Atrial fibrillation originating from persistent left superior vena cava.

BACKGROUND: The left superior vena cava (LSVC) is the embryological precursor of the ligament of Marshall, which has been implicated in the initiation and maintenance of atrial fibrillation (AF). Rarely, the LSVC may persist and has been associated with some organized arrhythmias, though not with AF. We report 5 patients in whom the LSVC was a source of ectopy, initiating AF.

METHODS AND RESULTS: In 5 patients (4 men; age, 46 +/- 11 years) with symptomatic drug-refractory AF, ectopy from the LSVC resulting in AF was observed after pulmonary vein isolation. The ectopics were spontaneous in 2 and induced by isoproterenol in the others and preceded P-wave onset by 67 +/- 13 ms. During multielectrode or electroanatomic mapping, venous potentials were recorded circumferentially at the proximal LSVC near its junction with the coronary sinus (CS), but at the mid-LSVC level, they were recorded only on part of the circumference. The LSVC was electrically connected to the lateral left atrium (LA) and through the CS to the right atrium, with 4.1 +/- 2.3 CS-LSVC and 1.6 +/- 0.5 LA-LSVC connections per patient. Catheter ablation in the LSVC targeting these connections resulted in electrical isolation in 4 of the 5 patients without complications. After 15 +/- 10 months, the 4 patients with successful isolation, including 1 who had...
successful reablation for LA flutter, remained in sinus rhythm without drugs. CONCLUSIONS: The LSVC can be the arrhythmogenic source of AF with connections to the CS and LA. Ablation of these connections resulted in electrical isolation.