EP CASE REPORT

Safety and usefulness of a second Micra transcatheter pacemaker implantation after battery depletion

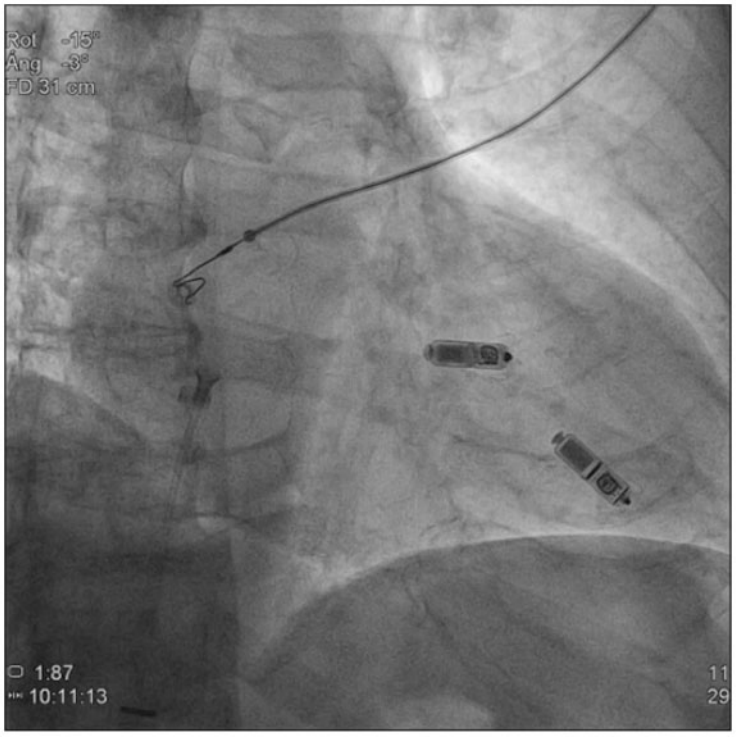
Paula Sánchez, Jose Apolo, Rodolfo San Antonio, Eduard Guasch, Lluís Mont, and José María Tolosana*

Arrhythmia Section, Cardiology Department, Thorax Institute, Hospital Clínic and IDIBAPS (Institut d'Investigació Agustí Pi i Sunyer), University of Barcelona, Barcelona, Catalonia, Spain

* Corresponding author. Tel: +34 93 2271778; fax: +34 93 4513095. *E-mail address*: tolosana@clinic.cat

Introduction

The Micra transcatheter pacing system (Medtronic Micra TPS) offers potential advantages over conventional pacing systems by decreasing the rate of complications such as lead dislodgement or fracture, pocket haematoma, lead infection, and tricuspid valve impairment.[1] However, protocols to manage these systems once the battery runs out are not standardized. Since implanted devices are expected to become encapsulated over time, the longer the length of implantation the greater the risks involved with percutaneous retrieval. It has been suggested that the best option is to turn off the old device, leave it in the heart, and then implant a new device in another location in the right ventricle (RV). Previous studies have shown that more than one Micra device can be accommodated in the RV of swine[2] and human cadavers.[3] Nevertheless, to date, no double implant has successfully been reported in humans, and therefore, no real-life data about sensing and capture parameters and the impact on RV function are currently available.



Case report

A 78-year-old man who received a Micra TPS in 2014 due to atrioventricular block reached the elective replacement time of the pacemaker. Reasons for early battery depletion were high right ventricular pacing threshold and 100% RV pacing. After obtaining patient consent, a second Micra transcatheter pacemaker was implanted.

As with the first implant, the second implant was made through right femoral vein access. The new device was placed in the midseptum of the RV, distant from the first pacemaker (*Figure 1*). The parameters of the new Micra TPS included a sense R-wave amplitude of 20 mV, impedance of 570 Ω, and a pacing threshold of 0.4 V at 0.14 ms. There were no complications during the implant. After implanting the new Micra, the first pacemaker was switched off with the Medtronic programmer. No interaction was observed between the two devices. The parameters of the new device remained stable at 2 months of follow-up. An echocardiogram ruled out a negative impact of RV systolic function, assessed by tricuspid annular plane systolic excursion and tissue Doppler imaging of the tricuspid valve annulus.

Conclusion

To our knowledge, this study represents the first successful case of multiple implants of a Micra TPS. Nevertheless, to conclude that this is a safe method and that a second Micra TPS can be implanted in a different location with no effects on RV and tricuspid valve function, systematics studies addressing this problem are needed.

Conflict of interest: none declared.

References

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