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## A non-conventional approach to 10-year-delayed extraction of pacemaker leads associated with recurrent infective complications

To the Editor,

As the use of cardiac implantable electronic devices has increased, new techniques and tools have been developed to increase the safety of lead extraction (1, 2). While the relapse rate due to infection is 0% to 4.2%, when a complete removal is performed, this rate increases to 50% to 100% in a partial extraction (1, 3–5).

A 73-year old male was admitted due to a pacemaker pocket infection. During the first 2 years after implantation in 2007, early and severe recurrent infection in the pocket region had required 4 surgical interventions. On the occasion of the fifth, at the patient's request, the generator was removed, but the 2 leads were left in place. Ten years later, infectious signs recurred and compelled surgical intervention, but with a questionable outcome. On admission, inspection of the right deltopectoral region revealed multiple scars and a cutaneous fistula with purulent secretions.

Chest X-rays revealed active atrial and passive ventricular lead with missing connector blocks.

In our attempt to perform the lead extraction, we succeeded in revealing the leads using fine forceps. To apply a small degree of counter pressure at the tip of the right ventricular lead, we used an 8-F/23-cm catheter. The hemostatic valve was removed and the sheath was advanced into the right subclavian vein using the lead as the guidewire. Using gentle back and forth movements, we gradually increased the counter pressure at the tip of the lead with the sheath of the catheter, and we succeeded in displacing and extracting the lead. The same technique was attempted for atrial lead removal, but we could not pass the sheath into the superior vena cava due to considerable fibrosis between the lead and the subclavian vein. The tip of the atrial lead was successfully retracted, but the location was impassable at this level. The connector block of the lead was cut, and the internal coil was displaced, but insertion of a stylet only reached the tricuspid valve. Using a non-conventional approach, we decided to extract the inner coil using a 1.8-F flexible stone extraction basket (Olympus Corp., Tokyo, Japan) from the gastroenterology department. The extraction kit was introduced using a 9-F/10-cm catheter inserted into the contralateral subclavian vein, and we succeeded in extracting the internal coil, despite continuous movement of the coil tip. When the tip of the external coil reached the confluence of the right subclavian vein and the superior vena cava, we did not have enough room to manipulate the extraction kit. This drawback was overcome by replacing the basket extraction kit with Olympus flexible rat tooth grasping forceps. The complete extraction of the atrial lead was finally achieved via the same vascular access catheter from the left subclavian vein. Clinical evolution was favorable; the patient was without any signs of recurrent infection at 6 months after discharge.

Although we did not have the latest or most precise materials, using a non-conventional approach, we succeeded in extracting both leads without any adverse outcome. These results should be interpreted with thoughtfulness.

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