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Complications after pacemaker implantation in an 81-year-old female patient

Powikłania po wszczepieniu stymulatora serca u 81-letniej pacjentki

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Abstract

This case report presents the medical history of an 81-year-old woman with heart failure with preserved ejection fraction, sinus node disease in the form of symptomatic bradycardia, persistent atrial fibrillation, acute tricuspid regurgitation surgically repaired in 2013, and moderate mitral regurgitation. The patient had a pacemaker implanted in 1995 which was removed in 2013 due to a pacemaker pocket infection. The procedure was complicated by tricuspid valve injury. The patient underwent valve reconstruction and an epicardial DDD pacemaker implantation. The pacemaker generator was located in a space developed between the muscles and fascia of the abdominal wall. Currently, due to increasing ventricular exit block and pacemaker battery depletion, the decision was made to implant a leadless MICRA pacemaker.

Key words: pacemaker, bradycardia, epicardial DDD, leadless pacemaker, complications

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Introduction

Sick sinus syndrome is a disorder of the sinoatrial node. The condition is caused by a not fully functional pacemaker and damaged impulse transmission. It produces a variety of abnormal rhythms including bradyarrhythmias, atrial tachyarrhythmias, and "tachy-brady syndrome" [1]. The dysfunction can occur at any age but it is the most common in older age. One of 600 cardiac patients 65 years of age or older develops sinus node dysfunction [2]. The treatment of the disease can include placement of a peacemaker. Pacing for asymptomatic SND does not affect prognosis. Therefore to improve patients' live with symptomatic bradycardia due to SND, permanent pacing is considered an appropriate indication [3].

Case report

An 81-years old female patient with heart failure with preserved ejection fraction in New York Heart Association class II was admitted to the Department of Cardiology for pacemaker battery replacement and consideration of leadless pacemaker implantation. The patient reports unusual chest pain located on the right side not associated with exertion. The patient's medical history revealed sinus node disease in form of symptomatic bradycardia. In 1995, the patient underwent implantation of a VVI pacemaker but due to the pocket infection, the device was removed transvenously in 2013. The procedure was complicated by damage to the anterior leaflet of the tricuspid valve. Cardiac surgical intervention was essential to reconstruct the valve leaflet.

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Because of tricuspid valve surgery, the patient underwent implantation of an epicardial DDD pacemaker. The pacemaker generator was located in a space developed between the muscles and fascia of the abdominal wall. Due to co-existing persistent atrial fibrillation, left atrial ablation and left atrial appendage closure was performed.

On admission the patient was hemodynamically stable, blood pressure 165/105 mm Hg, heart rate 70/min, without features of pulmonary stasis. The mitral regurgitation murmur was heard. Electrocardiography showed atrial fibrillation and ventricular pacing at 70/min. Echocardiography showed moderate mitral and tricuspid regurgitation, mild pulmonary hypertension, ejection fraction of 65%, enlarged left atrium (5.4 cm), and degenerative changes in the aortic wall, and aortic valve with mild aortic regurgitation, enlarged heart cavities. In a laboratory test elevated N-terminal pro-B-type natriuretic peptide (NT-proBNP) level (1310.0 pg/mL) was observed.

The patient was consulted at a cardio group meeting where a decision to implant a leadless pacemaker MICRA was made. The course of the procedure and the perioperative period were without complications. In the control echo there was no fluid in the pericardial sac, in the chest X-ray there was no evidence of emphysema and the device was properly positioned. Follow-up in the cardiac rhyme outpatient clinic was recommended 3 months later.

Discussion

Pacemaker implantation results in an improvement of the quality of life of patients with symptomatic sick sinus syndrome [4]. Unfortunately, even in the presence of full indications for pacemaker implantation, we must take into account the possibility of complications such as therapy. Most of the complications resulting from cardiac pacing and cardiac resynchronization therapy occur in the postoperative period. In the MOST study complication rates after dual-chamber pacemaker implantation was 4.8% at 30 days, 5.5% at 90 days, and 7.5% at 3 years [5]. In this case, the pocket infection is a late complication. Such an infection more than 12 months after implantation accounts for 1.3% of complications [6]. At the same time, the patient required a pacemaker. Removal of the device resulted in damage to the tricuspid valve and its reconstruction was necessary. In a Danish population-based cohort study, complications due to pacemaker upgrade or lead revision were observed in 14,8% of patients [7]. To avoid damaging a repaired tricuspid valve or a tricuspid bioprosthesis, the optimal solution in patients needing ventricular pacing after such surgery should not include transvalvular lead implantation. Implanting a coronary sinus lead for ventricular pacing or minimally invasively placed epicardial leads is judged to be the preferred choice. After a few years due to the discharging of the device's battery and increasing ventricular maximum exit block in electrodes, the decision was made to implant a leadless MICRA pacemaker. Particularly in patients not in need of a dual-chamber device, the use of a leadless pacemaker for ventricular pacing may serve as a feasible future alternative after tricuspid valve repair or replacement.

Conclusions

This case report illustrates therapeutic challenges arising from the presence of early and late complications of medical procedures. The patient, therefore, required a non-standard procedure, i.e. implantation of a new generation leadless MICRA pacemaker. Although the decision went beyond the standards of conduct, the advantages of this approach are multiple.

Conflict of interest

The authors declare no conflict of interest.

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Streszczenie

W tym opisie przypadku przedstawiono historię choroby 81-letniej pacjentki z niewydolnością serca z zachowaną frakcją wyrzutową lewej komory, chorobą węzła zatokowego pod postacią objawowej bradykardii, utrwalonym migotaniem przedsionków oraz ostrą niedomykalnością zastawki trójdzielnej (zaopatrzoną chirurgicznie w 2013 r.) i umiarkowaną niedomykalnością zastawki mitralnej. W 1995 roku chorej implantowano stymulator serca, który następnie, w 2013 roku, wymagał usunięcia z powodu zakażenia loży rozrusznika. Zabieg był powikłany uszkodzeniem zastawki trójdzielnej. U pacjentki wykonano rekonstrukcję zastawki i implantowano nasierdziowy układ DDD z implantacją stymulatora w powłoki brzuszne. Obecnie, ze względu na narastanie progu wyjścia elektrody komorowej i wyczerpywanie się baterii rozrusznika, podjęto decyzję o implantacji bezelektrodowego stymulatora MICRA.

Słowa kluczowe: stymulator, bradykardia, nasierdziowy DDD, bezelektrodowy stymulator, powikłania

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