

CASE REPORTS

Recurrent strokes caused by a malpositioned pacemaker lead

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Abstract

This case report illustrates the case of a patient who developed recurrent strokes after a pace maker lead was inserted into his left ventricle. It was removed successfully by the cardiothoracic surgeons but he remained very dependant functionally. This case highlights the importance of always reviewing the electrocardiogram and chest radiograph after the insertion of a pacemaker as late diagnosis of this complication can leave the patient with significant morbidity.

Keywords: *strokes, pacemaker, malposition, elderly*

A 68-year-old man was admitted to our stroke unit for on going management. A month prior to this admission, while on holiday in the USA, he had presented to a local hospital with pre-syncopal symptoms and hypotension. Electrocardiogram demonstrated a sinus bradycardia and a left bundle branch block. A permanent pacemaker was inserted.

Two days later, he developed acute confusion. A CT brain scan demonstrated a recent right frontal infarct and a left inferior cerebellar infarct. Atrial fibrillation was noted. Carotid ultrasonography and CT brain angiography were normal. An electrocardiogram was performed which diagnosed a 'lead dislodgement'. He underwent a second procedure to reposition the dislodged atrial lead. Following this he developed a right-sided hemiparesis and aphasia. A repeat brain CT scan showed a new left frontal lobe infarct. He was transferred to the UK and admitted to our unit.

An electrocardiogram showed a right bundle branch block pattern. A pacemaker check highlighted that the ventricular lead was not pacing. His chest radiograph (Figure 1) showed both pacing wire tips to be within the left ventricle. CT scan demonstrated that the leads had exited the venous system, punctured the arch of the aorta just proximal to the origin of the great vessels and passed through the aortic valve into the left ventricle.

He was anti-coagulated with warfarin and 2 months later underwent cardiac surgery. It was necessary to go on cardiopulmonary bypass, cool the circulation causing hypothermic circulatory arrest and open the aorta/aortic arch. The leads were found to have entered the subclavian vein but then to have exited the vein and punctured the aortic arch just anterior to the left common carotid artery origin (Figure 2). Thrombus was identified on the inside of the

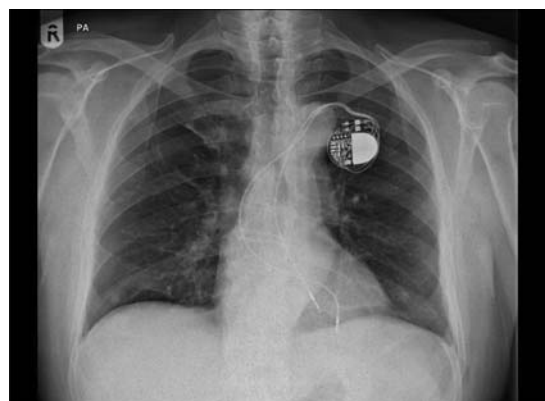


Figure 1. Chest radiograph demonstrating malpositioned pacing leads.

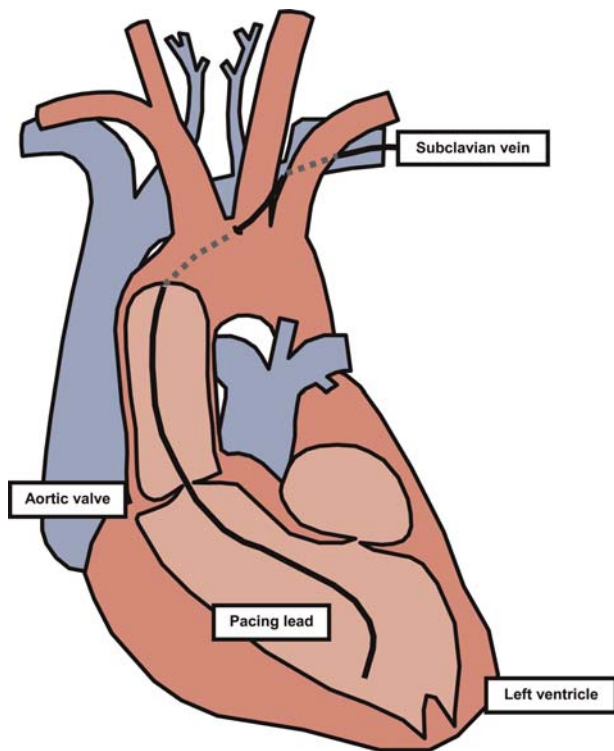


Figure 2. Schematic diagram showing lead exiting the venous system by puncturing the aortic arch anterior to the origin of the left common carotid artery.

aorta surrounding the leads as they passed through the aortic wall into the arch. The leads were removed from the left ventricle through the aortic valve carefully, ensuring that no clot was dislodged. The leads were then removed from the puncture sites and the defects over sewn. The aorta was closed and circulation re-established. He came off cardiopulmonary bypass and made an uncomplicated haemodynamic recovery postoperatively.

However, his care needs remain high and he requires long-term care.

Discussion

Complication rates of 4–5% after pacemaker insertion have been found [1]. Malpositioning of a pacing lead into the left ventricle is rare but has been previously described [2–5] and has occurred when the leads pass through a patent foramen ovale or atrial septal defect [3, 4]. Patients have been asymptomatic even up to 16 years later [3–5]. Strokes can be the only presenting feature [2, 4] and have previously occurred when the leads have also crossed the aortic valve [2].

Neurological symptoms in the context of a recent pacemaker insertion should be attributed to a malpositioned lead until proved otherwise [4] even in the presence of

other risk factors for stroke. Routine pacemaker interrogation can miss the diagnosis because of the use of modified or a limited number of surface leads [6]. Post procedure 12-lead electrocardiogram and chest radiograph lateral and postero-anterior views should be carefully inspected routinely [5]. A right bundle branch pattern should generate a high index of clinical suspicion and prompt further investigations such as echocardiography or other imaging modalities to confirm the exact position of the wire [6].

Once diagnosis is confirmed patients can either be followed up [4] anticoagulated [4, 5] or have the wires removed [5] depending on the individual risk: benefit ratio.

In our patient earlier detection may have prevented his significant morbidity. Although atrial fibrillation was present, we consider the malpositioned pacemaker lead to have been the main culprit.

We have highlighted a rare but serious complication of a common procedure, which despite successful removal has still resulted in a tragic outcome.

Key points

- Malposition of pacing wires can occur.
- Routine review of chest radiograph and electrocardiogram post procedure is essential.
- Strokes can be a significant complication.

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