CASE REPORT

Implant of a left atrial appendage occluder device (Watchman) and leadless pacing system (Micra) through the same venous access in a single sitting

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Accepted 30 January 2018

SUMMARY

A left atrial appendage occluder device (Watchman) and leadless pacemaker (Micra) was implanted from a single right femoral vein access in a 73-year-old female patient with persistent atrial fibrillation and symptomatic tachy-brady syndrome and unable to take oral anticoagulants. Standard methods of implantation were followed for both procedures. The Watchman device was implanted first followed by dilatation of the same venous access site in order to implant Micra transcatheter pacing system. The patient tolerated the procedures well and there were no complications. At the end of 1 month, both the devices were found to be working well.

BACKGROUND

Both leadless pacemakers (Micra) and the Watchman left atrial appendage (LAA) occlusion device are newer technologies. Some patients with atrial fibrillation (AF) require both devices. There is insufficient experience worldwide to show that both devices can be safely implanted at the same time and through the same venous access. This approach can save time, energy and patient discomfort.

CASE PRESENTATION

A 73-year-old woman with persistent AF had gastrointestinal bleeding in the past and did not wish to continue with oral anticoagulation. Her CHA₂DS₂-VASc score was 4 and HAS-BLED score was 3. Considering her high risk for thromboembolism and inability to take oral anticoagulation, a LAA occluder device (Watchman) was indicated.¹ She also had symptomatic AF with tachy-brady syndrome, an indication for a pacemaker.² In view of her advanced age and to avoid an additional surgical procedure we considered a leadless transcatheter pacing system (TPS) Micra to be implanted concurrently. Both devices were implanted as a combined procedure through single-venous access.

The Watchman implant was carried out under general anaesthesia, as per standard protocol.² The right femoral vein was punctured, a St Jude SL0 sheath introduced and an atrial septal puncture done using a Heart Span needle under trans-oesophageal echocardiography and fluoroscopic guidance. The SL0 sheath was then replaced with a dual-curve 14F Watchman delivery sheath, and a contrast injection into the LAA was performed for sizing. A 30 mm Watchman device was chosen

and successfully deployed in the LAA with an ideal position, good compression (22%) and no leaks (figure 1). The delivery system was removed, leaving a guide wire in the superior vena cava to proceed with the Micra implant. During the procedure, the activated clotting time (ACT) was maintained >300 s.

The Micra TPS implant was then done as per standard protocol.³ The access site was progressively dilated with 16 and 18F dilators prior to introduction of the Micra TPS sheath. This was positioned at the inferior vena cava right-atrial junction. A 6F pigtail catheter was then placed in the right ventricle to perform a ventriculogram in right and left anterior oblique views (30°). At our centre we do this for all Micra implants in order to visualise trabeculations better and predetermine the best site for implant. The Micra delivery catheter was then introduced. The natural curve of the catheter directed the device to the apical septum. Appropriate force was then applied to produce swan neck buckling of the catheter in order to achieve adequate fixation of the device. The device was then deployed, a good tug test demonstrated (three out of four tines fixed to the right ventricular septum) and satisfactory pacing parameters ensured, and finally released from its tether (figure 1). The access site was closed with Proglide and a Z suture. Thus both the devices were implanted successfully (figure 2) at a single sitting from a single venous access.

OUTCOME AND FOLLOW-UP

Both procedures went well and without complications. At 1 month follow-up, both devices remained in situ and pacing parameters were stable.

DISCUSSION

Elderly patients are prone to AF and often have tachy-brady syndrome associated with it. This group of patients not only requires a permanent pacemaker implant, usually a single-chamber ventricular pacing device,¹ but also adequate protection from thromboembolism. Generally a vitamin K antagonist (VKA) or one of the newer oral anticoagulants (NOACs) are prescribed. However, VKAs and NOACs are associated with increased risk for major bleeding; especially with advanced age.^{4 5} Other drawbacks for VKAs are the need for frequent blood monitoring, compliance and interaction with food and drugs, whereas NOACs are costly and many of

To cite: Johar S, Luqman N.
BMJ Case Rep Published
Online First: [please
include Day Month Year].
doi:10.1136/bcr-2017-
222471

Figure 1 Deployment of left atrial appendage (LAA) occluder device Watchman and leadless pacemaker Micra (RAO - right anterior oblique).

them do not have antidotes commercially available. More so, patients who have experienced serious bleeding complications in the past are often reluctant to go back on oral anticoagulants, as happened with patient. In such patients, the alternative method to prevent thromboembolism is occlusion of LAA with devices like the Watchman device. The LAA is the main source of cardiac thrombus (>90%) in non-valvular AF.^{6,7} The Watchman

device is implanted through femoral access and a 14F sheath. Use of large sheaths and the need for a trans-septal approach predisposes patients to additional serious complications (8.7%). These include pericardial effusion (4.8%), thrombus formation (4.2%), air embolism (0.6%), device embolisation (0.6%) and access-related complications (0.6%). However, outcomes for the Watchman device were comparable to oral anticoagulants in preventing strokes, cardiovascular deaths and systemic embolism. At the same time, there was a 29% reduction in stroke and 38% reduction in death.⁸

AF when associated with symptomatic bradyarrhythmia is an indication for single-chamber pacemaker therapy.¹ Conventional lead-based pacing systems are challenged with early perioperative (10%) and long-term complications (15%). These are related to pocket infection, lead fracture and malfunction, pneumothorax, tricuspid regurgitation, venous thrombosis, etc.^{9,10} The leadless pacing system like the Micra TPS, on the other hand, is associated with lower complication rates (4%). These are related to vascular access (0.7%), cardiac perforation (1.6%), thrombosis/embolism (0.3%) and others (1.7%).¹¹ However, the need for a 27F sheath to implant the device, its availability as a single-chamber device

Figure 2 Left atrial appendage occluder device (Watchman) and leadless pacemaker (Micra) after final deployment. TPS, transcatheter pacing system.

Learning points

- ▶ A left atrial appendage occluder device and leadless pacemaker can be implanted simultaneously in patients with atrial fibrillation if required.
- ▶ Both the devices can be implanted at the same sitting.
- ▶ Both the devices can be implanted through the same venous access; in this case, it was right femoral vein.
- ▶ No untoward complications occurred with this approach.

only, higher cost, lack of long-term performance data and lack of retrieval experience with chronic implants are the challenges to face. Nevertheless, when faced with a patient who has indication both for an LAA occluder device and a single-chamber pacemaker, perhaps a better choice would be to perform both the procedures at the same sitting and through the same venous access, as was done in this patient. This will reduce hospitalisation time, patient discomfort and cath lab time. There are not many reports of combined procedure of simultaneous implant of LAA occluder device and leadless TPS. In one such report, the LAA occluder was an Amplatzer device.¹² It could well be that this is the first case reported on the combined implant of a Watchman LAA occluder device and Micra TPS at the same sitting through the same venous access.

Contributors The Implant procedure was performed by SJ as the primary operator. He also contributed to the editing and writing of this paper. NL participated in the procedure as co-operator and collected all the material to write this paper. He also wrote the initial draft and did the literature search.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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