



Case report

Percutaneous extraction of implantable cardioverter defibrillator electrode with mechanical dilator sheath



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ABSTRACT

For removing the electrodes, manual simple traction may be useful and various methods have been used in extraction for chronically implanted electrodes. We report the case of successful percutaneous extraction of implantable cardioverter defibrillator electrode with Evolution mechanical dilator sheath.

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A 66-year-old man with ischemic cardiomyopathy who received a dual-chamber implantable cardioverter defibrillator (ICD) 7 years ago was referred to our hospital for the skin erosion causing protrusion of the lead portion secondary to infection. After detailed questioning, it was discovered that he had ICD pocket infection 3 years ago. ICD generator was removed and a new single-chamber ICD was implanted to contralateral pectoral region. Atrial and ventricular electrodes could not be removed due to fibrous adhesions at the contact points between electrodes and venous or cardiac walls. Proximal tips of these electrodes were fixed to the pectoral region. 2 months ago proximal tips of these electrodes were protruding after the skin erosion (Fig. 1).

Transvenous lead extraction procedure was performed in the cathlab under moderate sedation. After the skin dissection electrodes were separated from the scar tissue by blunt dissection. Atrial electrode was removed with manual traction. A locking stylet (Liberator Universal Locking Stylet, Cook Medical) and mechanical dilator sheath were used for ventricular lead. The Evolution mechanical dilator was positioned over the electrode. The dilator sheath was moved along the electrode body by cutting fibrous adhesion via the distal metal tip. Once the fibrous attachment is cut the outer sheath is advanced until another area of attachment is encountered. After the release of the electrode from fibrous tissue the electrode was pulled back into the sheath and removed (Figs. 2 and 3).

Electrodes of pacemaker or ICD usually undergo fibrotic encapsulation by activation of humoral and cellular immune response mechanisms after transvenous implantation.¹ For removing these electrodes, manual simple traction may be useful, however chronically implanted electrodes develop fibrous attachments to surrounding structures and require more advanced extraction systems.^{2,3} Various methods have been used in electrode extraction including manual traction, extended weight or forcep-assisted traction, radiofrequency or laser devices, mechanical extraction systems, and open-chest surgery.^{3,4} The mechanical method with a hand-powered sheath marketed as the Evolution can



Fig. 1. Protrusion of the electrodes after skin erosion.

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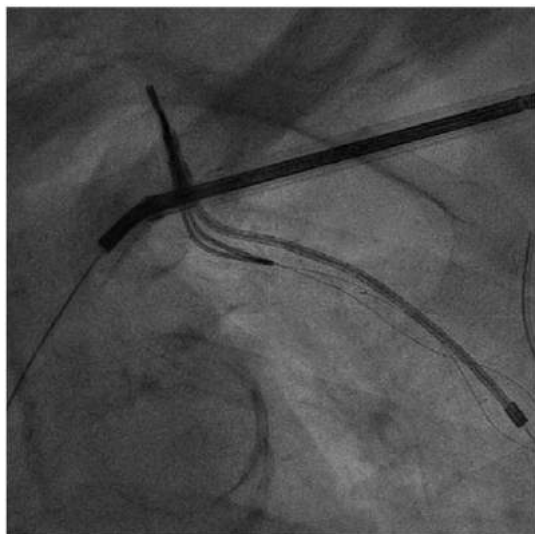


Fig. 2. Fluoroscopic view of the electrode covered by the Evolution sheath.



Fig. 3. Successfully extracted electrode.

be used as a useful method for chronically implanted ICD electrodes in high risk patients.

Conflict of interest

None.

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