

CASE REPORT

Combined LASER and femoral approach to remove a previous failure of Riata lead extraction

Antonio Dello Russo¹, Gaetano Michele Fassini¹, Sergio Conti¹, Giulia Vettor¹, Michela Casella¹, Fabrizio Tundo¹, Maurizio Roberto², Francesco Grillo², Francesco Alamanni² & Claudio Tondo¹

¹Cardiac Arrhythmia Research Center, Centro Cardiologico Monzino IRCCS, Milan, Italy

²Department of Cardiovascular Surgery, Centro Cardiologico Monzino IRCCS, Milan, Italy

Correspondence

Sergio Conti, Cardiac Arrhythmia Research Centre, Centro Cardiologico Monzino IRCCS, via Carlo Parea 4, 20138, Milan, Italy. Tel: (+39)0258002620; Fax: (+39)0258002782; E-mail: sergioconti.md@gmail.com

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A 75-year-old man received a dual-chamber pacemaker in 2007 that was upgraded to cardiac resynchronization therapy and defibrillator (CRT-D) system in 2011. He had history of dilated cardiomyopathy with reduced left ventricular ejection fraction (LVEF 30%), atrial fibrillation, aortic valve replacement with a mechanical prosthesis, and mitral valvuloplasty. Due to device pocket decubitus, without hyperpyrexia, but with evidence of vegetation on transesophageal echocardiography (TEE), the patient was admitted to undergo transvenous lead extraction (TLE). In this occasion, TLE [atrial and right ventricular leads, passive fixation; defibrillator lead, a Riata ST dual coil, active fixation (St. Jude Medical, MN, USA); left ventricle lead] was infructuous. The TLE attempt caused an evident externalization of the conductors in the intravascular tract proximal to the superior vena cava (SVC) coil. Moreover, the attempt to insert a locking stylet in all leads proved to be ineffective, and both mechanical and LASER sheath systems were unsuccessful due to the strong adherences in the anonymous vein–SVC junction. The leads were abandoned and secured into the pocket. Due to the high surgical risk, the cardiothoracic team refused the patient and he was referred to our center for a hybrid procedure.

Key Clinical Message

Transvenous extraction of Riata lead could be a challenging procedure due to insulation failure and conductor cables' externalization through the eroded outer insulation. In this case, a complete lead extraction was achieved through a combined LASER and femoral approach because of the massive conductors' externalization.

Keywords

Conductor externalization, hybrid procedure, insulation failure, LASER, lead extraction.

The procedure was performed under general anesthesia in a hybrid operating room. After a first ineffective attempt to insert a Liberator Locking Stylet (Cook Vascular, Inc., PA, USA), the Bulldog Lead Extender (Cook Vascular, Inc., PA, USA) was used to secure the lumenless leads. The pace–sense RV, atrial, and LV leads were successfully extracted using a 16Fr LASER sheath (Spectranetics). Differently, the Riata lead was unsuccessfully extracted due to the massive conductors' externalization at the proximal edge of the SVC coil (Fig. 1, Panel B). The externalized conductors created a “knot” which made impossible to retrieve the catheter inside the LASER sheath lumen. Thus, via the right femoral vein, a snare was inserted through a long deflectable sheath (Agilis 8.5F, St. Jude Medical, MN, USA) to straighten the tangle created by the conductors (Fig. 1, Panels C–D). After this maneuver, the SVC coil was easily retracted inside the lumen of the LASER sheath. The same issue was observed proximally to the RV coil and the maneuver was repeated to straighten the conductors (Fig. 1, Panel F). Once the lead was removed, the extensive conductors' externalization was evident as shown in Figure 2, Panels A and B.

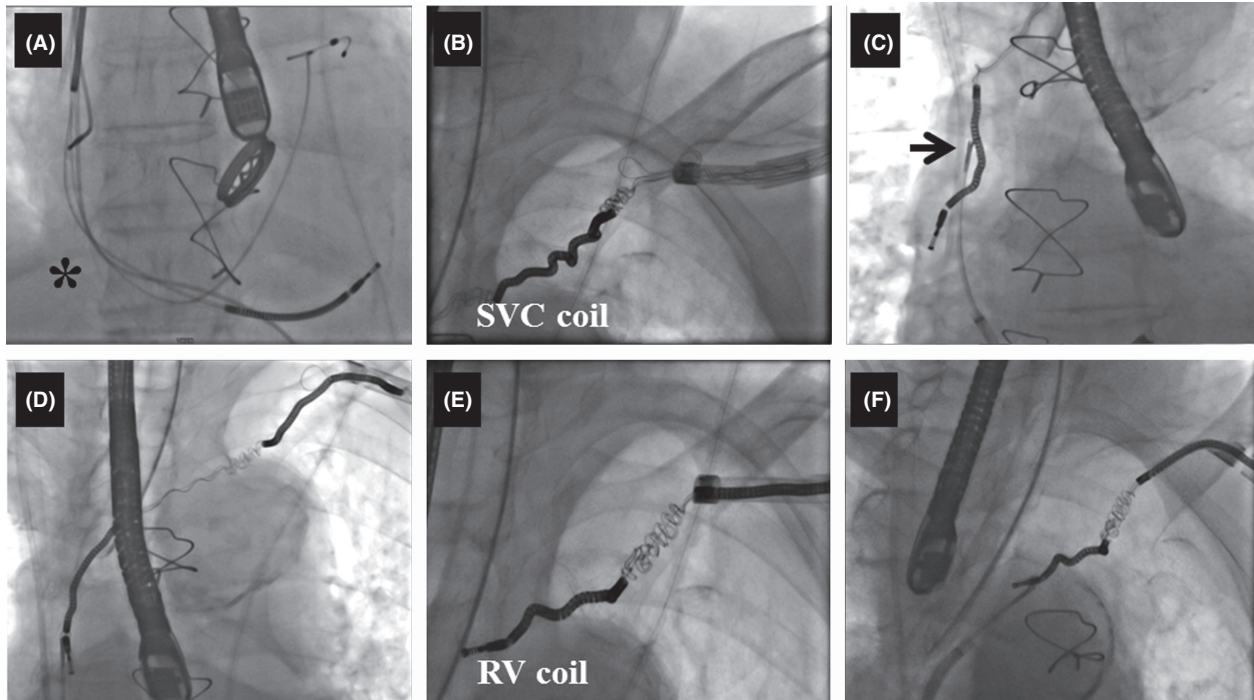


Figure 1. Panel A: Start of the lead extraction procedure, the black star highlights the conductors' externalization. Panel B: Proximally to the SVC coil, a bulky "knot" created by the externalized conductors has impeded the progression of the lead inside the LASER sheath. Panel C: Using a snare, black arrow, the lead has been straightened and then advanced inside the LASER sheath, Panel D. The same maneuver was performed to retract the RV coil, Panels E–F.

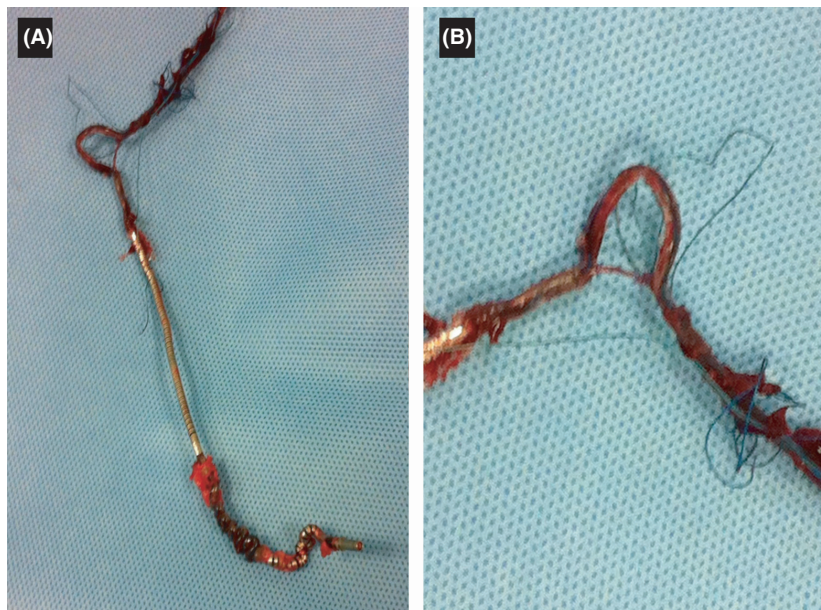


Figure 2. Panels A–B. Riata ST lead extracted. The extensive adhesions and the massive externalization of the conductors are evident.

Discussion

Although safe in expert hands, TLE remains a high-risk procedure especially in low volume centers and for

nonskilled operators. Multiple tools and devices are mandatory to properly manage these cases. On November 2011, the Riata's manufacturer St. Jude Medical Inc. released a physician advisory notice about a recall of Riata

and Riata ST silicone-insulated leads. The main issue of Riata leads is the conductor cables' externalization through the eroded outer silicone insulation [1]. Riata TLE is recommended in cases of insulation failure observed using fluoroscopy screening and in addition to evidence of abnormal electrical functioning. However, due to the high risk related to TLE, a conservative approach has been also described [2]. In the case hereby reported, the patient was scheduled for TLE due to both device pocket decubitus and presence of vegetation on TEE. Although LASER-powered sheath has been proven to be effective to perform Riata lead extraction [3, 4], removal of a failed lead with conductors' externalization can cause procedure complications including rupture and incomplete extraction. A combined subclavian and femoral approach was necessary to remove the tangle created by the externalized conductors of the Riata lead. In particular, three different available tools were used for TLE: LASER sheath, a Locking Bulldog Lead Extender, and a snare through the femoral vein to straighten the tangle of the lead.

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Conflict of Interest

None declared.

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