Case Report

Infective endocarditis complicated with splenic abscess successfully treated with splenectomy followed by double valve replacement

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Summary Splenic abscess (SA) is a rare complication of infective endocarditis (IE). A successful outcome lies with a choice between medical and surgical treatments. However, there is still insufficient evidence in the decision-making process.

Our patient was a 73-year-old male who complained mainly of fever and general fatigue. An echocardiography showed vegetation of 10 mm in diameter and severe mitral and aortic regurgitation and a diagnosis was made of IE. Because of a recent brain embolism, we decided to treat him initially with medical therapy. Antibiotics were effective, but on the 28th day after starting treatment, he complained of left upper abdominal pain. An abdominal computed tomography scan showed SA. The administration of vancomycin did not improve the condition. We decided that he should undergo surgical treatment.

A splenectomy was performed and 9 days after the splenectomy, the mitral and aortic valves were successfully replaced.

There is still no clear-cut evidence to support the order of surgical interventions. Indeed, the current guidelines, which recommend that splenectomy is to be performed first, are not supported by strong evidence. The present case report showed that splenectomy before valve surgery successfully treated the patient.

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Introduction

Infective endocarditis (IE) is a severe systemic infection; in most cases deciding the best treatment is challenging. There are several reports that 3–5% of all IE cases are
complicated by the development of splenic abscess (SA) [1]. Medical treatments on their own give unsatisfactory results, and therefore surgical treatments, such as splenectomy and valve replacement, have become standard strategies. However, it has not been established which of these procedures should be carried out first.

We report a case of a 73-year-old male with IE complicated with SA, who was treated with splenectomy followed by double valve replacement.

Case report

A 73-year-old male, complaining mainly of fever and general fatigue was emergently admitted to our hospital. He had medical history of hypertension. He received regular oral care at a dental clinic on a monthly basis. The present illness evolved as follows. He developed a low-grade fever and general fatigue 2 months before hospitalization. A thoracic and abdominal computed tomography (CT) scan and gastrointestinal endoscopies revealed no abnormality. Blood examinations showed a persistent increase in white blood cell count (WBC) and C reactive protein (CRP) values. He was referred to our hospital for further evaluation. An echocardiography revealed vegetation attached to the anterior mitral leaflet and the patient was diagnosed as having IE.

The results of physical examination at admission were as follows: height, 150.0 cm; weight, 50 kg; blood pressure, 124 mmHg (systolic) and 69 mmHg (diastolic); heart rate, 103 beats/min; body temperature, 37.1 °C; SpO2, 98% (room air). A systolic murmur (Levine III/VI) was heard at the apex and diastolic murmur (Levine II/VI) on 2nd right sternal border. Lung auscultation was normal. Blood examinations showed the following: WBC 10,900 cells/μl, hemoglobin 11.2 g/dl, platelets 219,000 cells/μl, CRP concentration 4.5 mg/dl, brain natriuretic peptide concentration 176.6 pg/ml.

In addition, blood cultures were positive for Enterococcus faecalis. An echocardiography revealed a low echoic lesion that was 10 mm in diameter attached to the anterior mitral leaflet (Fig. 1), as well as severe aortic regurgitation and severe mitral regurgitation with prolapsed anterior leaflet. Left ventricular systolic function was normal. Magnetic resonance imaging of the brain revealed a high intensity spot on the left cerebella by diffusion weighted imaging. After admission, the patient was given medical therapy with sulbactam/ampicillin (SBT/ABPC) and gentamycin. Given the size of the vegetation, surgical therapy should have been considered, but we continued with medical therapy because the cerebral embolic event was thought to have occurred recently. At 3 days after starting the therapy, we switched from SBT/ABPC to ABPC after having checked the result of an antibiotic sensitivity test. The medical therapy was thought to be effective, because no fever was found, blood examinations showed an improvement in inflammatory markers, and the size of vegetation was gradually reduced.

However, on the 28th day after starting the therapy, the patient complained of left abdominal pain. An abdominal enhanced CT scan revealed a low attenuation area in the spleen with an irregular edge (Fig. 2) and SA was diagnosed.

Figure 1 A low echoic lesion (arrow) that was 10mm in diameter attached to the anterior leaflet of the mitral valve, visualized by echocardiography.

Figure 2 A low attenuation area (arrow) with an irregular enhanced edge, visualized by CT scan.

We could not detect apparent change in the size of vegetation compared to the size before the occurrence of SA. The administration of vancomycin did not improve the condition. We changed the treatment policy to surgical treatment. Splenectomy by open surgery was performed, followed by mitral and aortic valve replacements on the 9th day after the splenectomy. Valve replacement was performed 5 days later than scheduled, because of bleeding complications. The clinical course of the patient after these valve replacements was free of any trouble as of 6 months after the operation. His clinical course is summarized in Fig. 3.

Discussion

IE is a serious systemic infection and, in most cases, deciding the best treatment strategy is difficult. The incidence of IE cases with splenic complications is between 19 and 36% [2], including cases accidentally found by screening tests. On the other hand, the incidence of IE cases with SA is between 3 and 5% [1]. There are two mechanisms of abscess formation;
one is caused by any embolic event based on septicemia and the other, by the direct infiltration of bacterium. Typical symptoms of SA are reported to be fever and abdominal pain and clinical findings are splenomegaly, leukocytosis, and left pleural effusion [3]. However, most cases present with a wide range of clinical manifestations. Considering the variable and indeterminate clinical presentations of SA, presumption of SA is essential to make the diagnosis in a patient with IE [3]. An enhanced CT is the most useful imaging tool with a high sensitivity and specificity for the diagnosis of SA. Nevertheless, the differentiation between splenic infarction and SA is challenging. Typically, splenic infarction appears to be peripheral, well-defined, and a wedge-shaped low attenuation area on a CT scan. The typical appearance of SA on a CT scan is as a focal low attenuation area with peripheral enhancement.

Surgical treatment is a standard therapy for cases of IE with SA. However it has not been clarified whether valve replacement should be done first. The largest clinical research published to date focused on 27 patients with IE complicated with SA, and showed that medical treatment alone resulted in a poor outcome, while treatment with splenectomy resulted in a high survival rate (17/20 patients, 85%) [4]; however this investigation was published 20 years ago. Splenectomy is thought to be essential for eliminating the potential for prosthetic valve infection after valve replacement. Splenectomy performed by laparoscopic procedure is less invasive than open surgery. However, the laparoscopic surgery requires advanced techniques and institutions that are capable of performing the procedure are limited. Regarding the order of splenectomy and valve replacement, there exist no definite rules. There are 3 ways to perform the operations: to perform simultaneously, to perform the splenectomy followed by valvular surgery, or vice versa. Each has its own problems. In the case of performing a splenectomy first, problems may be encountered with the development of an immuno-compromised condition and a tendency for bleeding, while physical stress might be considerable in cases of a double operation. If valvular surgery is done first, prosthetic valve infections might occur because of the existence of SA. A guideline states that, if possible, splenectomy should be performed before valve replacement surgery, in order to mitigate the risk of infection as a result of the bacteremia from the abscess [5]. The guideline published from the Japanese Circulation Society also recommends that splenectomy should be done prior to valve replacement (http://www.j-circ.or.jp/guideline/index.htm). However, the guideline was not supported with strong evidence.

Here, we present the findings of six reports published to date, on the outcome of patients in relation to the order of surgical therapies for IE complicated with SA [2,6—10].

Among 32 cases, 19 patients were treated with therapy preceded by splenectomy, 10 with valve surgery first, and 3 were treated simultaneously. The survival rates were 84.2% (16/19), 70% (7/10), and 100% (3/3), respectively. The order of splenectomy and valve replacement might influence the outcome. We think that more data are required to state the recommended order of operations. Our case report is clinically important as a part of evidence for successfully treating IE complicated with SA.

Conclusion

We report a case of IE complicated with SA, successfully treated by splenectomy followed by valve replacement.

References