
Case report - Cardiac general

Surgical removal of a left ventricular thrombus associated with cardiac sarcoidosis

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Abstract

We report successful surgical management of a 31-year-old man with a left ventricular thrombus following heart failure due to cardiac sarcoidosis. Preoperative echocardiography showed diffuse hypokinesis and a mobile ball-like thrombus in the left ventricle. Computed tomography revealed a left ventricular tumor and bilateral hilar lymphadenopathy, while MRI of the brain showed small infarctions in the occipital lobe. Postoperative pathologic examination of a specimen from the left ventricular free wall and a mediastinal lymph node revealed non-caseating granulomas consistent with cardiac sarcoidosis. The patient was referred to a cardiologist for further treatment with prednisolone. This is a rare case of surgical removal of a left ventricular ball-like thrombus in a patient with cardiac sarcoidosis.

Keywords: Cardiac sarcoidosis; Left ventricular thrombus; Cardiac surgery

1. Introduction

Sarcoidosis is a systemic disorder of unknown cause that is characterized by the presence of non-caseating granulomas in multiple organs. Cardiac involvement has been demonstrated in 20–50% of sarcoidosis patients in autopsy studies, although clinical cardiac manifestations are only seen in about 5% of sarcoidosis patients [1]. Cardiac sarcoidosis is associated with significant morbidity and mortality due to fatal arrhythmia, atrioventricular conduction disturbances and refractory congestive heart failure caused by cardiomyopathy, but its diagnosis is not always easy [2]. In the present report, we describe successful surgical removal of a left ventricular ball-like thrombus in a patient with cardiac sarcoidosis. The findings suggested that hypokinesis accompanying the cardiac sarcoidosis caused the formation of the left ventricular (LV) thrombus.

2. Case report

A 31-year-old man was admitted to our hospital due to orthopnea arising from congestive heart failure. On admission, an electrocardiogram showed a heart rate of 110 beats/minute and a regular sinus rhythm. A chest X-ray revealed pulmonary congestion and bilateral hilar lymphadenopathy (BHL). Echocardiography performed immediately further revealed mild mitral insufficiency with LV dysfunction (LV internal diastolic dimension: 59.9 mm; LV ejection fraction: 23%) and a ball-like thrombus in the apex of the left ventricle, without thinning of the ventricular septum or posterior wall. Chest computed tomography also revealed the left ventricular thrombus and BHL. Fortunately, there were no neurological symptoms. However, MRI of the brain showed small cerebral infarctions in the occipital lobe due to embolization (Fig. 1). Coronary angiography was normal. From the results of these examinations, sarcoidosis was strongly suspected, suggesting that the congestive heart failure was caused by cardiac sarcoidosis. Initially, he was treated medically. Subsequently, he underwent urgent LV thrombectomy. Under mild hypothermic cardiopulmonary bypass and cardioplegic arrest, the LV anterior wall was incised at 2 cm apart from and parallel to the left anterior descending artery. The incision was extended by 3 cm distally to the second diagonal branch. We located a 2.5×1.5 cm pedunculated friable mass with a regular surface in the LV cavity that was attached to the apical septum by a stalk. The thrombus was removed and the ventricular cavity was irrigated (Fig. 2). Histological examination confirmed the diagnosis of the freshly isolated thrombus. The ventriculotomy was repaired with double PTFE felt reinforcement. We also resected a mediastinal lymph node. Postoperative pathologic examination of a specimen from the LV free wall and the mediastinal lymph node revealed non-caseating granulomas consistent with cardiac sarcoidosis. This is a rare case of cerebral infarction due to an LV thrombus that occurred in a patient with cardiac sarcoidosis. The postoperative course was uncomplicated, and warfarin therapy was started. The patient was referred to a cardiologist for further treatment with prednisolone.
Fig. 1. (a) Echocardiography shows left ventricular dilatation and a ball-like thrombus of approximately $17 \times 28$ mm in the apex of the left ventricle. (b) MRI of the brain shows small infarctions in the occipital lobe due to embolization (arrows). (c) Chest computed tomography reveals bilateral hilar lymphadenopathy.

3. Discussion

Cardiac sarcoidosis is a rare cause of cardiomyopathy that can lead to clinical heart failure and ventricular arrhythmias. Cardiac dysfunction is often severe and progressive. Treatment of cardiac sarcoidosis is difficult. Permanent pacing or an implantable cardioverter-defibrillator may be considered in patients with arrhythmias. Heart transplantation has been performed in selected patients with end-stage heart failure [3]. There are currently no adequate guidelines for ventricular reduction in global dysfunction without an LV aneurysm. In existing reports, New York Heart Association functional class III or IV adult patients with non-ischemic cardiomyopathy and an LV end-diastolic dimension of $>70$ mm are candidates for ventricular reduction. Although the global LV contractility was reduced in the present case, the LV end-diastolic dimension was 59.9 mm. Therefore, we did not perform LV volume reduction.

An LV thrombus is an uncommon primary disease. It usually follows acute myocardial infarction, but rarely follows cardiac sarcoidosis. In particular, a ball-shaped thrombus is associated with a higher risk of systemic embolism. It may be preferable to submit such patients to surgical removal, due to the risk of systemic emboli and sudden death. Making an incision in the ventricular wall may cause further deterioration of the LV function, especially if the LV function is already poor. In addition, an incision in the ventricular wall may increase the risk of bleeding, and ventriculotomy may potentially induce ventricular arrhythmia and poor function. Alternative techniques for extraction of an LV thrombus have been described, including transaortic extraction using a thoroscope [4] and passing a mediastinoscope through the mitral valve for complete extraction [5]. However, we did not consider that any of these alternatives were appropriate in the present patient. We believe that it is important to perform a left ventriculotomy to inspect the cavity thoroughly for any further pathology. In addition, if the mass is myxomatous, it is important to remove the entire tumor, including the stalk, and hence good exposure is mandatory.

Fig. 2. Surgical specimen of the mobile ball-like thrombus.
Corticosteroids may be useful for patients with conduction disturbances and myocardial dysfunction due to sarcoidosis. Long-term benefits of steroid therapy in reducing clinical morbidity and mortality have been demonstrated [6]. In the early or middle stage of cardiac sarcoidosis, steroid therapy may be protective or therapeutic in preventing LV remodeling and preserving LV function. However, it may not be as effective in the late stage [7]. The present patient was given prednisolone, the starting dose of prednisolone was 60 mg every other day for two months, and this was gradually tapered to a final maintenance dose of 10 mg every other day. Thus, early diagnosis and estimation of disease activity are critically important in the treatment of cardiac sarcoidosis. However, these aspects are often difficult, particularly in cases without any definite extracardiac organ involvement [2]. Furthermore, during the course of disease progression, it is sometimes quite difficult to distinguish cardiac sarcoidosis from idiopathic dilated cardiomyopathy.

In conclusion, we report a successful case of surgical removal of a thrombus in the LV with heart failure due to cardiac sarcoidosis. However, the long-term outcome of this treatment remains unknown, and careful follow-up is required.

References