

PERFORATION OF RIGHT VENTRICLE BY ACTIVE FIXATION LEAD OF PERMANENT PACEMAKER - CASE REPORT

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Ventricular perforation is a rare complication of permanent pacemaker implantation. We report a case of 61-year-old woman with sick sinus syndrome who had the dual chamber pacemaker implanted. Five days after the implantation, the perforation of right ventricle by active ventricular fixation lead was detected. 12-lead surface electrocardiography and multislice chest scan are necessary for detection of rare complications after the pacemaker implantation. *Acta Medica Medianae* 2010;49(2):48-50.

Key words: active lead, permanent pacemaker, myocardium perforation

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Introduction

Ventricular perforation is a rare complication of permanent pacemaker implantation. Patients can present with different symptoms, from totally asymptomatic to serious cases of pericardium tamponade (1). In most of the cases the symptoms present within one month of implantation, while late perforation is extremely rare.

We report a case of 61-year-old woman with sick sinus syndrome who had the dual chamber pacemaker implanted. The perforation of right ventricle by active ventricular fixation lead was detected after five days.

Case report

Sixty-one-year-old patient L.J.N. was admitted to our Center for scheduled implantation of permanent pacemaker. Two months before, the patient had fatigue, especially during daily physical activities, and low heart rate. Physical examination by cardiologist indicated 24 h ECG, which showed slow heart rate (min 39, average 54) with normal AV conduction, and dual chamber pacemaker implantation was indicated. Lab results did not show any abnormalities.

Echocardiographic examination: EF 62%, normal diameter of left ventricle without wall motion abnormalities. The patient received dual the chamber pacemaker (Medtronic Sensia DR, USA) with active fixation lead (CapsureFix 5076, Medtronic,

USA) and passive atrial lead (Capsure Novus 4592 Medtronic, USA). Parameters at implantation were good. Antibiotics were administered, and the next day the patient was discharged from hospital. Five days after the implantation, the patient came to our Center due to severe pain above the left rib arch, especially on movement. Regular control of pacemaker showed the loss of ventricular capture at maximal 7.5V.

Table 1. Parameters during implantation, and after five days

Days	atrial lead			ventricular lead		
	P wave (mV)	Imp (Ω)	TR (V)	R wave (mV)	Imp (Ω)	TR (V)
0	2.6	867	0.75	16	1264	0.4
5	2.3	950	0.75	2	1134	>7.5

After recorded changes of parameters, the mode of pacemaker was changed, and AAI mode (atrium, atrium, inhibit) was reprogrammed. Echocardiographic examination showed minimal pericardial effusion 2 to 3mm in front of the right ventricle free wall. The entire system was examined by fluoroscopy and MSCT (multi slice scanner) of thorax was indicated. MSCT confirmed the rupture of the right ventricle, with the top of electrode positioned at the level of the 7th intercostal space 13mm from the free wall rib cage.

For patient safety, we decided that it was better to carry out the reposition and removal of an electrode in the center equipped for cardiac surgery. The patient was transported to the Clinical Center of Serbia, and two days after, the ventricular lead was removed. Due to normal AV conduction, the pacemaker was programmed to AAI mode. After 14 days, control echocardiography showed no pericardial effusion in front of the right ventricle wall.

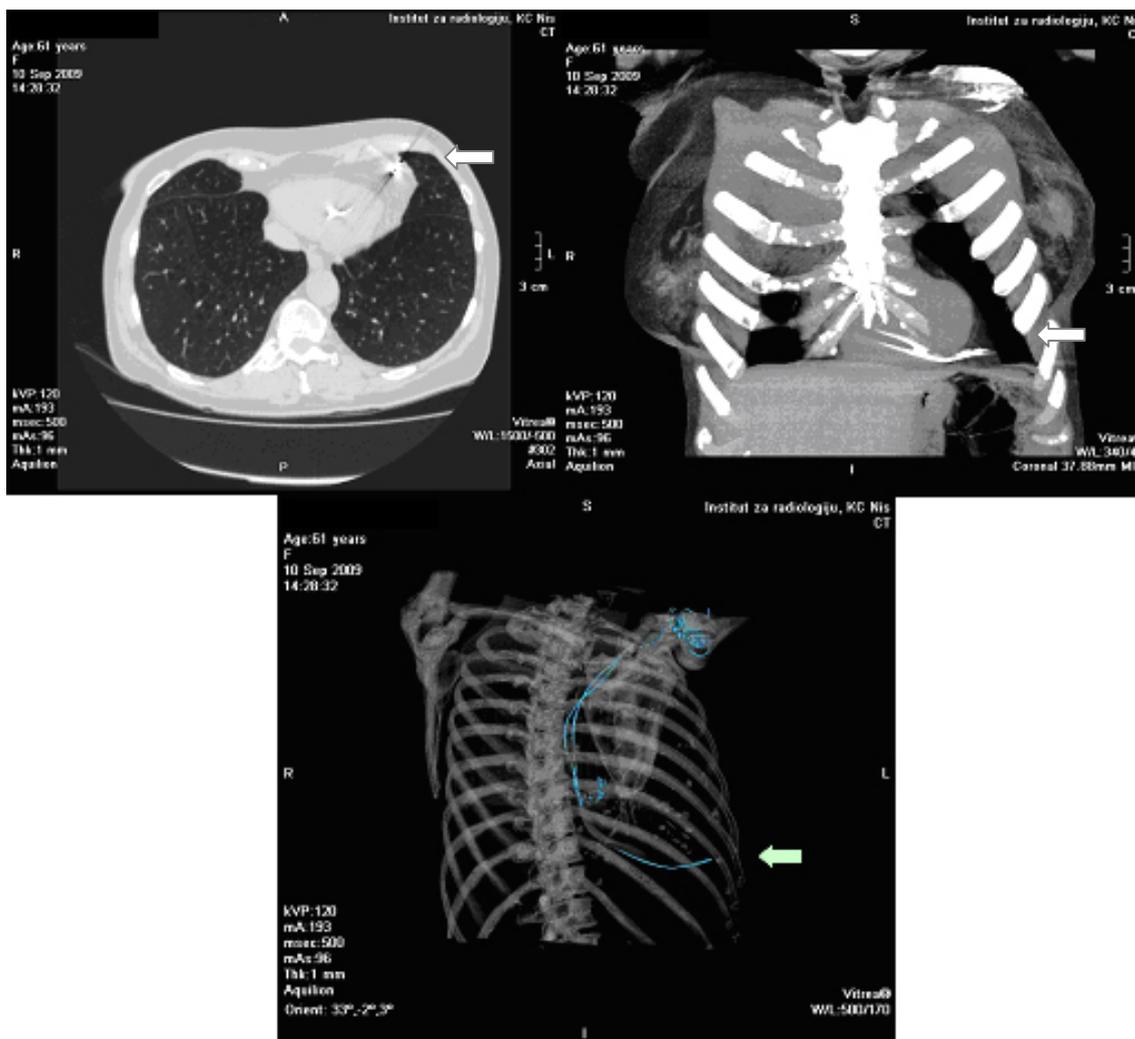


Figure 2. Multislice scanner of thorax

Discussion

Nowadays, pacemakers are used for therapy of numerous rhythm abnormalities. The most frequent complications after pacemaker implantation are local haematoma and chest discomfort. Rare complications, such as perforation of myocardium, pneumothorax and sepsis can be fatal (1). Perforation by electrode is a rare complication with the incidence from 0.3% to 1.2%, the early perforation within 30 days being more common than the ones occurring after that period (2,3). Myocardial perforation can cause different clinical symptoms: dispnea, palpitations, chest pain combined with pericardium effusion or tamponade in severe cases, hemothorax, and extracardial stimulation of muscle. Also, the loss of capture and sensing can cause syncope and sudden cardiac death (4). In case of suspected perforation, after electronic pacemaker control, radiography of thorax, ECG and echocardiography can be of great help to determine the diagnosis. In this case, five days after the implantation, the standard pacemaker control using analyzers, ECG and fluoroscopy were used for establishing the early diagnosis of myocardial perforation, which was confirmed by cardiac MSCT. CT can be very

useful and efficient diagnostic procedure in suspicious perforation (5). Besides, it provides accurate information on electrode position and its relation to other tissues and organs, which can be very useful for further therapeutical approach. The perforation can be caused by patient, but also by doctor during the procedure. The causes attributed to patients can be thin myocardial wall of the right chamber in dilated cardiomyopathy, or some inflammatory diseases of myocardium. Rough manipulation with electrode during the procedure and usage of active fixation electrode can be one of the reasons for myocardial perforation(6). The treatment options and replacement of electrodes are similar in many medical centers, but for the safety reasons this procedures could be done at centers equipped with cardiovascular surgery units (7).

Conclusion

This case report has shown that careful observation of the patient after implantation, combined with standard diagnostic methods with MSCT, can point to severe complications of pacemaker implantation, such as the right chamber myocardial perforation.

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PERFORACIJA DESNE KOMORE AKTIVNOM ELEKTRODOM STALNOG PEJSMEJKERA-PRIKAZ BOLESNIKA

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Perforacija desne komore je retka komplikacija implantacije stalnog pejsmejker. Mi smo prikazali slučaj žene stare 61 godinu sa sick sinus sindromom kojoj je ugrađen stalni dvokomorni pejsmejker. Perforacija desne komore aktivnom ventrikularnom elektrodom dijagnostikovana je 5 dana nakon ugradnje. Standardni elektrokardiogram uz savremene dijagnostičke metode, kao što je multislice skener grudnog koša neophodni su u detekciji ove retke komplikacije ugradnje pejsmejker. *Acta Medica Medianae* 2010;49(2):48-50.

Ključne reči: *aktivna elektroda, stalni pejsmejker, perforacija miokarda*