




Mitral valve vegetations in a 16-year-old girl, surgically treated with minimally invasive reconstruction

Wegetacje na zastawce dwudzielnej u 16-letniej dziewczynki leczonej chirurgicznie metodą małoinwazyjnej rekonstrukcji

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Abstract

Infective endocarditis in children is a rare complication and is most often associated with dental interventions. It may develop in course of congenital and acquired heart defects, as well as previous cardiac surgeries. The case regards a 16-year-old girl reporting significant fatigue, low-grade fever, lack of appetite with a weight loss of 5 kg, apathy, and enlargement of the spleen over six months before admission. Physical examination exposed systolic murmur in the apical region. The patient was admitted to a general paediatric ward and then, after confirming vegetation on the mitral valve, further treatment was carried out in the paediatric cardiology ward. The blood cultures revealed *Streptococcus Gordonii* infection. Intensive antibiotic treatment was initiated under the control of blood cultures, which were negative after 7 days of treatment. An interdisciplinary council meeting decided to continue the treatment. Cardiosurgical consult resulted in transferring the patient to the adult cardiosurgery ward, even though she was not of age, where a minimally invasive valve reconstruction was performed using artificial tendon threads and an artificial Carpentier–McCarthy–Adams 26 mm mitral ring. The postoperative course was uneventful and the girl was returned to the care of paediatric cardiologists. Currently, she is in good condition and is under constant control.

Key words: infective endocarditis, mitral valve, valve plasty

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Introduction

Infective endocarditis (IE) is a bacterial disease that may cause the formation of vegetations on one or more valves [1–3]. The diagnosis is based on the visualization of

vegetation in echocardiography, often supplemented with computed tomography and magnetic resonance imaging [4]. Early treatment can prevent serious complications, the most dangerous of which is regurgitation and/or stenosis of one or more valves. In case of progression

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Figure 1. Echocardiographic image, left ventricular long axis. Left: on the anterior mitral valve leaflet vegetations that distort the valve (arrow). Right: massive valve regurgitation

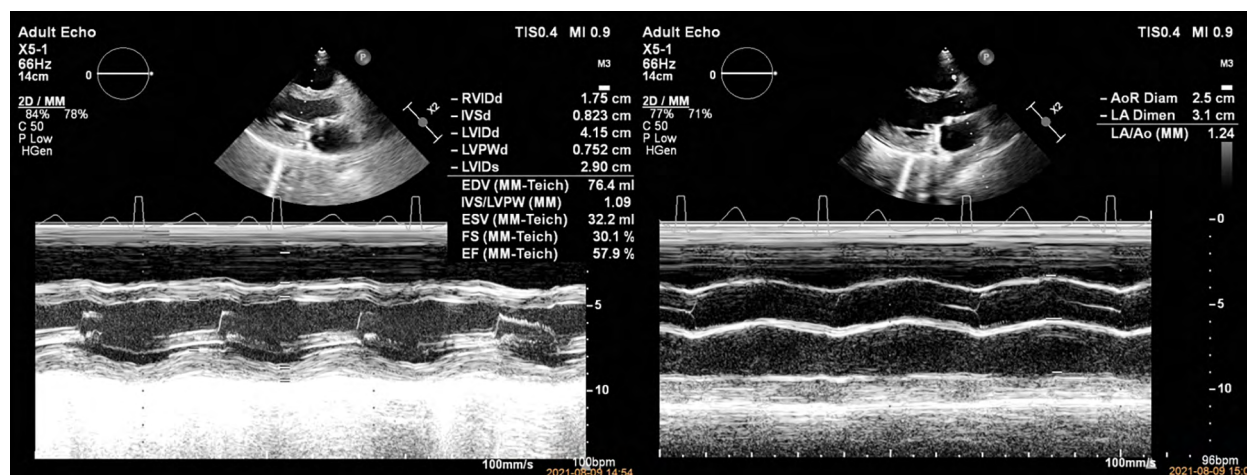


Figure 2. M-mode echocardiography. Impaired left ventricular function (ejection fraction = 57.9%) and enlarged left atrium/aorta = 1.24

surgical treatment should be considered, which should be performed by a team of highly experienced cardiac surgeons [5–7].

Case report

A 16-year-old girl was referred to the department of cardiology due to anemia, fever, fatigue, sweating, pain in the lower limbs and weight loss. Physical examination revealed a murmur in the apical region, splenomegaly, leukocytosis and increased C-reactive protein, as well as positive IgM and IgG antibodies to SARS-CoV-2. Blood cultures revealed *Streptococcus Gordonii* bacteriemia. Echocardiography showed mitral valve (MV) vegetation and a reduced left ventricular ejection fraction (Figure 1 and 2). The pharmacological therapy included cephalosporin, vancomycin,

antifungal drugs, dehydrating drugs and a convertase inhibitor. After a few days, the patient's condition improved. Transoesophageal echocardiography and three-dimensional echocardiography allowed the assessment of the valve and tendon threads (Figure 3). Although the girl was a paediatric patient, the interdisciplinary council qualified her for cardiac surgery in an adult cardiosurgery ward. This was due to the fact of the superiority of experience of “adult” cardiosurgeons in treating such an abnormality. Mitral valve reconstruction was performed, using a minimally invasive method, applying artificial tendon cords and a Carpentier–McCarthy–Adams 26 mm artificial mitral ring. The intraoperative and postoperative course was uneventful. Damaged tendon threads underwent a bacteriological examination, which came out negative. Control echocardiographic examinations showed the normal function of the reconstructed

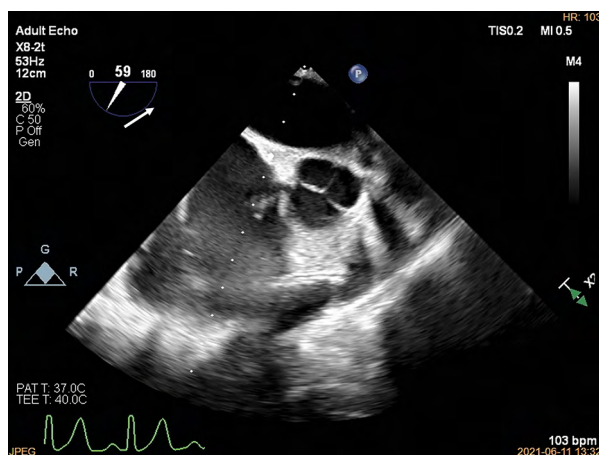


Figure 3. Transoesophageal echocardiographic image. There was no vegetation of the aortic valve (arrow), 3-leaflet aortic valve, leaflets not thickened

valve with mild regurgitation and well-preserved leaflet coaptation (Figure 4). After a week, she was referred back to the paediatric cardiology department and advised an anticoagulation warfarin treatment. Currently, the girl remains under outpatient care, in good condition, with no deviations from correct development.

Discussion

Infective endocarditis is most often of bacterial origin and is one of the most common causes of acute MV failure [1]. In some reports, the estimated annual incidence of IE is

from 3 to 9 cases per 100 000 people, 40% of which are in MV [2, 3]. The appearance of chills, fatigue, low-grade fever, lack of appetite, pale skin, splenomegaly, elevated inflammatory markers and positive blood cultures should always raise the suspicion of IE. Intracardiac vegetations, as a complication of IE, are identified by echocardiography or computed tomography, sometimes supplemented with magnetic resonance imaging [3]. They are often detected incidentally. Differential diagnostics should include blood clots and tumours. The indication for surgical treatment of IE complications is an increasing regurgitation of the valve with heart failure, as well as plastic surgery or implantation of an artificial valve into the mitral field, depending on the degree of valve damage. Valvular plastic surgery can provide better long-term survival and improved heart performance compared to valve replacement [5]. The right time for patients to undergo a correction is a matter of discussion, and the current tendency is to shorten the diagnosis-surgery period [7–10]. The present patient had a problem because she was under 18 years of age. In children, the inclusion of an experienced cardiac surgeon in the treatment team is necessary to determine the optimal surgical option. The appointed team of specialists stated that the cardiosurgery department for adults will be the best place for cardiac surgery due to the much greater experience with MV reconstruction procedures in such centers compared to children’s cardiac surgery centers. To the authors’ knowledge, the removal of vegetation from the mitral valve in a child with simultaneous plastic surgery by minimally invasive reconstruction is the first procedure of this type performed in Poland.

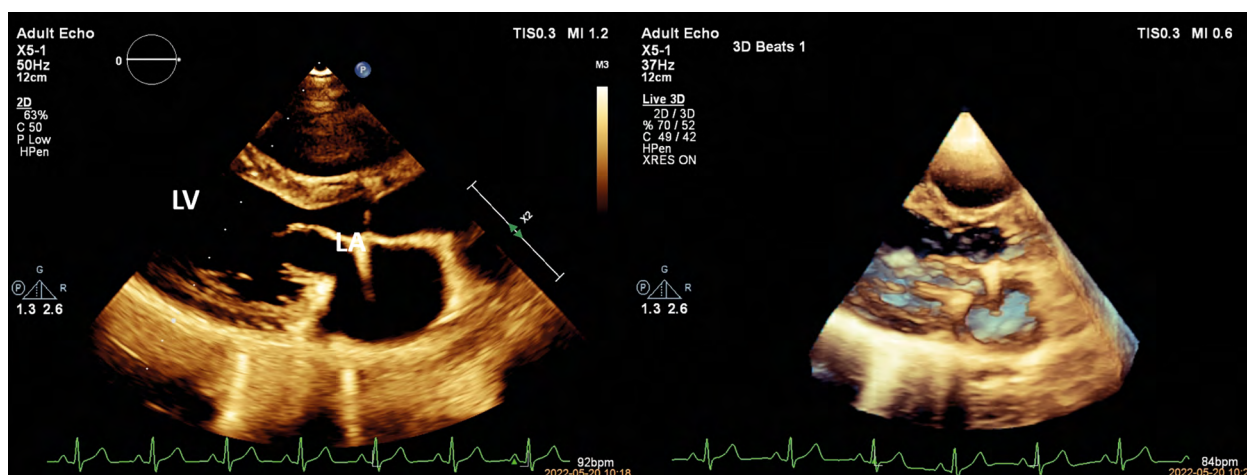


Figure 4. Image after mitral valve reconstruction. Two-dimensional echocardiography (left) and three-dimensional echocardiography (right) in the parasternal projection along the long axis of the left ventricle. Left ventricular diastolic phase. Valve leaflets open wide and flow freely into the left ventricle (LV). Enlarged left atrium (LA)

Conclusions

Clinical symptoms dominated by fatigue, low-grade fever, enlarged spleen and newly developed murmur over the heart should lead to the suspicion of IE. A damaged MV should be repaired by a highly experienced team of cardiac surgeons.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organizations that could adversely affect the content of the publication and claim the right to this publication.

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None.

Streszczenie

Infekcyjne zapalenie wsierdzia rzadko występuje u dzieci, najczęściej jest powikłaniem interwencji stomatologicznych, sprzyjają mu także wrodzone lub nabyte wady serca oraz wcześniejsze operacje kardiologiczne. U 16-letniej dziewczynki od pół roku występowało znaczne osłabienie, stany podgorączkowe, spadek masy ciała o 5 kg spowodowany brakiem apetytu, apatia i powiększenie śledziony. Pojawił się także szmer skurczowy nad koniuszkiem serca. Została przyjęta na oddział ogólnopediatryczny, po stwierdzeniu wegetacji na zastawce dwudzielnej dalsze leczenie odbywało się na oddziale kardiologii dziecięcej. W posiewach z krwi stwierdzono zakażenie *Streptococcus Gordoni* i włączono intensywne leczenie antybiotykami kontrolowane posiewami krwi, które po 7 dniach leczenia były ujemne. Powołano zespół specjalistów (*Endocarditis Team*), kontynuowano leczenie oraz wykonano echokardiografię przezprzelykową z oceną zmian na zastawce. Po konsultacji z kardiologami zdecydowano o przeniesieniu pacjentki na oddział kardiologii dla dorosłych (pomimo nieosiągnięcia wieku pełnoletniego), gdzie wykonano małoinwazyjną rekonstrukcję zastawki z użyciem sztucznych nici ścięgniętych i sztucznego pierścienia mitralnego Carpentier-McCarthy-Adams 26 mm. Przebieg pooperacyjny był niepowikłany, dziewczynkę ponownie przekazano pod opiekę kardiologów dziecięcych. Aktualnie jest w dobrym stanie i pozostaje pod stałą kontrolą lekarzy.

Słowa kluczowe: infekcyjne zapalenie wsierdzia, zastawka dwudzielna, plastyka zastawki

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