

[CASE REPORT]

Leadless Pacemaker Implantation for a Super-elderly Woman with a Mediastinal Tumor

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Abstract:

A 95-year-old woman with no cardiac history presented with symptomatic complete atrioventricular block. She underwent temporary cardiac pacing via the cervical vein, but a pacing lead could not be introduced via the usual route because of a mediastinal tumor. A leadless pacemaker (Micra™; Medtronic, Minneapolis, USA) was implanted at the right ventricular septum via the right femoral vein. The procedure time was 40 minutes, with no complications noted. Over the two-year follow-up period, the threshold and impedance remained stable. The implantation of a leadless pacemaker was useful for improving the symptoms of a super-elderly woman with a mediastinal tumor.

Key words: pacemaker, elderly, mediastinal tumor

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Introduction

A leadless pacemaker is a new concept in which a miniaturized pacing device is self-contained within the heart. This technology allows for the elimination of potential complications associated with the presence of transvenous leads and a pulse generator. The anticipation of difficult vascular access has been cited as a common reason for choosing a leadless pacemaker system instead of a traditional transvenous pacemaker (1). However, cases of mediastinal tumor are rare, although they are considered well-indicated for leadless pacemaker implantation.

We herein report a super-elderly woman with a mediastinal tumor in whom we implanted a leadless pacemaker.

Case Report

A 95-year-old woman with no cardiac history presented with symptomatic complete atrioventricular block. Her general health was good, but she felt dyspnea and fainting when she walked. There was no edema of the face or upper limbs. Holter electrocardiography revealed pauses of 10 s (Fig. 1A). She underwent temporary cardiac pacing via the

cervical vein, but a pacing lead could not be introduced via the usual route because of a mediastinal tumor.

Contrast computed tomography revealed that the superior vena cava and both the right and left brachiocephalic vein were occluded by a mediastinal tumor (Fig. 2). A pacing lead was therefore introduced via the right femoral vein, and she was transferred to our hospital (Fig. 1B). The heart team discussed her case and designed a treatment strategy that included implantation of a leadless pacemaker, and the patient agreed to proceed with the leadless pacemaker implantation. The mediastinal tumor had first been detected 10 years ago and followed up as a mediastinal cyst. We speculated that the reason why the patient did not show symptoms of superior vena cava syndrome was that collateral circulation had developed due to the slow growth of the mediastinal tumor.

We implanted a leadless pacemaker (Micra™; Medtronic, Minneapolis, USA) at the right ventricular septum via the right femoral vein (Fig. 3). The impedance was 840 ohms, and the threshold was 0.63 V at 0.24 milliseconds. The procedure time was 40 minutes, with no complications noted.

She experienced no dyspnea or fainting when she walked after the procedure and was discharged 11 days after the implantation. Her cardiothoracic ratio on chest X-ray decreased after the implantation of the leadless pacemaker (Fig. 4).



Figure 1. An electrocardiogram. (A) Holter ECG, (B) lead II before implantation of a leadless pacemaker (pacing by a temporary pacing lead from the femoral vein), and (C) lead II after implantation of a leadless pacemaker.

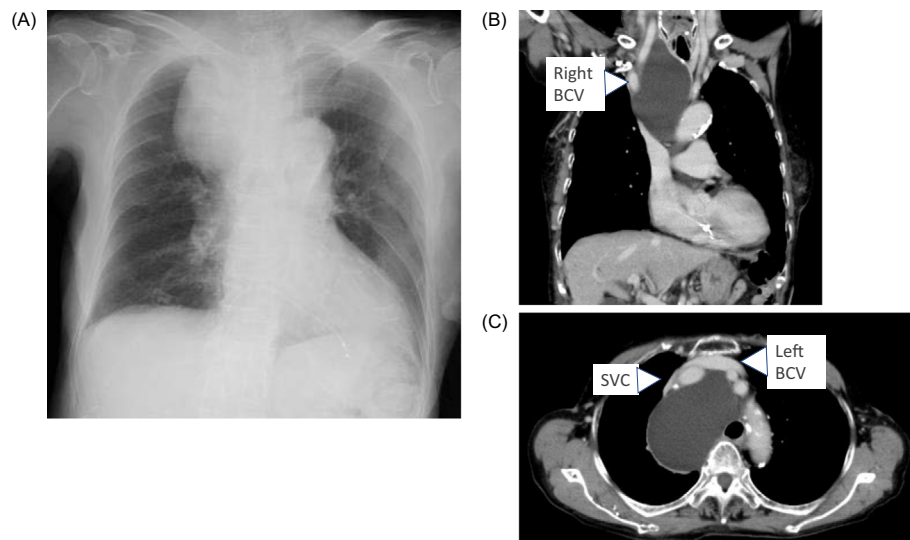


Figure 2. Diagnostic imaging of the mediastinal tumor. (A) Chest X-ray, (B) coronal view (contrast computed tomography), and (C) axial view (contrast computed tomography). BCV: brachiocephalic vein, SVC: superior vena cava

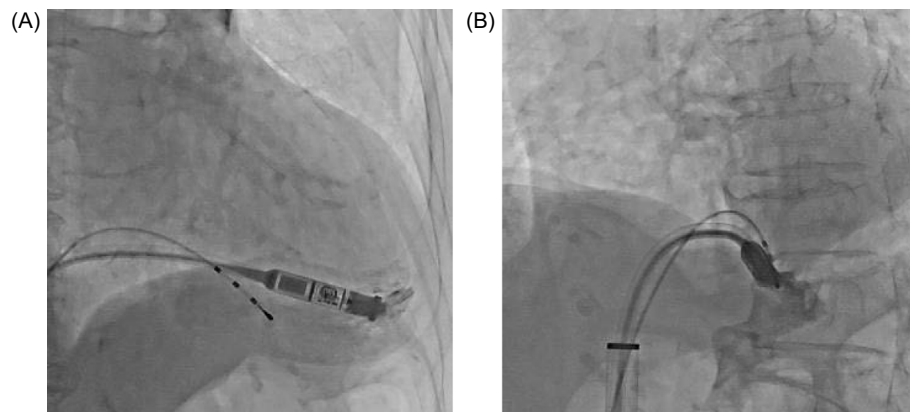


Figure 3. Implantation of the leadless pacemaker. (A) Right anterior oblique view and (B) left anterior oblique view.



Figure 4. Chest X-ray after implantation of the leadless pacemaker.

Surface electrocardiography at an outpatient clinic showed full ventricular pacing (Fig. 1C). The average ventricular pacing rate was 99%, and she had no pacemaker symptoms, such as palpitation or fatigue. Over the two-year follow-up period, the threshold and impedance remained stable. She lived to 97 years old, at which point she died of pneumonia.

Discussion

A recent study compared the outcomes of leadless pace-

maker implantation and transvenous single-chamber pacemaker in super-elderly patients, including short-term postoperative complications, and the prognosis (2). We confirmed that the threshold, impedance and battery capacity in a leadless pacemaker remained stable for two years in a super-elderly woman. The hemodynamics of a dual-chamber pacemaker (DDD) are better than those of a single-chamber pacemaker (VVI) because of the atrioventricular synchronization. However, such “leadless” technology can only be applied for VVI devices at present. Fortunately, our patient did not show pacemaker syndrome.

In conclusion, the implantation of a leadless pacemaker was useful for improving the symptoms of a super-elderly woman with a mediastinal tumor.

The authors state that they have no Conflict of Interest (COI).

References

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