

Retrieval of an Infected Leadless Pacemaker

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INTRODUCTION

- Leadless pacemakers (LPs) are a viable alternative to traditional pacemakers when extraction of an infected pacing system is required
- The incidence of LP infection is rare
- Our case documents the rare occurrence of a Micra Transcatheter Pacemaker System infection and successful retrieval of this infected device 4 months after implantation

CASE PRESENTATION

- 37-year-old female with past medical history of Crohns disease and a pacemaker implanted for neurocardiogenic syncope
- Had extraction of two prior conventional pacing systems due to infection and ultimately had a LP inserted
- Presented to an outside facility with fever 4 months after LP insertion, treated with several rounds of antibiotics, and ultimately developed fungemia with *Candida albicans* requiring antifungal therapy
- Transferred to our hospital with ongoing fever and the decision was made to investigate the LP as the potential source of infection with intracardiac echocardiography (ICE) which demonstrated a 1.3 x 0.5cm frond-like material on the surface of the LP concerning for vegetation (*Figure 1*)

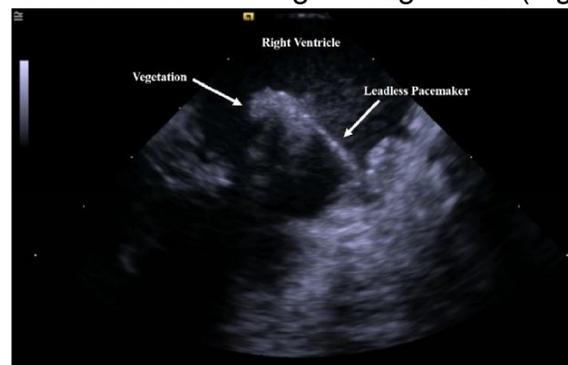


Figure 1. Intracardiac echocardiogram (ICE) image. The ICE catheter is positioned in the right ventricle, and it showed a large mobile vegetation attached to the pacemaker.

COURSE/RESULTS

- She was ultimately taken to the catheterization lab for LP extraction, which was successfully performed using a modified 28F Edwards venous cannula and a 6F Goose Neck Snare (*Figure 3*).
- The patient's blood cultures following extraction were negative and she remained clinical stable without need for pacemaker reimplantation.

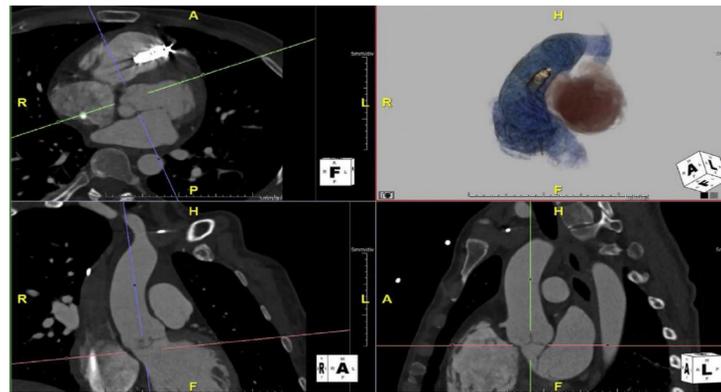


Figure 2. Pre-extraction chest computed tomographic scan. Three-dimensional reconstruction of the leadless pacemaker confirms its position in the right ventricular outflow tract.

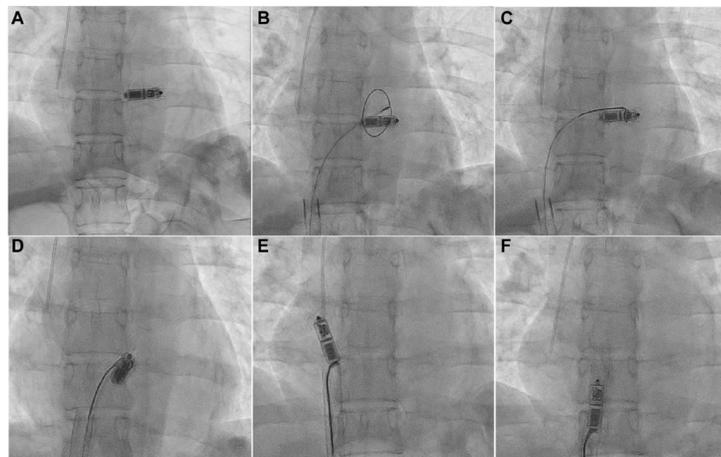


Figure 3. Device retrieval process under fluoroscopy. A: At the beginning of the procedure, the device was visualized on fluoroscopy. B: Under ultrasound guidance, a 28F Edwards venous cannula was inserted and advanced to the junction between the inferior vena cava and the right atrium. The system was advanced to the right ventricular outflow tract to deliver the snare and then pulled back as described in text. C: A snaring tool was advanced through the 28F cannula and grasped the leadless pacemaker. D-F: The device was then slowly retracted and pulled back into the cannula.

DISCUSSION

- LPs are emerging as a viable therapy for patients requiring ventricle pacing and have fewer complications compared to conventional pacing systems.
- Several trials have documented negligible infection rates after implantation of LP systems which may be attributed to the lower surface area, a bacterial resistant coating, no device pocket, turbulent right ventricle flow, and subsequent device encapsulation.
- To date there is only 1 other case report of documented Micra infection which was retrieved using the Micra delivery sheath.
- In our patient, a novel extraction methodology was used with a modified venous cannula thus avoid opening a new pacing system solely for the delivery sheath.
- The initial implant for our patient was for neurocardiogenic syncope and fortunately reimplantation was not required.

CONCLUSIONS

- This case documents the rare finding of a LP infection with successful retrieval of the device at 120 days post implantation with a novel approach to retrieval using a highly available 28F Edwards venous cannula (often used for extracorporeal membranous oxygenation) under ICE guidance

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