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Case Report:

Aorta-to-right atrium fistula, an unusual complication of endocarditis

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Abstract: Infective endocarditis (IE) remains a serious disease. Aorta-to-right atrium fistula is a rare but very serious complication of IE and predicts a higher mortality. This report describes a 50-year-old man with endocarditis, vegetation, perforation of noncoronary sinus, and formation of two aorta-to-right atrium fistulas with native valves detected by transthoracic echocardiography. This disease is lethal despite developments in cardiac imaging and antibacterial therapy. Early diagnosis, aggressive antibacterial therapy, and surgical treatment may improve the prognosis.

Key words: Infective endocarditis (IE), Aorta-to-right atrium fistula, Echocardiography
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INTRODUCTION

Infective endocarditis (IE) remains a serious and even a life-threatening disease with substantial morbidity and mortality. Systemic embolization, central nervous system events, heart failure, and intracardiac abscess formation are common complications (Moreillon and Que, 2004). Bacterial invasion at the periannular level causes tissue weakening, necrosis, and subsequent formation of periannular complications such as development of an intracardiac fistula (Anguera *et al*., 2005b). We describe a patient with formation of two fistulas between aorta and right atrium due to IE.

CASE REPORT

A 50-year-old man who had a history of hypertension and diabetes mellitus and presented with dyspnea, high-grade fever, weakness and chest pain was referred to our hospital. He denied any recent soft tissue infection and surgery. In physical examination, his temperature was 39.5 °C, blood pressure 95/50 mmHg, heart rate 120 times/min, and respiratory rate 23 times/min. A grade of 3/6 continuous murmur was heard on the left sternal border. Laboratory investigations revealed anemia (7.1 g/d), leukocytosis (19000 mm^{-3}), and increased erythrocyte sedimentation rate (80 mm/h). Serum chemistry and urine analysis were normal. Antihuman immunodeficiency virus was tested negative. The electrocardiography (ECG) revealed sinus tachycardia and T wave inversion. Chest X-ray showed increasing of lung markings and pleural effusion in both sides of the chest. Transthoracic echocardiography showed tricuspid aortic valve, severe aortic valve stenosis, and several vegetative masses on the left and right leaves of the aortic valve (Figs.1a and 1b), tricuspid valve and right side of inter-ventricular septum (Figs.1b and 1c). There were two echo-free spaces in the noncoronary sinus (Fig.1d). Color Doppler revealed two fistulas between the aortic lumen and right atrium (Fig.2). The cardiac function reduced and the left ventricular ejection fraction was 45%. Five separate blood samples were drawn for culture, each 1 h apart. As all cultures remained negative, the patient was accepted as culture negative endocarditis.

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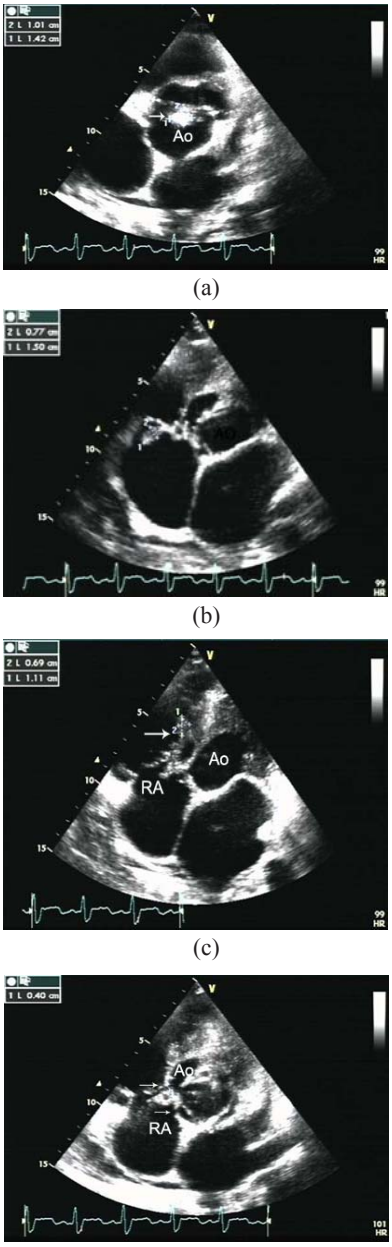

(a)

(b)

(c)

(d)

Fig.1 Two-dimensional echocardiograms of parasternal short axis view demonstrating vegetative mass on the aortic valve (a), vegetative mass on the aortic valve and right side of inter-ventricular septum (b), vegetative mass on tricuspid valve and right side of inter-ventricular septum (c), and two echo-free spaces in the noncoronary sinus (d)

The patient was treated with intravenous oxacillin, ampicillin, and gentamincin. An operation had been denied by the surgeon due to worsening of his general condition and the patient died of congestive heart failure 3 weeks later.

Fig.2 Color Doppler demonstrating two blood flows between the aortic lumen and the right atrium

DISCUSSION

Despite improvement in health care, the incidence of IE has not changed over the past two decades (Hoen *et al*., 2002; Moreillon and Que, 2004). The risk factors include rheumatic heart disease, congenital heart disease, intravenous drug use, sclerotic valve disease in elderly patients, use of prosthetic valves, and nosocomial disease (Moreillon and Que, 2004). Developments in antibacterial therapy, clinic microbiology, cardiac imaging, and cardiac surgery have revolutionized diagnosis and prognosis of IE. The mortality rate still hovers at almost 40% of the disease (Moreillon and Que, 2004; Bashore *et al*., 2006). Male gender, old age (≥50 years), diabetes mellitus, renal insufficiency, staphylococcal species, heart failure, acute neurologic complications, respiratory failure, and shock status were independent predictors of in-hospital mortality of IE (Lee *et al*., 2007).

Annular absecess accounts for 10%~15% complications of IE (Bashore *et al*., 2006). Extension of infection from valvular structures to surrounding perivalvular tissue may result in intracardiac abscess formation and communicate with the lumen of the aorta or the cardiac chamber. Aorta-to-right atrium fistula is a rare complication of IE and predicts a higher mortality and a greater urgency for surgery. Transthoracic and transesophageal echocardiography detected fistulous tracts in 53% and 97% of cases, respectively (Anguera *et al*., 2005a). The hemodynamic deterioration caused by aorta-to-right atrium fistula and annular abscesses increases the technical difficulties and risks associated with surgical treatment.

This case presents a rare but extremely serious

complication of IE with native valve. This disease is lethal if the patient is not aggressively treated with antibiotics alone or combined with a surgery (San Román *et al*., 2008). Early diagnosis, aggressive antibacterial therapy, and surgical treatment may improve the prognosis.

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