Removal of Leadless pacemaker using double snare catheter

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**Introduction**: A 90-years-old man, with a known history of Atrial fibrillation, hypertension, diabetes mellitus type2 and dementia, was diagnosed as having bradycardia of atrial fibrillation and received a permanent single-chamber pacemaker in the left prepectoral area 30years ago. However, he had lead fractures twice in the left side, and a pacemaker was inserted in the right prepector area 15years ago, and there were three leads in his body. At the time of the new admission to our hospital, a physical examination revealed adherence of skin to the device with overt erosion on the right side of his upper chest. A cardiovascular examination was unremarkable. No evidence of infective endocarditis was observed. He was performed an operation of exchange pacemaker generator on the right chest 2month before in our hospital. We diagnose an infection of pacemaker generator and decided to extraction the generator. As temporary pacemaker was implanted, the generator was extracted. At that time, blood culture was negative. Therefore, a leadless pacemaker was decided to implant in his right ventricle 2week after the operation. Three days later after the leadless pacemaker implantation, he got high fever and chest pain. We diagnose acute pneumoniae with chest CT images and blood examinations. However, some examinations showed not only pneumonia but also leadless pacemaker infection. In blood culture, MRSA was positive, and vegetation on the leadless pacemaker was observed by a transesophageal echocardiography. We treated with conservative antibiotic therapy and removal of pacemaker leads and leadless pacemaker.

**Methods**: We decided to removal of infected Micra about 4 months after implantation. We introduced a catheter transfemoral vein (Micra introducer: 23 Fr inner diameter, 27 Fr outer diameter, Medtronic Inc). Then we loaded a pair of 7 mm/175 cm snare (Amplatz goose neck, MERITMEDICAL) and introducer catheter (7Fr 98cm, XEMEX) to grab the head and the tail of the Micra, which was released from the septal myocardium while pushing the septal and pulling back the Micra.

**Result**: Micra was safely removed from the right ventricle (RV). No fibrosis and vegetation involving tines or body of Micra was observed. Echocardiogram after the operation excluded pericardial effusion.

**Conclusion**: The infected Micra about 4 months after implantation was able to extract from the RV because the leadless pacemaker was implanted on the septal wall of RV. If Micra was deployed at apex of RV, thin wall thickness of RV was difficult to extract it due to get higher risk of RV rupture.