Case Report

Severe mitral regurgitation caused by eosinophilic endocarditis

I.M. van Dongen (BSc)a, D.J.W. van Kraaij (MD, PhD)a, S. Schalla (MD, PhD)b, H.P. Brunner-La Rocca (MD, PhD)b, R.G.H. Driessen (MD)b,*
a Orbit Medisch Centrum, Department of Cardiology, Sittard, The Netherlands
b Maastricht University Medical Centre, Department of Cardiology, Maastricht, The Netherlands

ARTICLE INFO

Article history:
Received 24 March 2014
Received in revised form 24 April 2014
Accepted 23 May 2014

Keywords:
Loeffler’s endocarditis
Cardiac magnetic resonance imaging
Echocardiography
Eosinophilia

ABSTRACT

We describe a patient with symptoms of heart failure caused by severe mitral regurgitation. Echocardiography revealed an intracardiac mass embedding the posterior mitral valve leaflet, and cardiac magnetic resonance imaging showed two intracardiac thrombi and endomyocardial fibrosis. Eosinophil count kept rising and a mutation in the gene for platelet-derived growth factor receptor alpha was found. The combination of these findings led to the diagnosis of Loeffler’s endocarditis. Treatment with prednisone and a tyrosine kinase inhibitor resulted in complete remission of the hypereosinophilia and mitral valve regurgitation was only mild at 9-month follow-up visit.

< Learning objective: This case report presents a patient with severe mitral regurgitation and heart failure due to hypereosinophilic syndrome (HES). It leads to thrombus formation and endomyocardial thickening due to eosinophilic infiltration of the myocardium. Treatment with steroids and a tyrosine kinase inhibitor led to clinical improvement and only mild mitral regurgitation after 6 months. Loeffler’s endomyocarditis is a model disease for restrictive cardiomyopathy. It is important to recognize and treat this disease early and prevent morbidity and mortality. As far as we know there is no previous case report that describes the reversibility of severe mitral regurgitation after pharmacological treatment of HES, not needing mitral valve replacement.>

Introduction

We describe a patient presenting with heart failure due to severe mitral regurgitation and hypereosinophilia, confirmed to be Loeffler’s endomyocarditis. It was successfully treated with steroids and imatinib and the patient was at New York Heart Association (NYHA) class I after 9-month follow up and mitral regurgitation was only mild at that time. Although several case reports describe cases of Loeffler’s endocarditis, this case report shows a case of a relatively young patient with potential fully reversible disease if recognized and treated early.

Case report

A 51-year-old woman with unremarkable medical history was admitted with chest pain, dyspnea at rest, orthopnea, and leg edema. Blood pressure was 120/80 mmHg, heart rate 115 bpm and regular. Clinical examination revealed signs of heart failure and a mitral regurgitation murmur on auscultation. Left atrial dilatation and nonspecific repolarization abnormalities were seen on electrocardiography (ECG) and pulmonary congestion on chest X-ray. Initial laboratory results showed slight elevation of troponin-I to 0.64 μg/L (norm: <0.04 μg/L) and iron deficiency [ferritin 11 μg/L (20–250 μg/L)] with microcytic anemia [hemoglobin 5.2 mmol/L (7.5–10.0 mmol/L), mean corpuscular volume 81 fL (82–98 fL)]. The eosinophil granulocyte count was high: 13.1% (1.0–6.0%), absolute count 1.80 × 10⁹/L.

Intravenous diuretics led to clinical improvement. On coronary angiography, only mild wall irregularities were detected. Echocardiography revealed an intracardiac mass embedding the posterior mitral valve leaflet, and cardiac magnetic resonance imaging showed two intracardiac thrombi and endomyocardial fibrosis. Eosinophil count kept rising and a mutation in the gene for platelet-derived growth factor receptor alpha was found. The combination of these findings led to the diagnosis of Loeffler’s endocarditis. Treatment with prednisone and a tyrosine kinase inhibitor resulted in complete remission of the hypereosinophilia and mitral valve regurgitation was only mild at 9-month follow-up visit.

We describe a patient with symptoms of heart failure caused by severe mitral regurgitation. Echocardiography revealed an intracardiac mass embedding the posterior mitral valve leaflet, and cardiac magnetic resonance imaging showed two intracardiac thrombi and endomyocardial fibrosis. Eosinophil count kept rising and a mutation in the gene for platelet-derived growth factor receptor alpha was found. The combination of these findings led to the diagnosis of Loeffler’s endocarditis. Treatment with prednisone and a tyrosine kinase inhibitor resulted in complete remission of the hypereosinophilia and mitral valve regurgitation was only mild at 9-month follow-up visit.

< Learning objective: This case report presents a patient with severe mitral regurgitation and heart failure due to hypereosinophilic syndrome (HES). It leads to thrombus formation and endomyocardial thickening due to eosinophilic infiltration of the myocardium. Treatment with steroids and a tyrosine kinase inhibitor led to clinical improvement and only mild mitral regurgitation after 6 months. Loeffler’s endomyocarditis is a model disease for restrictive cardiomyopathy. It is important to recognize and treat this disease early and prevent morbidity and mortality. As far as we know there is no previous case report that describes the reversibility of severe mitral regurgitation after pharmacological treatment of HES, not needing mitral valve replacement.>

© 2014 Japanese College of Cardiology. Published by Elsevier Ltd. All rights reserved.

* Corresponding author at: Maastricht University Medical Centre, Department of cardiology, P. Debyelaan 25, 6229 HX Maastricht, The Netherlands.
Tel.: +31 43 387 6543; fax: +31 43 387 4330.
E-mail addresses: robdriessen@mumc.nl, robdriessen@hotmail.com (R.G.H. Driessen).

http://dx.doi.org/10.1016/j.jccase.2014.05.012
1878-5409/© 2014 Japanese College of Cardiology. Published by Elsevier Ltd. All rights reserved.
the basal-lateral thrombus, suggesting endomyocardial fibrosis and Loeffler’s endocarditis. This increased signal intensity was also seen diffusely at the border of myocardial tissue and the lumen.

Supplementary Video 1 related to this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jccase.2014.05.012.

Eosinophilic granulocyte count reached its maximum of 46.0% (absolute count 6.12×10^9/L), without any secondary cause for this eosinophilia. Bone marrow aspiration disclosed mostly eosinophilic granulocytes, leading to the diagnosis of myeloproliferative hypereosinophilic syndrome (HES) due to chronic eosinophilic leukemia (CEL). Therefore, prednisone was started intravenously. Cytogenetic testing was performed presenting a mutation in the gene for the platelet-derived growth factor receptor alpha (PDGFRα). This mutation displays constitutive tyrosine kinase activity; hence we added a tyrosine-kinase inhibitor (imatinib) to the treatment regimen of our patient. Also, oral anticoagulant therapy was initiated. Eosinophil count normalized during follow-up and echocardiography after 9 months showed only mild residual mitral valve regurgitation and the patient was in NYHA class I. There was no need for surgical treatment (mitral valve replacement).

Discussion

In 1936, Wilhelm Loeffler described a type of endo(myo)carditis caused by infiltration of eosinophils (Loeffler’s endocarditis), which can cause serious cardiac complications, stressing the need for early diagnosis and treatment. In the absence of secondary causes of peripheral eosinophilia, Loeffler’s endocarditis is mainly caused by HES. It progresses through three stages: a necrotic stage with eosinophilic infiltration of the myocardium, a thrombotic stage, and a final fibrotic stage resulting in restrictive cardiomyopathy [1].

Diagnostic criteria of HES include:

1. Persistent eosinophilia of ≥1500 eosinophils/mm³ for >6 months;
2. Lack of known causes of eosinophilia;
3. Signs and symptoms of organ involvement by eosinophilic infiltration.

HES is a rare disease with an incidence in the USA of 0.035 per 100,000, with a male-to-female ratio of 1.47 and age of onset between 20 and 50 years. Particularly when PDGFRα associated, it has a high incidence of potentially lethal cardiac complications if untreated [2]. Prevalence of cardiac involvement is 50–75%.

In Loeffler’s endocarditis, typical echocardiographic findings include progressive endo(myo)cardial thickening, intracardiac thrombus formation, and mitral regurgitation due to entrapment of the chordae tendinae of the posterior leaflet during the fibrotic stage of this disease. Often, restrictive filling pattern of the left ventricle is present [3]. Echocardiography may underestimate the extent of mural thrombosis. CMR has a higher sensitivity and specificity for detection of ventricular thrombi and can obviate the need for frequent endomyocardial biopsy [4]. False negative findings occur in right ventricle (RV) biopsies and complications are common. For that reason and lack of residual diagnostic uncertainty, we did not perform RV biopsy in our patient.

Intracardiac thrombi are frequent due to expression of tissue factor by infiltrating eosinophils [2]. Anticoagulant therapy is advised, though not always effective. Corticosteroids are the cornerstone of treatment of hypereosinophilia. For PDGFRα/β related neoplasms with eosinophilia (e.g. CEL), a new effective treatment modality (imatinib, a tyrosine-kinase inhibitor) has emerged. This emphasizes the importance to seek for this mutation in CEL patients.

Valve repair or replacement in persisting valvular regurgitation and endocardectomy in advanced disease are surgical treatment options. Postoperative mechanical valve thrombosis in persisting...
hypereosinophilia can occur, stressing the need for adequate medical treatment before surgery is performed [5]. Our patient responded well to medical treatment and at 9-month follow-up residual mitral valve insufficiency was only mild. Valve repair or replacement will therefore not be necessary in our patient.

In conclusion, Loeffler’s endocarditis is a rare and treatable cause of heart failure and valvular heart disease due to endo(myo)cardial thickening and thrombus formation and is considered a model disease of restrictive cardiomyopathy.

Conflict of interest

The authors declare no conflict of interest.

References