

A Case report of infective endocarditic aortic valve abscess with perforation in infant

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Abstract

Background: Infective endocarditis (IE) is an uncommon but a potentially life-threatening infectious disease in children. The epidemiology of IE has changed in the past three to four decades and its incidence has been increasing recently. This case with atypical present including culture-negative and no-cardiovascular diseases got cardiovascular structural damage that deteriorate in short time.

Case presentation: This case was an infant less than one year old without basic cardiovascular disease, and this case was admitted with Kawasaki disease early. His diagnosis was infective endocarditic aortic valve abscess with perforation. The patient received intravenous injection of cefotaxime for two days and piperacillin sulbactam and cefazolin for six days. On 9th day, piperacillin sulbactam combining with vancomycin were used. On 10th day, the patient was sent to cardiac surgery department to receive aortic valve repair. The operation is successful. The abscess cavity of the inferior aortic valve and the vegetations on the aortic valve were completely removed, the left coronary valve was removed, and the left coronary valve was locally widened by autologous pericardial patch.

Conclusions: Infective Endocarditis in children may be difficult to diagnosis and manage. and the

treatment are becoming a new challenge for conventional antibiotic therapy. Some IE require serial follow-up to determine potential need for subsequent cardiovascular surgery (CVS) intervention despite microbiologic cure with antimicrobial therapy.

Key words: Infective endocarditis ;Aortic Valve Abscess with Perforation

Background

Infective endocarditis (IE) is an uncommon but a potentially life-threatening infectious disease in children. The epidemiology of IE has changed in the past three to four decades and its incidence has been increasing recently. With the improved survival rates of children with congenital heart diseases and the overall decreased frequency of rheumatic valvular heart disease in developed countries, congenital cardiac diseases now represent the predominant underlying condition for infective endocarditis in children in many countries^[1]. IE with atypical present including culture-negative and no-cardiovascular diseases got cardiovascular structural damage that may deteriorate in short time ^[2]. Endocarditis in children may be difficult to diagnosis and manage. and the treatment are becoming a new challenge for conventional antibiotic therapy. Some IE require serial follow-up to determine potential need for subsequent cardiovascular surgery (CVS) intervention despite microbiologic cure with antimicrobial therapy^[3].

Case presentation

This study was approved by the ethics committee of the Chengdu Women and Children's Hospital, Sichuan, China. The patient has provided informed consent for publication of this case.

A 9-month and 8-day old boy, weighing 8kg, with unknown comorbidities presented to the Emergency Department for evaluation of intermittent fevers and red macula of 9 days duration, with dry lips and mouth, slightly chapped. he parents describe his fever as repeated fever, and denied any nausea, vomiting, diarrhea or urinary symptoms. He was admitted to hospital with the diagnosis of Kawasaki disease. The past medical history, family history and personal history were not special. Physical examination revealed a boy in consciousness, response acceptably. He was febrile with a temperature of 38.7°C, tachycardic with a heart rate of 142 beats/min, otherwise hemodynamically stable with a normal respiratory rate of 34 breaths/min and a normal blood pressure of 80/64 mmHg. His sound of breath in both lungs was rough, his neck was supple with no lymphadenopathy, his skin exam show some rash, her heart exam reveal slight murmurs, and

his abdominal exam was unremarkable. Laboratory tests revealed abnormal white cell count, mild anemia with a hemoglobin level of 78 g/dL, RF, ASO, CRP were normal, defecation, urine tetracycline and biochemical, antinuclear antibody and thyroid function were all negative, as well as myocardial injury markers were normal, BNP improved slightly. After admission, four sets of blood cultures were negative. but the blood culture of gram-positive bacteria was examined before admission.,the details were unknown. The Chest CT suggested pneumonia, B-ultrasound of the neck showed enlarged lymph nodes and no abnormality in the liver and spleen of the abdomen. After admission, five consecutive sets of electrocardiograms prompted that ST moved down and T wave was flat (Figure 1). cardiac color doppler ultrasound was performed for 3 times on the 5th day(5.13) ,the 7th day(5.17) and 9th day(5.20) after admission, respectively, 5.20 echocardiography(Figure 2). From 4 to 8 days after admission, no fever, mental state improved, moderate anemia, no rash on trunk and limbs, with strong heart sound and even heart rhythm. On the 9th day, fever again in the morning (heat peak 38.4°C)。

The patient received intravenous injection of cefotaxime for two days and piperacillin sulbactam and cefazolin for six days. On 9th day, piperacillin sulbactam combining with vancomycin were used. On 10th day, the patient was sent to cardiac surgery department to receive aortic valve repair. During the operation, we found no significant enlargement of the heart and aorta /pulmonary artery=1:1; there were vegetations on his left coronary of aortic valve; the apothegmatic cystic spaces appeared under his left coronary cusp, and left coronary perforation was so serious that aortic regurgitation appeared. The abscess cavity of the inferior aortic valve and the vegetations on the aortic valve were completely removed, the left coronary valve was removed, and the left coronary valve was locally widened by autologous pericardial patch. Blood culture was twice negative after operation. The echocardiography was reexamined after 2 weeks, 3 weeks and 4 weeks postoperatively, showing trace aortic regurgitation, cystic echo of the left coronary valve, and normal left ventricular systolic function (figure 3 and figure 4). He had received intravenous injection of piperacillin sulbactam for 4 weeks and discharged successfully.

Discussion

More than 90% of the children with infectious endocarditis have predisposing factors, Analysis of basic diseases showed that 65.7% of the children with IE had a history of congenital heart disease, most of which were ventricular septal defect and patent ductus arteriosus, while rheumatic

heart disease was no longer a common basic heart disease [4-6]. The proportion of congenital heart disease in IE children varies greatly (2%~60%) [7]. Cases without underlying heart disease or other susceptibility factors account for approximately 5%~12% [8]. Studies have shown that the pathogenesis of IE was endothelial injury caused by hemodynamic changes and bacteremia. Specific clinical manifestations are varied, usually including fever, headache, nausea, skin bleeding points. Treatment was based on the results of blood culture and drug sensitivity tests. A combination of bactericidal antibiotics was used for longer (6 ~ 8 weeks) drug therapy. (1) This case was an infant less than one year old without basic cardiovascular disease. Recurrent fever, rash and anemia occurred in the course of the disease, which were consistent with previous literature reports [9]. The diagnosis of infective endocarditis was confirmed according to the results of cardiac color doppler ultrasound and blood culture outside the hospital. The child did not find a clear pathogen and the temperature improved, but the cardiac color doppler ultrasound showed a small-medium pericardial effusion and finally abscess perforation, which indicated that the infection was out of control and a more serious sign of IE appeared. (2) For the patients with insidious infective endocarditic, whose blood culture are negative but echocardiography shows a neoplasm, it is critical to be treated by effective antibiotic timely, it can improve the cure rate of this disease, and the improved detection method may improve the positive rate of detection. The present study shows that pathological analysis of excised tissue (such as valve tissue) combined with serological analysis (PCR) can improve the sensitivity of blood culture [10]. (3) For this case, we regularly and actively observed the condition of echocardiography, timely found the abscess perforation and actively performed the removal of aortic valve vegetations. An American study suggested that early surgery can be performed safely in children with acute IE, and that early surgery is beneficial to IE management, which can improve ventricular function, improve the possibility of natural valve repair, reduce the risk of embolism and spread of late infection [11]. (4) The reason for the enlarged echo range of the aortic valve lateral flap in the postoperative children is not clear, whether the infection is still present or the cystic cavity is normal after the operation remains to be followed up. However, the postoperative temperature of the children was normal for 4 weeks after hospitalization, the blood routine showed normal inflammatory indicators, and the blood culture was negative for 2 times.

Conclusions

Recent studies show that infant patients without CHD have an increased tendency to affect IE, but some of them are not tested as congenital cardiovascular anomaly by ultrasonic cardiogram. Therefore, for IE cases with persistent fever, abnormal increase of white blood cells and CRP, routine blood culture and cardiac color doppler ultrasonography should be performed repeatedly, so as to find surgical indications earlier and improve the prognosis of children, so as to achieve early diagnosis, last but not least, the key to treatment is timely and rational use of antibiotics.

Abbreviation list

IE: Infective endocarditis; CVS: cardiovascular surgery; RF: Rheumatoid factors; CRP: C-reaction protein; ASO: Anti streptolysin-O; BNP: Brain natriuretic peptide; CHD: Congenital heart disease

Declarations

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Author contributions

Y Y and F S designed the research. M J and S Y performed Echocardiography. Y Y, F S wrote and edited the paper. All authors approved the final version.

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Ethics approval and consent to participate

No approval was required by the institutional review board at Chengdu Women's and Children Central Hospital.

Consent for publish

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Competing interests

The authors declare that they have no competing interests.

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Figure 1. ST moved down and T wave was flat

Figure 2. 1) Aortic valve changes: abscess with perforation; 2) Aortic regurgitation (minor); 3) Pericardial effusion (minor to moderate); 4) The left ventricular systolic function is decreased.

Figure 3. postoperative: 1. Trace aortic regurgitation 2. The lateral cystic echo of the aortic valve

narrowed compared with that of the anterior (2019.5.20), and left ventricular systolic function was normal.

Figure4. postoperative:1.Aortic regurgitation (mild)2.The lateral cystic echo range of the aortic valve was enlarged compared with the previous one (2019.6.8), and the left ventricular systolic function was normal.