Perforation of the Left Atrial Appendage Caused by Inadvertent Deployment of a Soft J-Tipped Guidewire During Radiofrequency Hot-Balloon Ablation

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A 78-year-old male patient with a history of highly symptomatic paroxysmal atrial fibrillation underwent pulmonary vein (PV) isolation (PVI) using a radiofrequency hot-balloon (RHB) catheter (SATAKE Hot-Balloon, Toray Industries, Tokyo, Japan). After simultaneous PV angiography (Figure 1A) and successful isolation of the right PV, isolation of the left superior PV (LSPV) was attempted. Initially, a soft J-tipped guidewire (Spring Guide Wire, Toray Industries, Tokyo, Japan) was advanced into the upper branch of the LSPV (Figure 1B) and energy was applied for 240 s at 70°C. Residual conduction of the LSPV was found at the anterior carina, and further energy application at the left inferior PV (LIPV) isolated the LSPV (“cross-talk” phenomenon; Figure 1C). Re-conduction of the LSPV was observed after the termination of energy delivery. Therefore, we advanced the...
guidewire into the first branch of the LSPV, directing it in the anterior-inferior direction to achieve better contact of the RHB against the LSPV anterior carina. During the first attempt, the guidewire was advanced without complications beyond the cardiac silhouette under fluoroscopy guidance and was assumed to be in the target branch. Selective angiography from the tip of the RHB demonstrated leakage of contrast media into the pericardial space, and the appearance of pectinate muscles suggested that the tip of the RHB perforated the floor of the left atrial appendage (LAA; Figure 2). The guidewire was left in the pericardial space and a touch-up ablation using an irrigated radiofrequency ablation catheter eliminated the residual conduction space and a touch-up ablation using an irrigated radiofrequency ablation catheter eliminated the residual conduction frequency ablation catheter prevented migration between the pectinate muscles, where the wall was paper thin, and may have easily perforated the LAA floor. Moreover, the stiff proximal part of the guidewire may have increased the force of the soft-J tipped guidewire. As already used with the cryoballoon, the circular mapping catheter prevents migration between the pectinate muscles, while the recording of a local signal helps the operator recognize the inadvertent deployment of the catheter into the LAA. The development of an inner circular mapping catheter or a guidewire with the capability of recording a local signal designed specifically for the RHB may help to maintain the coaxial position and reduce the risk of trauma during manipulation.

Disclosures
K.A. belongs to the endowed department of Toray Industries. The other authors declare no conflict of interest.

References