A Surgical Case of Mitral Regurgitation due to Active Infective Endocarditis with Idiopathic Thrombocytopenic Purpura

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A 71-year-old woman with idiopathic thrombocytopenic purpura (ITP), who had been treated with steroid and cyclosporine, was admitted in an emergency with fever and dyspnea. The diagnosis was mitral regurgitation due to infective endocarditis. Although she received treatments for infection and cardiac failure, the cardiac failure could not be controlled. After high-dose γ-globulin therapy, an emergency operation was performed during the active phase of infective endocarditis. Rapid platelet transfusion was administered after weaning from extracorporeal circulation. She recovered and was discharged without postoperative bleeding and re-infection.

The treatment course of elective cardiac surgery complicated with ITP has been established, but the course of emergency surgery has not been established because of the small number of cases reported. Since few patients have undergone emergency surgery for active infective endocarditis, we had difficulty in deciding the time of surgery and treatment for increasing the number of platelets before surgery, it was considered that the case provided us with useful suggestion for the future treatment for urgent surgery complicated with ITP.

Keywords: idiopathic thrombocytopenic purpura, infective endocarditis, mitral regurgitation

Introduction

Idiopathic thrombocytopenic purpura (ITP) is an autoimmune disease defined as acquired thrombocytopenia of unknown cause.1) Strict platelet control should be started before surgery for ITP patients because thrombocytopenia is induced by cardiac surgery due to the influence of extracorporeal circulation.2) With progression of surgery method, several cardiac surgeries for patients complicated with ITP have been reported but only two cases of cardiac surgery were reported in the past for infective endocarditis complicated with ITP,3, 4) and this is the first case where the diagnosis of ITP was made before surgery and operation was performed during the active phase of infective endocarditis.

Reported here is our experience with an ITP patient who developed severe mitral regurgitation due to infective endocarditis and surgery became necessary during
the active phase of infective endocarditis because acute heart failure could not be controlled.

**Case Report**

A 71-year-old woman was admitted in an emergency to our institution with chief complaints of fever and dyspnea. Two years previously, she was admitted to the Department of Hematology and Rheumatology of our hospital because of general fatigue, blood spots on the lower limbs and thrombocytopenia (20000/µl). In a bone marrow aspiration, an increase in megakaryocytes and decrease in platelet production were observed. The PAIgG was high at 2690 ng, and ITP was diagnosed. Thereafter, treatment with steroids (prednisolone 7.5 mg/day) and cyclosporine (100mg/day) was continued. Inflammatory findings were observed by the test upon hospitalization with WBC count of 26800/µl, CRP at 12.8 mg/dl, platelet count was low at 49000/µl (Fig. 1), and BNP was high at 1408 pg/ml. Chest X-ray pictures showed marked pulmonary congestion while cardiothoracic index was increased to 60% (Fig. 2). Echocardiography showed
vegetations on the anterior/posterior mitral leaflets (anterior mitral leaflet: 15.6 × 17.4 mm, posterior mitral leaflet: 16.5 × 17.0 mm) as well as grade III mitral regurgitation (Fig. 3). After hospitalization, Staphylococcus epidermidis was detected by blood culture and Methicillin-resistant Staphylococcus aureus by sputum culture. Vancomycin was administered for the infection, and dobutamine, human atrial natriuretic peptide (hANP), and furosemide, for the treatment of cardiac failure. However, cardiac failure could not be controlled, even after that, and surgery was required. Due to lowered platelet count, a high-dose γ-globulin therapy (17.5 g/day) for 5 days was started. Aggravation of cardiac failure was observed on day 2 of treatment, but treatments to prevent cardiac failure and increase the platelet count (high-dose γ-globulin) were continued while the patient was using a ventilator, and the platelet count was increased to 100000/µl in the morning of surgery. Vegetation was attached to the entire anterior/posterior mitral leaflet, and the normal valve leaflet was not observed during surgery. However, infection was not observed on the annuli and subvalvular tissues, and an abscess was not observed either. Entire anterior/posterior mitral leaflets were resected, and MVR (mosaic valve of 25 mm) was performed (Fig. 4). Extracorporeal circulation was controlled at around 400 second to prevent an excessive increase in the active coagulation time (ACT). Rapid platelet transfusion of 50 units was administered after release from extracorporeal circulation. In a pathological examination, endocarditis associated with an abscess due to severe neutrophil infiltration was observed in both the anterior and posterior leaflets, many groups of bacteria were present and partial ulceration was found (Fig. 5). However, no abscesses were formed in the vicinity of the valve annulus. Stable hemodynamics was maintained with a low-dose dopamine, dobutamine and hANP after surgery. Post-surgery platelet count was 108000/µl and additional γ-globulin therapy or platelet transfusion was not
required, and steroid (prednisolone) at 10 mg/day was intravenously administered. On day 2 after surgery when the patient was weaned from the ventilator, bleeding from a drain was negligible and it was removed on day 3 after surgery. Oral administration of steroid (prednisolone 7.5 mg/day) was started on day 4 after surgery. Vancomycin and cefazolin were administered after surgery, and WBC count and CRP were lowered and inflammatory reaction was improved. However, postoperative administration of antibiotic for 4 to 8 weeks was recommended even after improvement of inflammation in case of surgery for infective endocarditis and treatment with antibiotics (vancomycin and cefazolin) was continued. Recurrence of cardiac failure or infection was not observed and platelet count was stabilized with treatment of steroid alone. However, the patient was transferred to a cardiac rehabilitation facility for rehabilitation purpose on day 24 after surgery because independent gait had not been possible from before surgery due to disuse atrophy. At the time of hospital transfer, WBC count was 7000/µl, CRP was 0.43 mg/dl, platelet count was 64000/µl and an infection such as regurgitation around the prosthetic valve was not detected by echocardiography, and LVEF was favorable at 60%. Treatment with vancomycin was continued also at the rehabilitation facility but it was discontinued on day 45 after surgery following normalization of CRP, and the patient was discharged on day 52 after surgery by independent gait.

**Discussion**

Surgery for infective endocarditis is usually performed after controlling the infection with antibiotics. It is, however, unavoidable to perform surgery before the infection is controlled because some patients develop complications (congestive heart failure, paravalvular infection, embolism, brain complications, etc.) during treatment with antibiotics. Congestive heart failure and embolism are the greatest predictive factors of prognosis in patients with infective endocarditis. This patient was diagnosed as congestive heart failure of NYHA Class IV with vegetations observed both on the anterior and posterior mitral leaflets, both of which exceeded 10 mm, and emergency surgery was indicated although the infection was not controlled. Prognosis of the patient was not expected without surgery although she was also in a high-risk state with cardiac cachexia and thrombocytopenia due to ITP before surgery. It was therefore difficult for us to make a judgment on the timing of surgery and whether or not to perform pre-surgery treatment for increasing platelet count.

There were some case reports of cardiac surgery in ITP patients but a compilation of 3 subjects of Mathew et al. and 20 reported case is the only collective report at one site. It is recommended to perform a high-dose γ-globulin therapy, splenectomy, and platelet transfusion prior to cardiac surgery in ITP patient to increase platelet count. Consensus has not been reached concerning the selection of therapeutic method, but surgery may be performed when platelet count is increased following various therapies in case of elective surgery for a patient with stable pre-surgery hemodynamics. Of the two cases of elective surgery performed at our department, splenectomy was performed before surgery in one patient because platelet count was not increased even after high-
dose γ-globulin therapy.14) In the other case, platelet count was increased by a high-dose γ-globulin therapy so splenectomy was performed during cardiac surgery.15) The outcome was favorable for both patients without a post-surgical decrease in platelet count or bleeding. Mathew et al. reviewed the 20 patients reported in the past, and it was reported that complications related to post-surgical bleeding were avoided by pre-surgical, high-dose γ-globulin therapy and intraoperative platelet transfusion.11) It has been reported that postoperative hemorrhages present no problem in many cases because the platelets increase preoperatively, and no problems have arisen in our experience. To what extent the platelet count increases preoperatively is important. However, some patients do have postoperative hemorrhages. In such cases, addition of platelet transfusions, addition of γ-globulin therapy or early hemostasis by repeated thoracotomy is necessary. Various therapies for increasing platelet count may be performed before surgery in case of an elective surgery. With an emergency surgery or a patient with active infective endocarditis, however, therapeutic policies such as whether to perform a pre-operative therapy for increasing platelet count or to perform surgery without a pre-operative therapy are not available and few cases have been reported. Only 2 case reports are currently available concerning the patients of infective endocarditis with complication of ITP.3, 4) One of these patients had no complication of cardiac failure and hemodynamics was stable, and a high-dose γ-globulin therapy was performed subsequent to treatment with antibiotics before elective surgery.3) In other patient who was diagnosed as ITP after surgery, emergency surgery was performed during the active phase and a sufficient quantity of platelets was transfused immediately after weaning from extracorporeal circulation.2) ACT during extracorporeal circulation was strictly controlled to prevent intra- and post-operative bleeding; and 4) a sufficient quantity of platelets was transfused immediately after weaning from extracorporeal circulation.

Number of patients should be accumulated for establishing a therapeutic policy for increasing platelet count for emergency surgery of a patient with complication of ITP, but it was suggested possible to obtain good results, based on this patient by performing surgery subsequent to a high-dose γ-globulin therapy and by performing intra-operative platelet transfusion when there is sufficient time.

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References