Constrictive Pericarditis After Catheter Ablation for Atrial Fibrillation

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A 70-year-old man with paroxysmal atrial fibrillation was referred for pulmonary vein isolation. Past medical history included ischemic heart disease and a right hemicolectomy for Duke’s C carcinoma 10 years previously. Presenting ECG showed sinus rhythm with a normal axis and evidence of left atrial enlargement (Figure 1). Preoperative echocardiography demonstrated normal left ventricular structure and function. After routine single transseptal puncture, retrograde pulmonary venography was performed. This demonstrated 2 large right pulmonary veins and a left common pulmonary vein. Subsequently, an uncomplicated wide-area circumferential ablation of the pulmonary vein antra and right atrial isthmus ablation were performed successfully.

Three months postoperatively, the patient developed marked dyspnea with an elevated jugular venous pressure and ankle edema. Chest x-ray (Figure 2) showed pleural effusions and upper lobe blood diversion. Echocardiography demonstrated normal left ventricular function but showed pericardial thickening. Cardiovascular magnetic resonance imaging excluded pulmonary vein stenosis but demonstrated circumferential pericardial thickening to a maximum of 1 cm and ventricular interdependence with inspiratory septal flattening on real-time imaging, characteristic of constrictive pericarditis.

Initial medical management with diuretics and oral prednisolone only partly resolved signs and symptoms. Successive cardiovascular magnetic resonance imaging (Figure 3) demonstrated a reduction in pericardial thickness to 0.4 cm, but the constriction (effusions and ventricular interdependence) persisted. Pericardectomy was performed. The pericardium was thick and adherent. Stripping resulted in immediate hemodynamic benefit with normalization of right atrial pressures and ventricular function on transesophageal echocardiography. Pericardial histology was consistent with postinflammatory pericarditis with no evidence of neoplasia. After a rapid postoperative recovery, clinical improvement was sustained. Repeat cardiovascular magnetic resonance imaging showed complete resolution of constrictive physiology with minimal residual redundant pericardium.

To the best of our knowledge, acute constrictive pericarditis occurring as a result of catheter ablation for atrial fibrillation has not been previously reported, but it should be included in the differential diagnosis of dyspnea after catheter ablation, along with pulmonary vein stenosis and diaphragmatic paralysis.

Disclosures

None.

Figure 1. Presenting ECGs. Sinus rhythm (left) and atrial fibrillation (bottom).
Figure 2. Posteroanterior chest x-ray showing blunting of the left costophrenic angle and increased pleural thickening in the right midzone consistent with pleural effusions. Upper lobe blood diversion and an increased cardiothoracic ratio can also be seen.

Figure 3. Top, Anatomy: circumferential pericardial thickening without effusion, which thins with time/steroids before removal with stripping (some residual pericardium remains inferiorly). Bottom, Physiology: Real-time cardiovascular magnetic resonance images during expiration (exp) and inspiration (insp). Ventricular interdependence is noted, with inspiratory septal flattening despite anatomic resolution, resolving only with pericardial stripping (post-op).