Case Report

Septic embolization of left and right coronary arteries resulting in sudden death: A rare complication of infective endocarditis

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ABSTRACT

Bacterial endocarditis gives rise to a variety of complications due to local tissue damage, immunological phenomena, and embolic phenomena. Only a small number of cases of coronary embolization have been reported in infective endocarditis patients. This is a case of subacute bacterial endocarditis in a postpartum mother complicated by fatal left and right coronary artery embolization. A 32-year-old postpartum mother with a history of rheumatic heart disease presented with a history of fever, shortness of breath, and bilateral ankle edema for 1-week duration. On admission, the patient was alert, febrile with a pulse rate of 90 beats/min, blood pressure 105/70 mmHg, and her lungs were clear. Transthoracic echocardiography revealed vegetations attached to both mitral and aortic valves. She was started on intravenous antibiotics. Her fever was settled and during the following 2 weeks she was clinically improving with settling inflammatory markers. On the 20th day of the illness, the patient developed sudden onset of chest pain, dyspnea with sinus bradycardia, and later developed pulseless electric activity. She expired despite intense cardiopulmonary resuscitation. Postmortem revealed multiple vegetations in both mitral and aortic valves and complete occlusion of both left and right coronary ostia by embolized vegetative materials.

<Learning objective: Subacute bacterial endocarditis with large and mobile vegetations can give rise to embolization. Although most of them cause peripheral embolization, there is a possibility of fatal coronary embolization. This case highlights the importance of early surgical intervention in bacterial endocarditis with large, multiple, and mobile vegetations even though the patient is responding to the antibiotics.>

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Introduction

Bacterial endocarditis is the endovascular infection of cardiovascular structures including atrial, ventricular endocardium, and cardiac valves. It is usually the consequence of two factors: presence of abnormal cardiac endothelium and the presence of bacteria in the blood stream [1]. In Sri Lanka, still the most common predisposing factor is rheumatic valvular disease. Bacterial endocarditis gives rise to a variety of complications due to local tissue damage, immunological phenomena, and embolic phenomena. Although peripheral embolization due to endocarditis is relatively common, only a small number of coronary artery embolization cases have been reported. This is a case of subacute bacterial endocarditis in a postpartum mother having complications of fatal left main and right coronary artery embolization.

Case report

A 32-year-old postpartum mother with a history of rheumatic heart disease was transferred from a peripheral hospital with a
history of fever, shortness of breath, and bilateral ankle edema of 7 days duration.

She delivered a baby by vacuum delivery 2 weeks previously under the cover of bacterial endocarditis prophylaxis which was complicated with postpartum hemorrhage requiring three packs of red cell transfusion. The antenatal transthoracic echocardiogram at a period of amenorrhoea of 37th week revealed grade 2 mitral regurgitation, mild aortic stenosis, and grade 1 aortic regurgitation without any vegetations.

On admission, the patient was alert, febrile, with no respiratory distress, and there was mild ankle edema. Cardiovascular examination revealed a pulse rate of 90 beats/min and blood pressure was 105/70 mmHg with a systolic murmur at apex and her lungs were clear.

Transthoracic echocardiography at admission revealed left ventricular end-diastolic dimension of 52 mm, left ventricular end-systolic dimension of 34 mm, with ejection fraction of 56%. Left atrial diameter was 43 mm. There were suspicious oscillating masses attached to both mitral and aortic valves. It further revealed a large vegetation attached to the left coronary cusp of aortic valve measuring 2.2 cm × 0.9 cm just above the aortic valve prolapsing through aortic valve to left ventricular outflow tract (Fig. 1; Videos 1 and 2). Another vegetation of dimension 1.4 cm × 0.9 cm was identified on mitral valve attached to the anterior mitral leaflet (Fig. 1; Video 1). She had grade 2 aortic regurgitation, grade 2 mitral regurgitation, and tricuspid regurgitation with a peak pressure gradient of 30 mmHg. But her blood cultures were negative probably due to previous antibiotic therapy by a general practitioner. Her erythrocyte sedimentation rate was 58 mm in 1st hour and C-reactive protein was 16 mg/L.

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She was started on intravenous gentamicin 60 mg eight hourly and intravenous crystalline penicillin 4 million units six hourly. Her fever was settled 5 days after starting the antibiotics. During the following 2 weeks she was clinically improving with settling inflammatory markers and white blood cell counts.

On the 20th day of the illness, the patient developed sudden onset of chest pain, dyspnea, and faintness while she was walking inside the ward. On examination she was dyspneic, heart rate was 30 beats/min with feeble pulses and cold peripheries. Initially, the electrocardiogram showed sinus bradycardia and later developed pulseless electric activity. She expired despite intense cardiopulmonary resuscitation for 60 min. A postmortem pathological examination revealed both mitral and aortic valves were slightly thickened with multiple medium-to-large vegetations (Figs. 2 and 3). The left main coronary artery was completely occluded (Fig. 4). The right coronary ostium was also completely occluded. Histology confirmed left main arterial occlusion by an embolic vegetation (Fig. 5).

Discussion

Bacterial endocarditis gives rise to a variety of complications due to local tissue damage, immunological phenomena, and embolic phenomena. Although peripheral embolization due to endocarditis is relatively common, only a small number of cases of coronary embolization have been reported.

Three similar case reports were found in the literature where occlusion of the left main coronary ostium by a large vegetation caused sudden cardiac death [2–4]. Another fatal left main coronary artery embolization was reported by Shamsham et al. [5] following cardiac catheterization in a patient with infective endocarditis. There were only two reported cases where aortic valve vegetation was partially occluding the left coronary ostium and both patients survived after emergency surgery [6,7].

Among the cardiac complications of infective endocarditis, the most common are heart failure and perivalvular abscess [1,8]. Mitral valve vegetations, Staphylococcus aureus infection, and paravalvular abscesses were associated with increased risk of
in-hospital deaths whereas early surgery and viridans streptococcal infection were associated with decreased risk [8].

According to the multicenter prospective European study, 34.1% of patients developed embolic phenomena of which 62% had cerebral emboli and 49% had splenic emboli [9]. Only about 1% of patients developed coronary emboli. Embolic phenomena were common among intravenous drug users with right-sided endocarditis and patients who had positive blood culture [9]. Vegetation size >10 mm, severe mobility of vegetations, and *S. aureus* and *Streptococcus bovis* infections were associated with a higher risk of embolic events [9,10]. But 20% of patients who had emboli did not have echocardiographic evidence of vegetations [11].

The best treatment modality for coronary emboli with myocardial infarction in the setting of infective endocarditis remains controversial. Prompt primary percutaneous coronary intervention is regarded as superior to thrombolysis, and is safer [11]. As the consequences of septic coronary embolus complicated with acute myocardial infarction in the setting of infective endocarditis may be fatal, early diagnosis and most likely an early surgical intervention are crucial [6,7].

**Conflict of interest**

The authors declare no conflict of interest.

**References**