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A Case of Infective Endocarditis and Lung Abscess Caused by Streptococcus Mitis

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Abstract: Streptococcus mitis is the common colonized bacterium in human oral cavity, skin and gastrointestinal tract. It is an opportunistic pathogen. We report a 21-year-old Chinese man with infective endocarditis and lung abscess, who had a history of antibiotics abuse and presented as fever, cough and expectoration. Echocardiography revealed a membranous ventricular septal defect of 6mm and an excrescence of 18x6mm on the tricuspid valve which presented moderate regurgitation. 64-slice computed tomography (CT) showed flaky opacities with airbags in the left lung. Blood samples was identified as Streptococcus mitis by automated bacterial identification / susceptibility analysis system. The drug sensitivity result indicated that it could resist penicillin, tetracycline, clindamycin, cefotaxime, vancomycin and erythromycin except amoxicillin, sulbactam and cotrimoxazole. After receiving the therapy of amoxicillin sodium and sulbactam sodium for a month, the lung infection had been completely absorbed in CT images and the excrescence vanished in echocardiography, with perforation changed on the tricuspid valve. The patient received surgical treatment on moderate systemic hypothermic cardiopulmonary bypass. The patient continued to take amoxicillin sodium and sulbactam sodium for 1 week and received therapy of penicillin for 5 weeks after the surgery. We tracked him for 3 years and 10 months, no complications occurred and he recovered to normal work and life.
Keywords: Infective endocarditis, Surgery, Streptococcus mitis

INTRODUCTION

Most of bacterial endocarditis is caused by *Streptococcus viridians*. *Streptococcus mitis* belonging to viridans group is a kind of normal flora in human bodies, such as oral cavity and gastrointestinal tract, which is an opportunistic pathogen.

We are reporting the case of a patient with infective endocarditis and lung abscess, who had a history of antibiotics abuse. He received surgical treatment after the control of infection through the therapy of amoxicillin and sulbactam according to the result of drug susceptibility.

CASE REPORT

A 21-year-old man, born in Guangxi and working in Guangdong, presented to our hospital after having a fever for 3 months, accompanied with cough and expectoration for 2 weeks. 3 months ago, the man got a recurrent fever of 40^0 and received a long-term use of multiple antibiotics (the specific drug name and dose are unknown) after visiting several clinics in Guangdong and Guangxi. However, his disease was not controlled. 2 weeks ago, the patient presented cough and expectoration, accompanied with hemoptysis in fresh blood clot. After hospitalization, physical examination revealed anemia. We heard wet rales in his left lung and HR108 times/minute. Besides, we discovered IV/6 systolic murmur hair samples and III/6 systolic murmur hair samples on the level of 3, 4 intercostal space of left sternal border and xiphoid respectively.

The laboratory findings showed leucocytosis with a white blood cell count of $18.71\times10^3/\mu L$; neutrophil was 83%; erythrocyte sedimentation rate was 48mm/h; C-reactive protein turned out to be 56.52 mg/L. Echocardiography revealed a membranous ventricular septal defect of 6mm and an excrescence of 18×6mm on the tricuspid valve which presented moderate regurgitation (Fig. A). The 64-slice computed tomography showed flaky opacities with airbags in left lung (Fig. B). The patient was diagnosed as congenital heart disease, ventricular septal defect, infective endocarditis, and left lung abscess.

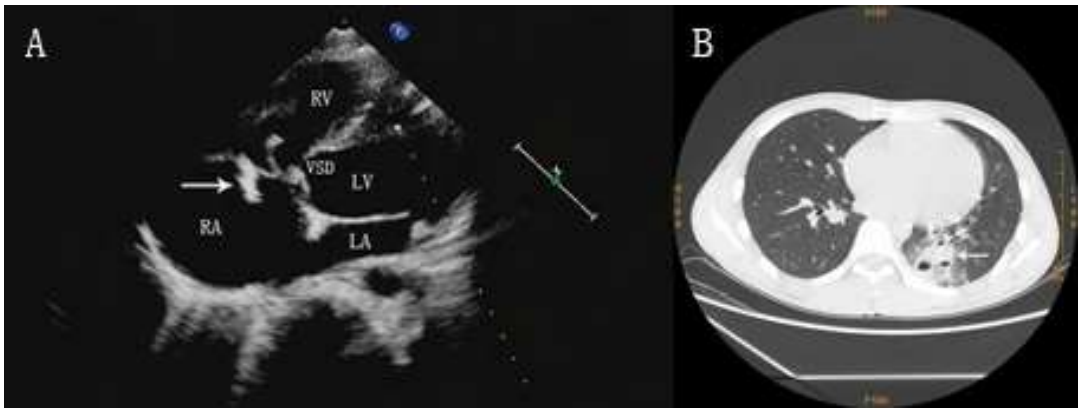

Fig. 1(A): The 4-chamber scan of echocardiography revealed membranous ventricular septal defect of 6mm and a 18×6mm vegetation was reveled on the anterior lobe of tricuspid valve. (B) The CT image showing flaky opacities with airbags in left lung.

Three days after his hospitalization, we collected his blood samples for 3 times. These samples were injected into culture bottles which were placed in automated blood culture system (BacT /ALERT 3D, Merieux France). We moved them to sheep blood agar plates when they turned into positive. 24h later, they transformed into small bacterial colonies with round bumps, smooth surface, neat edge and green blood. They turned out to be Gram-positive coccus after staining smear microscopy, presenting chain arrangement. It was identified as Streptococcus mitis by full-automatic bacterial identification / drug sensitivity analysis system (rapid ID 32 STREP, ATBTMSTREP 5, Merieux France). The drug sensitivity result indicated that it could resist penicillin, tetracycline, clindamycin, cefotaxime, vancomycin and erythromycin except amoxicillin, sulbactam and cotrimoxazole. Among the three samples, two of them were positive, presenting consistent identification conclusions.

According to the result of drug susceptibility, the patient received therapy of amoxicillin sodium and sulbactam sodium for three days and his temperature returned to normal. Blood cultures were negative a week later. After receiving the therapy of amoxicillin sodium and sulbactam sodium for a month, the lung infection was completely absorbed in CT scan and the excrescence vanished in echocardiography, with perforation changed on the tricuspid valve.

Surgical treatment was scheduled. We repaired his ventricular septal defect and molded the tricuspid valve under general anesthesia and cardiopulmonary bypass. The surgery was successful. The patient continued to take amoxicillin sodium and sulbactam sodium for 1 week and received therapy of penicillin for 5 weeks during post-operation. We tracked him for 3 years and 10 months, no complications occurred and he recovered to normal work and life.

DISCUSSION

Viridans group streptococcus is a common pathogenic bacterium of causing bacterial endocarditis. As a kind of viridans group streptococci, Streptococcus mitis is the common colonized bacterium in human oral cavity, skin and gastrointestinal tract. Without standard application of broad-spectrum antibiotics, bacterial mutation will be caused; with drug resistance, it will turn into opportunistic pathogen. When the bacteria shift, immunity of the organism decreases, or dysbacteriosis happens, infection will be caused. Infective endocarditis caused by *Streptococcus mitis* has been reported at home and abroad [1-4], but infective endocarditis merge abscess caused by *Streptococcus mitis* has not been reported before.

With extensive application of broad-spectrum antibiotics in recent years, drug-resistant strains have increased and infection rate risen. Besides, *Streptococcus mitis* can generate drug resistance more quickly than other viridans group streptococci [5-6]. In the past, penicillin was considered as the first choice of resisting streptococcus. However, *Streptococcus mitis* separated in this case can resist both penicillin and vancomycin. Appearance of this bacterial strain has reflected the serious consequence of antibiotics abuse in clinic. This patient was injected with penicillin 4 days before the drug sensitivity test result came out, but the clinical symptoms were not relieved. After the drug sensitivity test result was obtained, penicillin was replaced by amoxicillin sodium and sulbactam sodium, and the clinical symptoms were controlled rapidly.

Therefore, cardiothoracic surgeons and inspection personnel should pay enough attention to patients with infective endocarditis, especially when penicillin-resisting streptococcus is detected. The diagnostic level should be enhanced and the association must be strengthened, so as to make timely adjustment according to the drug sensitivity result, select effective antibiotics, and reasonably choose the operation time.

Such case is rare, so more experience should be summarized to gain a satisfying treatment effect.

CONCLUSION

Antibiotics are double-edged swords. Rational application of antibiotics can effectively control the infections, however, the abuse of antibiotics can lead to secondary infection. In recent years, with the more and more widespread use of broad-spectrum antibiotics, it is very necessary to comply with the use of antibiotics specifications.

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Consent

Written informed consent was obtained from the patient for publication of this paper and accompanying images.

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