A 50-year-old female was admitted to Pusan National University Hospital with complaints of fatigue and sweating. Echocardiography showed a small patent ductus arteriosus (PDA) and highly mobile vegetations on the aortic valve. Emergency operation was performed due to the high risk of embolization and severe aortic regurgitation. When the pulmonary artery opened, we found unexpected fresh vegetation. The tissue of the PDA was fragile and infected. We successfully removed the infected tissue, closed the PDA with a patch, and replaced the aortic valve with a mechanical prosthesis.

Key words: 1. Endocarditis
2. Congenital heart disease (CHD)
3. Aortic valve

CASE REPORT

A 50-year-old female presented to Pusan National University Hospital with a 1-month history of fatigue, loss of weight, and shortness of breath. She had poor oral hygiene and a low socioeconomic status. Her medical history was unremarkable. On examination, she presented with fever and sweating, along with marked conjunctival pallor. There was a continuous murmur with thrill over the pulmonary area and a diastolic murmur over the aortic area. Chest radiography showed bilateral lower lobe infiltrates and mild cardiomegaly (Fig. 1A). On a chest computed tomography (CT), pulmonary edema and multiple cavitary lesions, which were surrounded by ground-glass opacity suspecting septic emboli, were observed (Fig. 1B). Splenic infarction was detected on the abdominal CT (Fig. 1C). No brain lesion of septic emboli was described in the brain magnetic resonance imaging. Laboratory investigations were remarkable for anemia and leukocytosis. Transthoracic and transesophageal echocardiography revealed severe aortic valve regurgitation, with highly mobile masses on the right and the left coronary cusps, which were irregularly thickened and prolapsed. Continuous shunt flow, from the descending aorta to the pulmonary artery, was noted (Fig. 2). The defect size was 6 mm, and the amount of shunt flow was too small to measure. Pulmonary hypertension was not suspected because the pressure and the morphology of the right ventricle remained normal. Other cardiac valves, including the pulmonary valve, were normal, and no other vegetation was observed on the chambers and the great vessels.

Emergency operation was carried out due to highly mobile
vegetation and severe aortic regurgitation. The patent ductus arteriosus (PDA) was isolated and identified primarily. Cardiopulmonary bypass (CPB) was commenced with aortic and bivacal cannulation. With external ligation of the duct, the patient was then cooled to a temperature of 28°C, after which the pulmonary artery was opened. Unexpected fresh vegetation was found in the pulmonary artery, at the site opposite to the ductal opening (Fig. 3A). Blood flow was still present despite the earlier ligation. With total circulatory arrest, the pulmonary artery opening of the duct was identified. As the tissue of the ductus was infected, and thus, fragile, the ductus was removed completely. A fresh pericardial patch was used to close the opening of the aortic wall. All vegetations on the pulmonary artery were debrided and removed, and the defect of pulmonary artery was repaired directly. The aortic valve was severely destructed with a large number of
mobile vegetations. All infected tissue, including the valve, was resected and replaced with a mechanical prosthetic valve (Fig. 3B). Bacterial culture revealed Streptococcus mutans. After six weeks of penicillin injection, infection was controlled completely, including that in the lung and the spleen. In the 1-year follow-up, no recurrence was observed.

**DISCUSSION**

The risk of infective endocarditis (IE), with a small PDA in adults, appears to be extremely low. Nowadays, IE has become treatable with advanced antibiotics. Despite appropriate medical treatment, IE occasionally needs surgical treatment [1]. However, there is little experience of surgical treatment [2].

According to the previous reports, open closure with CPB, rather than ligation, was strongly recommended, as a surgical intervention of PDA in adults, due to the risk of severe hemorrhage from the fragile ductal tissue. The risk of hemorrhage is considerably higher when combined with endocarditis, in particular [1]. In addition, considering pulmonary embolization from the dislodgement of vegetation and the incomplete elimination of infective foci, complete resection of PDA and closure, under direct vision, was strongly suggested [3]. Infected emboli are common, and the frequently involved site is the pulmonary arterial wall, opposite to the opening of PDA [3-5]. To suspect the possibility of embolic vegetation on the pulmonary artery is reasonable, even if vegetation is preoperatively noticed only on the left side valve, as in our case. In conclusion, inspection inside of the pulmonary artery is essential for a complete removal of the infected material and for ensuring the safety of closing the PDA with endocarditis in adult patients.

**CONFLICT OF INTEREST**

No potential conflict of interest relevant to this article was reported.

**ACKNOWLEDGMENTS**

This work was supported by the year 2014 clinical research grant from Pusan National University Hospital.

**REFERENCES**

1. Fortescue EB, Lock JE, Galvin T, McElhinney DB. To close or not to close: the very small patent ductus arteriosus.
2. Ryu DW, Lee SY. Infective endocarditis with patent ductus arteriosus at 60 years old patient. Korean J Thorac Cardiovasc Surg 2010;43:89-91.
3. Kareem BA, Kamarulzaman H, Koh GT. Surgical management of patent ductus arteriosus with endocarditis. Ann Thorac Surg 2010;90:1703-5.
4. Cagli K, Basar FN, Cagli K, et al. Multisite infective endocarditis/endarteritis in a young peripartum patient with patent ductus arteriosus and rheumatic heart valve disease: a case report. Echocardiography 2010;27:466-9.
5. Aggarwal SK, Barik R. Infective endocarditis of a patent arterial duct in an adult, with vegetations extending to the aortic and pulmonary valves. Cardiol Young 2007;17:565-6.