previously described necropsy patients (group II). Am J Med 1977;63:86-108.

4. Silverman KJ, Hutchins GM, Bulkley BH. Cardiac sarcoid: a clinicopathologic study of 84 unselected patients with systemic sarcoidosis. Circulation 1978;58:1204-11.

5. Uemura A, Morimoto S, Hiramitsu S, Kato Y, Ito T, Hishida H. Histologic diagnostic rate of cardiac sarcoidosis: evaluation of endomyocardial biopsies. Am Heart J 1999;138:299-302.s:

6. Hiraga H, Yuwai K, Hiroe M. Guideline for diagnosis of cardiac sarcoidosis: study report on diffuse pulmonary diseases from the Japanese Ministry of Health and Welfare. Tokyo: Japanese Ministry of Health and Welfare 1993:23-24.

7. Doughan AR, Williams BR. Cardiac sarcoidosis. Heart 2006;92:282-8.

8. Yazaki Y, Isobe M, Hiroe M, Morimoto S, Hiramitsu S, NakanoT, et al. Prognostic determinants of long-term survival in Japanese patients with cardiac sarcoidosis treated with prednisone. Am J Cardiol 2001;88:1006-10.

9. Paz HL, McCormick DJ, Kutalek SP, Patchefsky A. The automated implantable cardiac defibrillator. Prophylaxis in cardiac sarcoidosis. Chest 1994;106:1603-7.

10. Zaidi AR, Zaidi A, Vaitkus PT. Outcome of heart transplantation in patients with sarcoid cardiomyopathy. J Heart Lung Transplant 2007;26:714-7.