Right Ventricular Free Wall Perforation without Tamponade: A Rare Complication of Permanent Pacemaker Lead Placement

Serkan Burc Deser 1*, Mustafa Kemal Demirag 2

1, 2 Department of Cardiovascular Surgery, Samsun, Turkey.

INTRODUCTION

Cardiac pacemakers are placed on the right and left ventricles to provide stimulations for myocard muscle contractions. During the course of life, the pacemaker leads sway with the heart during each heartbeat. Therefore, not only abrasion but also degeneration may occur on the myocardium and the pericardium. Hence, lead displacement is a frequently seen complication [1]. Fatal results may be seen because of ventricular perforation. Perforation of the atrial and ventricular myocardium are mostly seen. Until the ventricular lead tip goes out of ventricle cavity about 3 mm, it is usually not noticeable by imaging techniques. Cardiac tamponade is a rare phenomenon but if it occurs, it is usually seen within
24 hours after placement. Myocardial perforation with modern pacemaker leads is relatively rare. Pericardial pain, pericardial effusion and tamponade induced with tachycardia, tachypnea, hypotension, palpitation, cyanosis and agitation may be seen as complaints of the patients due to perforation. Also, enhance pericardial friction rub, diaphragmatic stimulation and ventricular pacing may be seen or patients may be asymptomatic as well. While pacemaker leads are pacing, you should keep in mind that right bundle block may occur. Hemopericardium can be presented in suspected cases and must be diagnosed with pericardiocentesis [2].

CASE PRESENTATION

A 65-year-old female patient was presented with syncope and dizziness was admitted to us. On admission sinus bradycardia with 54 heart beat per minute was determined (Figure 1). Thereupon, temporarily internal pacemaker was placed into the right ventricle via the right femoral vein. A subsequent sinus bradycardia was observed and sick sinus syndrome (SSS) had been diagnosed on Holter study. A dual chamber (DDDR Medtronic Sigma SDR 303, Medtronic Minneapolis, MN, USA) permanent pacemaker with tined leads in the right ventricle and the right atrial appendage was implanted through the left subclavian vein with a pulse generator (PG) in the subcutaneous plane of the left pectoral region. Due to the subsequent wound infection, pacemaker pulse generator was removed to the right subclavicular region. No complication was noticed immediately after the intervention and the patient was discharged with complete recovery. One month after the intervention, the patient was admitted to cardiology outpatient clinic with dizziness and recurrent syncope symptoms. Despite the pacemaker was pacing, sinus bradycardia was determined. Due to a previously placed internal pacemaker which was not working regularly and ongoing wound infection on the site of the pulse generator, she was referred to us for placement of external PPM. Transthoracic echocardiography examination revealed enlarged left atrium with 39 mm length, enlarged right ventricle with 36 mm length, increased pulmonary artery pressure with 30 mm of mercury, mild mitral valve and moderate tricuspid valve regurgitation and ejection fraction was 58% (Figure 2). We decided to perform open surgery. Routine preparation for surgery was made and informed consent was taken. Under general anesthesia, a median sternotomy was performed. We determined the right ventricle was perforated by the tip of the pacemaker lead (Figure 3). However, there was no finding for perforation on preoperative examinations. Neither bleeding nor pericardial effusion was detected. The ventricular defect was repaired with pledged stitches after pushing back the lead to the ventricle cavity (Figure 4). Then we placed two epicardial leads. The patient was discharged one week after the surgery with complete recovery.
FIGURE LEGENDS

[Figure 1]

[Figure 2]
DISCUSSION

Since the enhancement of invasive cardiac procedures in recent years and usage of anticoagulants, incidences of iatrogenic cardiac tamponades are increasing. Corticosteroid usage, long-stretched pacemaker lead, bipolar electrodes or high body mass index are the most common causes of the perforation. Early and late perforation rates were 5% and 0.17% respectively after the lead placement [3]. Patients are usually asymptomatic, however, pulmonary embolism, hemopneumothorax, cardiac tamponade or sudden death can be seen after the lead implantation [4]. Cardiac tamponade findings include chest pain, extra-cardiac muscle stimulation (diaphragm, intercostal muscles), palpitation, dyspnea, cyanosis and agitation. Cardiac tamponades are mostly seen in the early post-operative period (1 week) rather than the later post-operative period as clinical findings. It is a challenge to decide whether the patient needs to intervene or not. When perforation is determined immediately after the lead placement, new leads should be placed under echocardiography rather than withdrawing. For this reason, it constitutes a major risk. If the patient is hemodynamically stable and the ventricular defect is not detected, the defect may be closed by itself, fat tissue or clot [5]. In conclusion, during or after the procedure, echocardiography, fluoroscopy or telegraphy must be done and attention must be paid during placing the leads due to the perforation risk. Prompt intervention must be done with the help of cardiac surgeons for the complications.

CONCLUSION

During or after the procedure, imaging techniques like echocardiography, scope or telegraphy must be done carefully. If a complication occurs, prompt intervention with the help of cardiovascular surgeon is recommended.

REFERENCES


