

# Implantable Cardioverter-Defibrillator Lead in an Explanted Human Heart

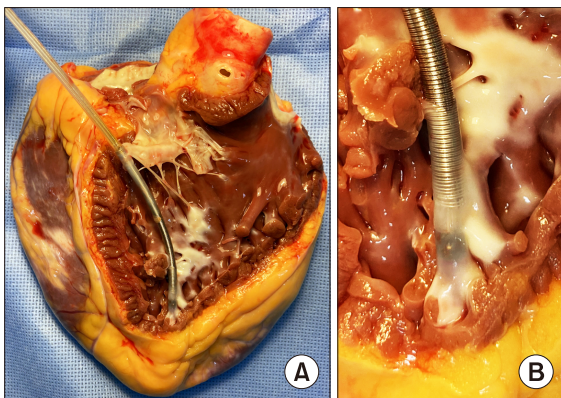
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A 64-year-old man who had suffered from ischemic cardiomyopathy underwent heart transplantation. He had undergone a coronary intervention for myocardial infarction 3 years earlier. His left ventricular systolic function had gradually decreased, and he had received an implantable cardioverter defibrillator (ICD) 6 months earlier for the primary prevention of sudden cardiac death. The right ventricle (RV) of the explanted failing heart was dissected. After the RV free-wall dissection, the ICD lead was visible. The lead body adhered to the tricuspid valve leaflets, and the tip was fixed near the RV apex (Fig. 1A). The fibrotic change in the RV septum was assumed to be related to the mechanical irritation of the endocardium by the ICD lead. The lead tip was embedded via fibrotic encapsulation (Fig. 1B), which often renders the lead extraction challenging.

Adhesion between ICD lead and cardiovascular structures occurs usually at the venous entry, SVC and cardiac chamber. The images show two of three frequent lead adhesion sites.<sup>1,2</sup> The integrity and reliability of cardiac implantable devices are important to perform life-sustaining therapies. Therefore, leads must tolerate the physical stress of cardiac contraction and biological environment in the cardiovascular system. In this context, lead design has continuously improved. However, many studies have reported substantial rates of leads failure.<sup>3</sup> This case showed how the leads of implantable cardiac devices adhered to cardiovascular system and the results of the mechanical irritation of the leads in the heart. In addition, when lead failure occurred, this image warned that simply pulling leads out would be very dangerous potentially resulting in catastrophe such as RV invagination, large venous system tearing, or cardiac rupture because of adhesion to near structures.



**FIG. 1.** After dissection of right ventricle free-wall, the ICD lead was visible. The lead body adhered to the tricuspid valve leaflets, and the tip was fixed near the right ventricle apex (A). The fibrotic change in the right ventricular septum was assumed to be related to the mechanical irritation of the endocardium by the ICD lead. The lead tip was embedded by fibrotic encapsulation (B), which often renders the lead extraction challenging.

## CONFLICT OF INTEREST STATEMENT

None declared.

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