



Inadvertent left ventricular pacing and perforation by a temporary pacemaker

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Abstract

Myocardial perforation by pacemaker electrode is a very serious complication. Usually, the pacemaker electrode perforates the right ventricle, but rarely the left ventricular myocardium. We describe an 82-year-old female patient who presented with left ventricular pacing after temporary pacemaker implantation and was diagnosed with myocardial perforation. Emergency thoracotomy showed that the exact position of the cardiac perforation was close to the left ventricular apex. Perforation of the left ventricular free wall by an electrode sometimes progresses slowly. We should be alert to the possibility of left ventricular perforation, in which case, immediate surgery is the best option.

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Keywords:

Temporary pacemaker electrode; Left ventricular pacing; Myocardial perforation; Thoracotomy

Introduction

Pacemakers have been in use for clinical therapy for more than 50 years and have saved many lives. However, pacemaker implantation can lead to serious complications that can threaten the lives of patients, one of which is myocardial perforation by the pacemaker electrode. Once the pacemaker electrode perforates the myocardium, it can lead to pericardial tamponade, which can cause death. Usually, the pacemaker electrode perforates the myocardium of the right ventricle apex, but rarely the left ventricular myocardium. We herein report a case of a patient with pericardial tamponade after temporary pacemaker implantation.

Case presentation

We report an 82-year-old woman who experienced dizziness and amaurosis for 1 day without syncope. She presented to the emergency department of the local hospital on July 14, 2016. Electrocardiography (ECG) showed complete atrioventricular block (AVB) with slow ventricular rates (45 beats/min). The patient was admitted to the hospital, and a temporary pacemaker was implanted through the right internal jugular vein. The patient complained of

chest tightness, chest pain, and abdominal distension upon electrode implantation, and on the next day, she experienced gradual expiratory dyspnea.

On July 15, 2016, the patient was transferred to the emergency room of Zhejiang Provincial People's Hospital. The bedside ECG indicated sinus rhythm, third-degree AVB, and pacemaker rhythm. The temporary pacemaker electrode implantation depth was 40 cm. The QRS wave of the ventricular pacing ECG in the chest lead showed right ventricular conduction delay morphology (Fig. 1). Echocardiography showed a high amount of pericardial effusion and prompted the electrode terminal in the left ventricular cavity, and chest computed tomography (CT) showed that the ventricular free wall was perforated by the temporary pacemaker electrode, which led to the pericardial effusion. We were unable to determine the exact position of the perforation because of artifacts (Fig. 2).

In the afternoon, symptoms of pericardial tamponade gradually manifested, with her blood pressure decreasing from 96/70 to 82/46 mmHg. We immediately started her on vasopressor drug therapy and scheduled her for emergency surgery.

Thoracotomy was performed under general anesthesia. Approximately 400 mL of dark red pericardial effusion was cleared by suction. The temporary pacemaker electrode was found in the left ventricular free wall. The exact position of the cardiac perforation was close to the left ventricular apex, 1.5 cm left of the left anterior descending artery (Fig. 3). A hematoma was noted in the perforation, which helped stop

Abbreviations: CT, computed tomography; AVB, atrioventricular block; ECG, electrocardiogram.

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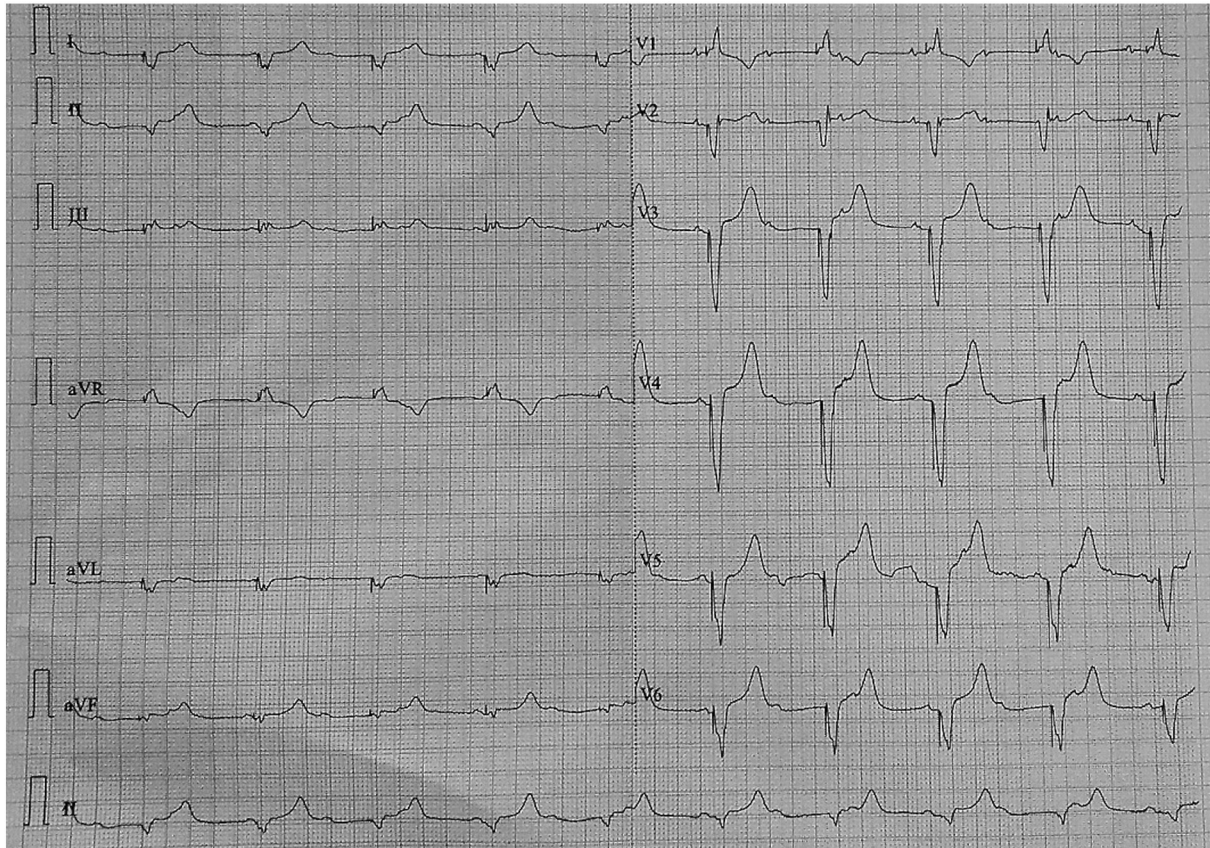


Fig. 1. Electrocardiogram of the temporary pacemaker, with the QRS main wave up in the V1 lead, the QRS anchored down in the V2–V6 leads, and the QRS main wave down in the I, II, and III leads, suggesting that the pacing electrode tip was in the left ventricle.

the bleeding. The surface of the parietal pericardium in contact with the electrode tip formed an ulcer. Purse-string suture was performed on the perforation site and the hematoma. A temporary epicardial pacing electrode was implanted to her epicardium and was connected to another temporary pacemaker. The endocardial temporary pacemaker electrode was gradually withdrawn. No continuous bleeding was noted on the left ventricular perforation site. Finally, the pericardium, sternum, subcutaneous tissue, and skin were sutured. The patient was brought to the intensive care unit, and her vital signs

stabilized. Two weeks later, the patient received permanent pacemaker implantation through the right subclavian vein and the tip of the ventricular electrode located at the right ventricular apex. The follow-up until now has been uneventful.

Discussion

Temporary pacemakers are widely used in patients with severe slow-rhythm disorders in Chinese county hospitals. Generally, temporary pacemaker electrode implantation to

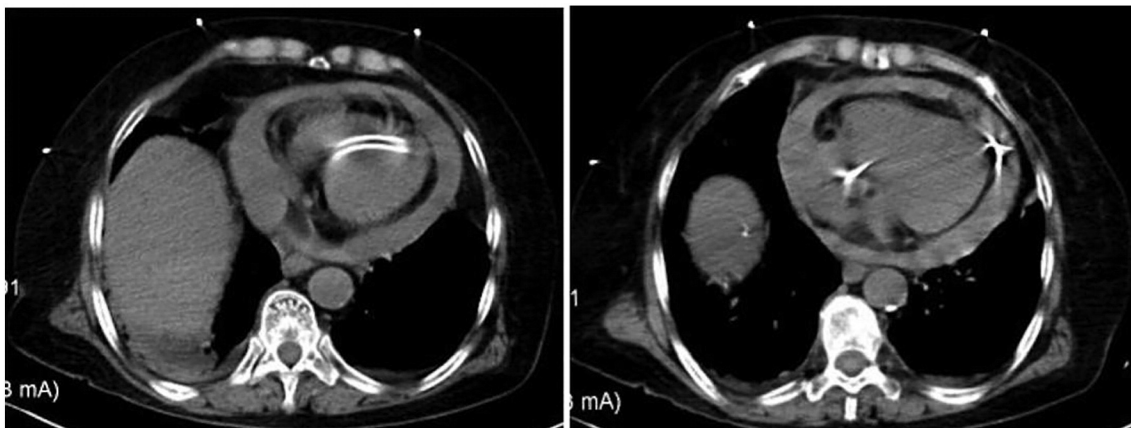


Fig. 2. Electrode tip in the apex (40-slice spiral computed tomography), with a high amount of effusion in the pericardial cavity.

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