SURGICAL TREATMENT OF INFECTED PDA

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The first case was a 2.5 year old girl where echocardiography revealed vegetations in the PDA. A left thoracotomy was done and the infected PDA was closed with double ligation technique. The second case was a 28 year old woman, in whom multiple vegetations inside the pulmonary artery and a large vegetation at the pulmonary valve were detected by echocardiography. After one month duration of medical treatment,fever of the patient fell to normal and vegetations inside the pulmonary artery disappeared. However the large vegetation at the pulmonary valve was seen to be maintaining at the same size. The patient was taken to the open heart surgery to prevent the potential risk of pulmonary embolism. The vegetation at the pulmonary valve was removed and ligation was performed to the PDA. Both patients were discharged from the hospital uneventfully, and are found to be asymptomatic during the longterm follow-up period.

Key Words: PDA, infective endocarditis, echocardiography, pulmonary embolism, open heart surgery.

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Bacterial endocarditis is one of the serious potential complications of PDA. PDA endocarditis is frequently seen in young adults, and rarely in children. Bacterial endocarditis effects mostly small-sized PDA. This effect is lower at moderate-sized PDA and the lowest when the PDA is large[3].

In the preantibiotic years, infective endocarditis was responsible for about 45 % of deaths in patients with surgically untreated PDA[3]. The first successful surgical treatment of the infected PDA was reported by Touroff and Vessel in 1940[6]. After that, a few number of cases were reported[1,5,7,8].

Nowadays, PDA endocarditis is seen infrequently.Most of the cases are successfully treated with appropriate antibiotics. Surgical treament is only performed when the antibiotics are insufficient to control the infection,the vegetations continue to grow up,or in the risk of systemic or pulmonary embolism.

CASE ONE

A 2.5 years old girl was admitted to the hospital with complaints of fever,weight loss and malaise. The patient had fever since ten days and received an randomized medical treatment at a suburban hospital. Physical examination revealed 38.7° fever, heart rate was 130 per minute, and arterial blood pressure was 90/40 mmHg. A continuous

murmur which had a decreased diastolic component was heard at the second intercostal space below the left clavcicula, and P_2 was accentuated. The patient had hepato-spleno megaly. On the chest X-ray, the heart was globally large and vascular shadow was increased at an advanced degree. ECG showed left ventricular hypertrophy. Laboratory examination revealed a hemoglobin value of 9.2 g/dl, white cell count 11000/mm with a shift to the left, sedimentation rate 90 was mm/hour. Blood biochemistry was normal. There was no growth at the blood cultures. E Coli of 100.000 colonies was grown at the urine culture. Two-dimensional echocardiography showed a PDA with vegetations inside it.

Allthoug there was no growth at the blood cultures, infective endocarditis was diagnosed regarding to the vegetations revealed by echocardiography. Administration of crystalline penicillin G and streptomycin was started immedeatly. As the fever persisted after a week of treatment,combination was changed to amikacin and cefoperazone. At the end of the second week there wasn't any decrease in fever with this combination, either. Then, the combination was changed to vancomycin and amicacin. At the end of the third week, the fever still persisted, and surgical intervention of the infected focus was decided a posterolateral thracotomy was performed and a PDA, which was 1 cm.in diameter and 1 cm.length was closed by double ligation.Fever of the patient subsideol to normal at the 4th postoperative day. The combination of vancomycin and amikacin was continued for 15 days. The patient was discharged from the hospital at the 20th postoperative day, and she has been asymptomatic during the 5.5 years long-term follow-up.

CASE TWO

A 28 years old female patient was admitted to the hospital with fever and dyspnea for 15 days. On the physical examination, the patient had fever, 39.2° degrees. Heart rate was 120 per minute. Blood pressure was 120/80 mmHg. On cardiac auscultation; accentuated P_2 and a continuous murmur was heard at the second intercostal space below the left clavicula. There was pitting pretibial edema on the both legs. Chest X-ray revealed an and enlarged heart, and large central pulmonary arteries.ECG revealed left ventricular hypertrophy.

Laboratory examination resealed hemoglobin value of 8.1 g/dl,white cell count 14000/mm^3 with a shift to the left, sedimentation 120 mm/hour, urea 72 % mg, kreatinin 2.1 % mg. Three blood cultures grew Streptococcus viridans. Two-dimension echocardiography revealeda PDA, a large pedunculated vegetation at the pulmonary valve, and multiple small vegetations inside the pulmonary artery (Fig. 1). According to these findings the diagnosis of infective endocarditis with cogestive heart failure was accepted.

Sulbactam + Ampicillin and amicacin was administrated together with treatment of congestive heart failure. The patient responded well to the treatment and the fever fell to normal at the fifth day. The antibiotic combination was continued for one month. At the end of first month control echocardiography showed that the vegetations in the pulmonary arter totally disappeared but the large pedunculated vegetation at the pulmonary valve remained at the same size (Fig.2). Open heart surgery was decided to prevent the potential risk of pulmonary embolism. The large pedunculated vegetation at the pulmonary valve was removed through the vertical pulmonary arteriotomy. There wasn't any growth at the vegetation culture. The patient had an unevent full postoperative period. The PDA was closed under cardiopulmonary bypass. Standart bypass tech-niques were established. The PDA had a thick wall with 1x1 cm dimensions. The ductus was closed by double ligation technique. Antibiotic administration was continued for one week after the operation. There was no growth in separate blood cultures taken at the end of the antibiotic therapy. The patient was discharged at 12th postoperative day with a good health and she was asymptomatic at postoperative fourth month.

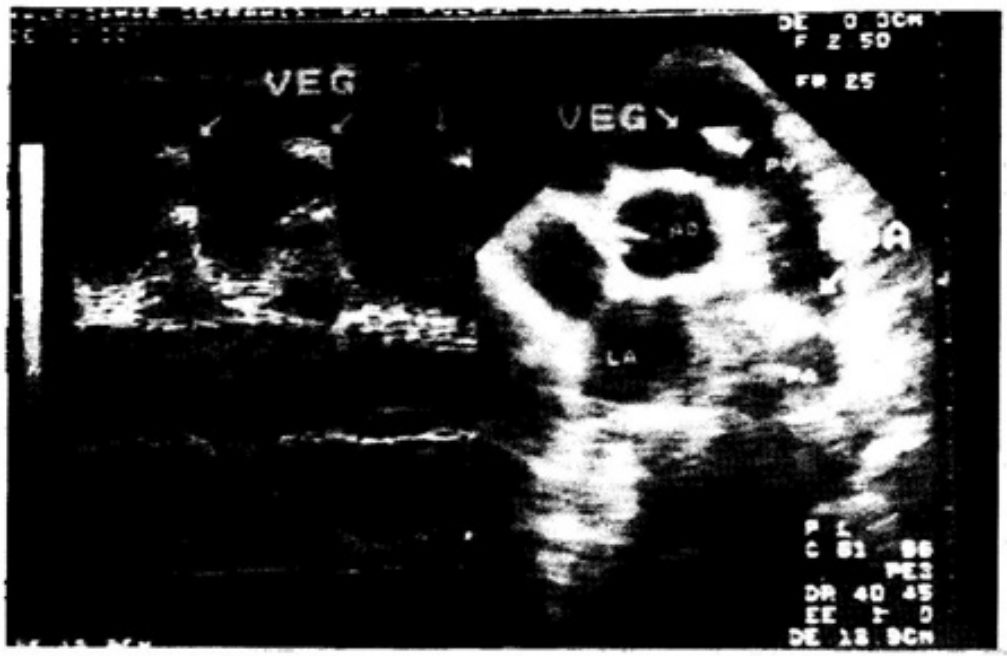

Figure 1: *The two-dimensional echocardiography of case II illustrating the large pedunculated vegetation at the pulmonary valve and multiple small vegetations inside the pulmonary artery.*

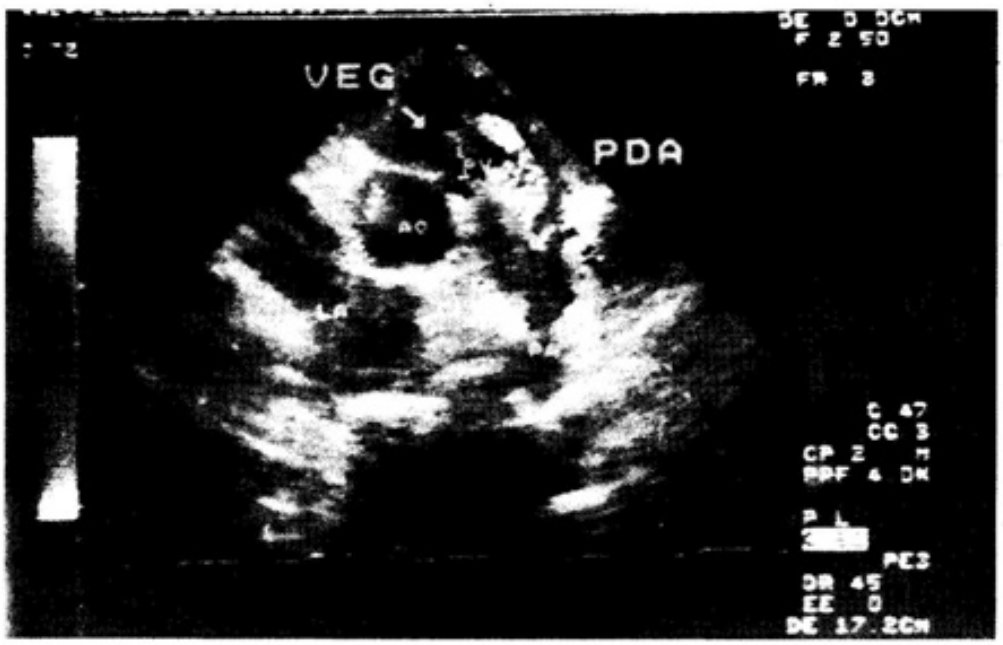

Figure 2: *The two-dimensional echocardiography of case II which was taken at the end of one month of antibiotic therapy illustrating that the multiple small vegetations inside the pulmonary artery were lost but the large pedunculated vegetation at the pulmonary valve was still in the same size.*

DISCUSSION

In PDA the risk of developing infective endocarditis is approximately one in every 300 patients years[2]. Endocarditis develop on ductus walls and on its pulmonary end. Jet flow inside the ductus may cause lesions at the main pulmonary artery and pulmonary valve. Endocarditis is seen in the pulmonary artery, and pulmonary valve in the presence of these le-

sions[7]. Our second case is an example of this kind. Similarly, Nakamura and Touze reported isolated pulmonary valve endocarditis with a PDA, and also Chia reported pulmonary artery vegetetions with a PDA[1,4,7].

When medical treatment fails, surgical treatment is the choice of treatment in PDA endocarditis. Cases having embolic episodes or large vegetations which may have serious risk of pulmonary embolism are also candidates to surgical therapy.

Different techniques have been used for the surgical treatment of infected PDA. Among these are ligation, division, closing the ductus from inside of the pulmonary artery or division using cardiopulmonary bypass. Repair of the ductus using cardiopulmonary bypass is generally performed in, cases with pulmonary artery or valve vegetations. In this situation, vegetations at the pulmonary valve or artery are removed and the ductus is closed using sutures from inside of the pulmonary artery, or by external ligation. Stejskal described a method of division using cardiopulmonary bypass for removal of an isolated vegetation at the pulmonary arterial wall[5]. Simple division is preferred to decrease the risk of bleeding in the cases having fragile ductus wall.

In the first case, the ductus wall was thick enough to perform double ligation. In the second case, we had to operate the patient using open heart surgery to remove the vegetation at the pulmonary valve. Also, in this case ductus wall was approved for ligation, so ligation was performed.

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