Silent Cardiac Perforation During Visually Guided Laser Balloon Ablation

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A 36-year-old man with atrial fibrillation underwent visually guided laser balloon (VGLB) ablation (CardioFocus Inc, Marlborough, MA, USA). After circumferential energy application, isolation of the left superior pulmonary vein (LSPV) was achieved at the anterior carina (12W, 67s) but was transient. Subsequent energy application (12W, 20s) on the contralateral side of the left inferior pulmonary vein (LIPV) successfully isolated the LSPV (“cross-talk” phenomenon); however, a gradually expanding black spot was noted behind the balloon at the anterior ridge (Figure A, yellow arrows). On fluoroscopy, extravasation of the contrast media into the pericardial space was observed (Figure B, black arrows, Supplementary Movie). Pinhole rupture of the balloon with extravasation of the inner contrast media directly into the pericardial space was suspected. The patient remained hemodynamically and neurologically stable after balloon deflation. A magnified view of the VGLB demonstrated that the pinholes coincided with the LIPV anterior carina energy application sites (Figure C, red arrows).

Pinholes typically result in leakage of contrast media into the left atrium rather than into the pericardial space. Although the precise mechanism of the extravasation is unknown, repeated high-energy applications at the LSPV anterior carina may have increased myocardial vulnerability, and subsequent energy application on the contralateral side resulted in development of the pinholes and further myocardial damage. Consequently, contrast media leakage occurred via the stretched, vulnerable myocardium without apparent cardiac perforation on endoscopy. Considering that it is not possible to monitor lesion size with VGLB ablation, it should be emphasized that repeated high-energy applications in confined areas may increase the risk of cardiac perforations.

Disclosures
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Reference

Supplementary Files
Supplementary Movie. Extravasation of the inner contrast media directly into the pericardial space.
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Figure. (A) Endoscopic views during energy applications. (B) Extravasation of the inner contrast media into the pericardial space. (C) A magnified view of the visually guided laser balloon with pinholes (red arrows). LIPV, left inferior pulmonary vein; LSPV, left superior pulmonary vein; VGLB, visually guided laser balloon.