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Cardiac Hemolytic Anemia with Acute Renal Failure Due to Paravalvular Leakage in A Case with Prosthetic Valve Replacement

Hüseyin Altuğ Çakmak, Erkan Yıldırım, Serkan Aslan, Kahraman Coşansul, Vural Ali Vural

İstanbul University, Cerrahpasa Medical Faculty, Department of Cardiology, İstanbul

ÖZET

Mitral ve aort kapak replasmanı sonrası paravalvüler kaçağa bağlı gelişen şiddetli kardiyak hemolitik anemi ve akut böbrek yetmezliği

Protez kapağa bağlı olarak gelişen kardiyak hemolitik anemi edinsel hemolitik aneminin ender görülen nedenleri arasındadır. Protez mitral ve aort kapağı regujitasyonundaki hemoliz literatürde tanımlanmış olup mekanizması tam olarak aydınlatılamamıştır. Bu vakada mitral ve aort kapak replasmanı sonrası paravalvüler kaçağa bağlı oluşan ve akut böbrek yetmezliğinin eşlik ettiği şiddetli hemolitik anemi sunulmaktadır.

Anahtar kelimeler: Protez kapak, mitral kapak yetmezliği, hemolitik anemi, aort kapak yetmezliği, paravalvüler kaçak

ABSTRACT

Cardiac hemolytic anemia with acute renal failure due to paravalvular leakage in a case with prosthetic valve replacement

Cardiac hemolytic anemia due to prosthetic valve replacement is a rare but very important cause of acquired hemolytic anemia. Hemolysis in prosthetic mitral and aortic valve regurgitation has been recognized, but the mechanism of hemolysis following mitral and aortic valve replacement is not well characterized. We report a case of severe hemolytic anemia accompanied by acute renal failure after mitral and aortic valve replacement.

Key words: Prosthetic valve, mitral valve insufficiency, hemolytic anemia, aortic valve insufficiency, paravalvular leak

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INTRODUCTION

Cardiac hemolytic anemia due to prosthetic valve replacement is a rare but very important cause of acquired hemolytic anemia (1). Hemolysis in prosthetic mitral and aortic valve regurgitation has been recognized, but the mechanism of hemolysis following mitral and aortic valve replacement is not well characterized. Paravalvular leakage due to prosthetic valve leads to symptoms of mitral and aortic valve regurgitation. Definitive diagnosis of this condition is established by the paravalvular leakage seen on echocardiography and by the numerous schistocytes seen in the peripheral blood smear (1).

We report a case of severe hemolytic anemia accompanied by acute renal failure after mitral and aortic valve replacement.

CASE REPORT

A 48 year old woman was admitted to our clinic with one week history of fever, nausea, vomiting, weakness and abdominal pain. Her past medical history was significant due to mitral stenosis that was treated by prosthetic mitral valve replacement in 1996 and aortic regurgitation that was being required to aortic valve replacement in 2006 related with acute rheumatic fever. Since her last evaluation, she has been receiving aspirin 100 mg/day, metoprolol succinate 50 mg/day, warfarine 5 mg/day.

On her physical examination, pulse rate 75/min, blood pressure 80/60 mmHg, 4/6 systolic murmur in mitral focus that was radiated to the left axilla, 3/6 diastolic murmur

Yazışma adresi / *Address reprint requests to:* Hüseyin Altuğ Çakmak İstanbul University, Cerrahpasa Medical Faculty Department of Cardiology, İstanbul

Telefon / *Phone:* +90-533-328-6329

Elektronik posta adresi / *E-mail address:* altugcakmak@hotmail.com

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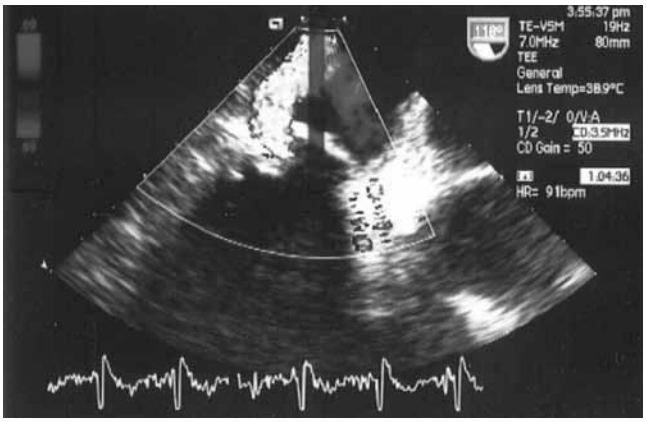

Figure 1: Transesophageal echocardiography revealed moderate to severe paravalvular leakage from prosthetic mitral valve

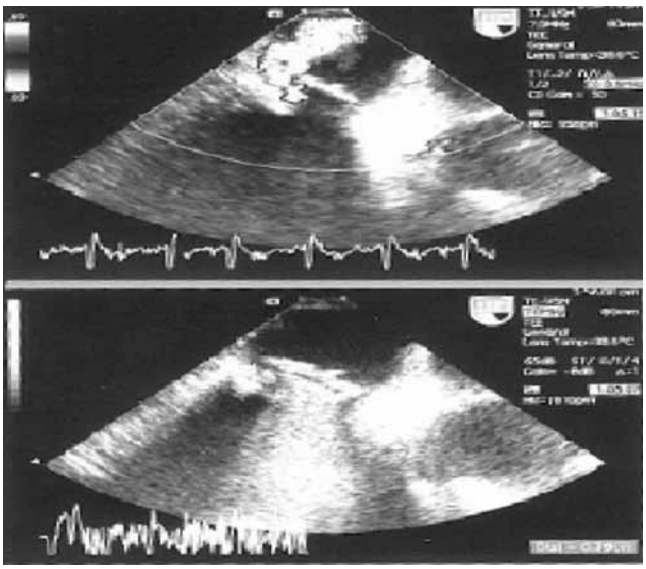

Figure 2: Transesophageal echocardiography revealed moderate to severe paravalvular leakage from prosthetic mitral valve

in aortic focus were found. Laboratory findings were as follows: Leucocytes: 53580/mm^3, hemoglobin: 7.3 gr/dl, hematocrit: 22.3%, MCV: 94.5, platelet: 509000/mm^3, urea: 84 mg/dl, creatinine: 2.05 mg/dl, AST: 53 U/L, indirect bilirubin: 1.51 mg/dl, indirect coombs: ++, direct coombs: negative, lactate dehydrogenase (LDH): 1119 U/L, reticulocyte: 4.2%, haptoglobuline: < 31.5 mg/dl, CRP: 144 mg/dl. While a PT, aPTT, fibrinogen, D-Dimer levels were elevated, urine urobilinogen was normal but hematuria was found. Peripheral blood smear showed numerous schistocytes. Transesophageal echocardiography revealed moderate to severe paravalvular leakage from prosthetic mitral valve (Figure 1-2). The patient was consultated with haematology department for this severe hemolytic anemia and it was thought that paravalvuler leak seen on transesophageal echocardiography might lead to this severe condition. Abdominal CT showed splenic infarction. Since, blood cultures were negative and there was no marked vegetation on mitral valve, she was diagnosed as a indetermined culture negative mitral prosthetic valve endocarditis with her medical history, physical examination and echocardiographic and radiologic findings. Vancomycin, gentamycin, rifampicine and ceftriaxone was started for her urinary tract infection and infective endocarditis. While she was using her drugs, urea and creatinine levels elevated progressively. In order to prevent acute renal failure, vancomycin, gentamycin and rifampicin were stopped. Although these drugs were stopped, creatinine clearance decreased progressively below 40 mg/dL. The patient was diagnosed as an acute renal failure due to drug toxicity with these findings and she underwent dialysis four times totally for her condition. Five unit erythrocyte suspension was given for her haemoglobin levels which was between 5.5-6 gr/dl. After being dialysis and medicated by erythrocyte, her renal functions and biochemical parameters returned to normal ranges. Bioprosthetic heart valve replacement was recommended and she was send to the cardiothoracic surgery department for this operation.

DISCUSSION

Infection, hemorrhage, tromboembolic events, valve dysfunction and hemolysis are very common complications seen after prosthetic valve replacement (2). The most common reasons of paravalvular leakage are annular calcification, infection, disproportion between annulus and prosthesis, extensive tension over sutures or annulus, poor suture technique, poor fibrous tissue production or anomalies of the annulus (3,4,5). Paravalvular leakage in mitral valve occurs generally around commissures and posterior annulus even though it occurs rarely in anterior area near to aorta (6,7). In our case paravalvular leakage existed from posterior annulus. The most common causes of the posterior paravalvular leakage are less expansion of anterior annulus due to attachment of anterior annulus to fibrous trigone, double sized area of posterior annulus compared with anterior and detachment of suture lines due to annular expansion of posterior and commissural region (2).

Severe hemolysis associated with paravalvular leakage may cause acute renal failure due to tubulopathy or acute tubular necrosis (8). In our case, the cause of acute renal failure was drug toxicity which was given for infective endocarditis. The event that lead to hemolysis, recruit spontaneously but in acute period, bedrest is recommended to avoid hemolysis. Additional treatments of this condition are oral iron supplement and erythrocyte suspension but in most cases surgery is needed to correct anemia and serious hemolysis in patient with paravalvular leakage due to prosthetic valve replacement. In our case, erythrocyte suspension was given for her severe hemolysis and she underwent dialysis for acute renal failure that was caused by drug toxicity.

In the patient described above, direct relationship between paravalvular leakage from mitral prosthetic valve and concomitant infective endocarditis was observed and severe hemolysis requiring erythrocyte replacement was discussed. Physicians should be aware of such complications and concomitant diseases of prosthetic valve replacement in order to diagnose it early and treat it properly.

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