Very late perforation of an implantable cardioverter defibrillator lead:

a case report

INTRODUCTION

Every year approximately 40 000 pacemakers and defibrillators are implanted in the UK amounting to one new implanted device per GP.¹ Placements of pacemakers or implantable cardioverter defibrillators (ICDs) have become routine procedures and are generally associated with low complication rates. One of the most endangering complications is the perforation of electrodes. Usually the perforation of leads occurs shortly after implantation and it is an acute and potentially life-threatening event.^{2,3} Late lead perforations more than 1 month after initial implantation have been described as exceedingly rare incidents.^{4,5}

CASE REPORT

A 71-year-old male with coronary artery disease, impaired left ventricular ejection fraction of 24%, and persistent atrial fibrillation was supplied with an ICD for primary prevention of sudden cardiac death. The patient was doing fine for 11 months while leading an active life both cycling and playing golf.

He then experienced a sudden onset of thoracic pain related to deep in- and exhalation. After 1 week of unsuccessful treatment with ibuprofen for suspected pleuritis and possible muscular-skeletal pain, he presented at the hospital. The patient seemed to be weak and exhausted, his blood pressure was low (96/55 mmHg), and sinus tachycardia (110 bpm) was recorded. The INR was 3.6 (patient on warfarin) and other laboratory test resulted in normal values. On interrogation of the ICD system, an elevated ventricular pacing threshold (2.75 V at 1.0 ms) was encountered combined with reduced sensing amplitude (5.6 mV) and normal pacing impedances (403 Ohms). Similar values had already been observed 2 months earlier for the first time during routine follow-up. Echocardiography showed a large pericardial effusion,

while ECG and a chest X-ray revealed no abnormalities. A CT scan then disclosed the perforation of the ICD lead (Riata 1582, St Jude Medical, Sylmar, Ca, US) into the pericardium (Figures 1a and 1b).

Pericardiocentesis was performed on an emergency basis, with the evacuation of 1300 ml haemorrhagic liquid, and a pericardial drainage catheter was introduced into the pericardial sack. Thereafter, the right ventricular lead was transvenously explanted and a new ICD lead (Durata 7122, St Jude Medical, Sylmar, Ca, US) was placed into the right ventricular septum. As the pericardial drainage catheter had not been draining further blood, it was removed the next day, and the patient was discharged 4 days later.

DISCUSSION

Lead perforation is known to be a rare complication after placement of pacemaker or ICD systems.²⁻⁵ Perforations are typically seen within hours or the first days after implantation; however, recent literature suggests a trend towards delayed lead perforations.^{6,7} The case presented is remarkable as it describes, on the one hand, a very late lead perforation after implantation and, on the other hand, the gradual perforation process which is assumed to be typical for late lead perforations.⁴ In retrospect, the different symptoms reported by the patient can be explained by a stepwise perforation process. As a first sign of lead movement, altered electrical characteristics of the lead, with a rise in the pacing threshold and a decline in the signal amplitude, were observed. Two months later, the patient complained about non-specific thoracic pain which may have been caused by a pericardial irritation after the lead had moved further. One week further, the patient became severely symptomatic after 1300 ml of haemorrhage had accumulated in the pericardial sack. The large amount

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Figure 1a and b. A CT scan shows the perforation of the ICD lead (arrow) into the pericardium and the pericardial effusion.

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predispose for the development of cardiac tamponade after pacemaker or ICD implantation, were present in the patient.^{2,8}

Except for late lead perforation, GPs are advised to be aware of other potential complications occurring after the placement of cardiac implantable electronic devices which may include local bleeding or pocket infection, lead dislodgement, or failure with reoccurrence of the symptoms that had led to the pacemaker implantation, subclavian vein thrombosis, or potential lead endocarditis in the presence of fever of unknown origin.

CONCLUSION

Late lead perforation can cause haemorrhagic pericardial effusion. Although rare, the occurrence of late lead perforations should always be considered in patients presenting with sudden onset of chest pain, discomfort, and/or changed lead parameters.

Patient consent

The patient has provided consent for this case report and images to be published.

Provenance

Freely submitted; externally peer reviewed.

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