

Sub acute myocardial perforation following permanent pacemaker insertion

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ABSTRACT

Keywords:

Implantable cardiac electronic device
Myocardial perforation
Pericardial effusion
Permanent pacemaker

Myocardium perforation after cardiac implantable electronic devices (CIEDs) is a rare (~1%)¹ but potentially fatal complication if not recognized early. It often occurs acutely after insertion although it can range from days to years. Here, we report a 73-year-old gentleman presented with an acute onset of chest pain after 48 hours of permanent pacemaker insertion for symptomatic bradycardia. Due to the overlapping symptoms of acute myocardial infarction and dynamic ECG changes, the patient was evaluated for acute coronary syndrome and ruled out after the serial cardiac Troponin(s) within the normal range. The patient was found to have early signs of pericardial tamponade with the right ventricular lead perforating the myocardium on the transthoracic echocardiogram. The patient was treated with pericardial drain and emergency lead extraction.

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Introduction

Myocardium perforation after cardiac implantable electronic devices (CIEDs) is a rare (~1%)¹ but potentially fatal complication if not recognized early. It often occurs acutely after insertion although it can range from days to years. Here, we report a 73-year-old gentleman presented with an acute onset of chest pain after 48 hours of permanent pacemaker insertion for symptomatic bradycardia.

Learning objective

To raise the awareness of early recognition of delayed myocardial perforation in a patient with recent cardiac implantable electronic devices.

To underscore the modality of choice in diagnosing myocardial perforation by CIEDs.

Clinical description

A 73-year-old gentleman presented to the district emergency department with acute onset of cardiac sounding

central chest pain lasted for 25 minutes. The pain was later localized to the left subcostal space and exacerbated by deep breathing. He was discharged home from a tertiary centre 2 days later after having a dual chamber pacemaker insertion without any immediate postoperative complications. He has a past medical history of controlled hypertension, otherwise no other significant medical conditions and usually fit and well.

Due to the central chest pain, acute coronary syndrome was evaluated initially. The serial 12-lead ECG showed dynamic T wave changes in the antero-lateral chest leads (Figs 1 and 2, <http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445&file=1021>, <http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445&file=1022>). Acute coronary syndrome was ruled out after normal cardiac troponins. An immediate chest X-ray was done and did not reveal any remarkable findings (Fig. 3 <http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445&file=1019>). The chest pain settled with bed rest and the physical examination was unremarkable. The patient haemodynamic conditions remained stable with blood pressure of 117/68 mmHg and heart rate of 67 beats per minute. An urgent transthoracic echocardiography (Video 1 and Fig. 4,

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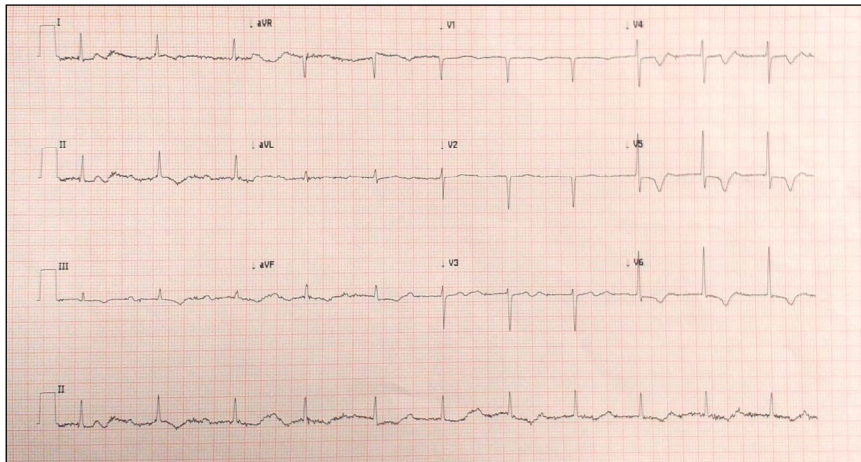


Fig. 1 – Baseline ECG.

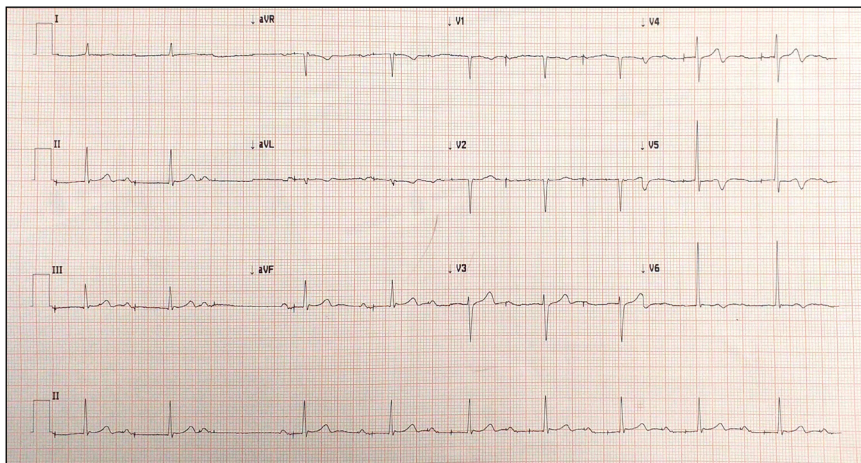


Fig. 2 – ECG repeated at 30 minutes.

<http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445&file=1023>, <http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445&file=1020>) later confirmed the

perforation of myocardium by the ventricular lead with early signs of tamponed. The patient was transferred immediately to the tertiary centre for pericardial drain and lead extraction.

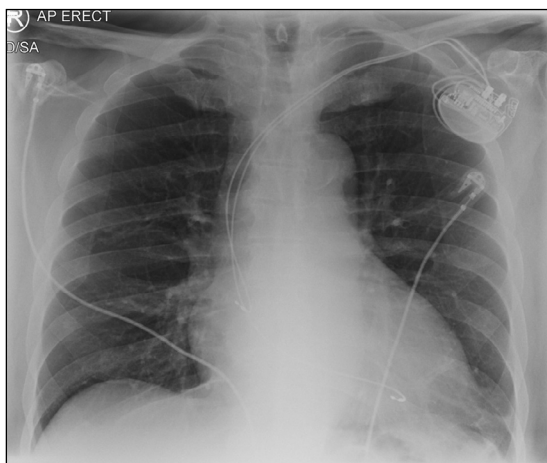


Fig. 3 – CXR (AP) – mild cardiomegaly with dual chamber pacemaker in place.

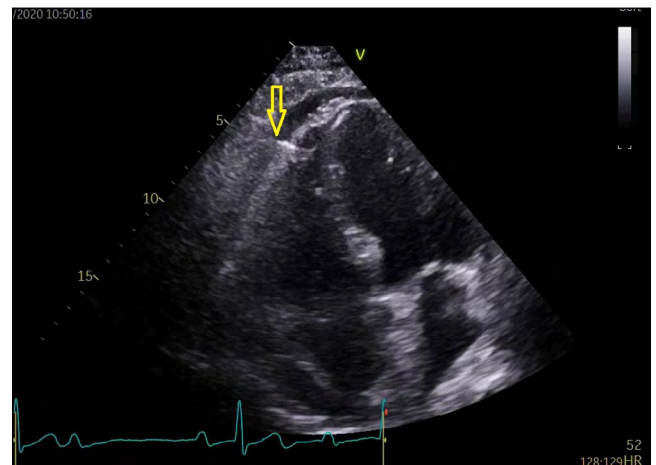


Fig. 4 – Transthoracic echocardiogram.

Discussion

On retrospective case analysis, failure of pacing capture was noted as a first clue on the baseline ECG with Mobitz Type 1 AV block. It was very relevant that acute coronary syndrome was ruled out due to the initial presentation of the nature of the chest pain and the patient's age group. In this case, chest X-ray was not conclusive and transthoracic echocardiogram (TTE) was both diagnostic and evaluated the significance of pericardial effusion showing early echocardiographic features of tamponed.

In making the diagnosis of myocardial perforation by pacemaker leads and other CIEDs, chest X-ray was considered as unreliable in diagnosing cardiac perforation (sensitivity 61.1% and specificity 88.9%).² Transthoracic echocardiogram (TTE) can diagnose and provide haemodynamic information for clinical evaluation, however its utility in diagnosis of myocardial perforation is inferior to that of Computed Tomography (CT) imaging (sensitivity 41.2–47% and specificity 84.2%).² CT imaging is superior to other imaging modalities and emerging as a gold standard for diagnosis (sensitivity – 100% and specificity 85.7%).²

Conclusion

Acute presentation of chest pain in a patient with cardiac implantable devices is likely to be more prevalent since an increasing number of patients are having these procedures. Although delayed myocardial perforation is a rare

complication, more and more cases are being reported.^{1,3–5} A high index of suspicion is the key in making diagnosis for cardiac perforation in such patients and CT imaging is the imaging modality of choice for diagnosis.^{2,6}

Conflict of interest

None of the authors have any potential conflict of interest.

Reference to the online article

<http://www.cksonline.cz/coretvasa-case-reports/clanky.php?p=detail&id=144&pid=1445>

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CURRICULUM VITAE

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Graduated from University of Medicine – 2 (Myanmar) in 2007 and obtained Membership of the Royal Colleges of Physicians of the United Kingdom in 2017. Previously practiced as a Clinical fellow in Internal medicine at Queen Elizabeth Hospital in Kings Lynn, United Kingdom from 2018 and currently practicing as Specialty Doctor in Cardiology Department at the same hospital from 2020.