Atrial impulse-triggered echo beats associated with residual conduction gap after pulmonary vein isolation

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Introduction: n.a

Methods: n.a

Result: A 70-year-old man with a history of peripheral arterial embolism underwent contact force-guided radiofrequency catheter ablation for paroxysmal atrial fibrillation (AF). After anatomical encirclement of 4 pulmonary veins (PVs), residual PV potentials were observed in the left superior PV (LSPV). During pacing from the distal coronary sinus (CS) at a cycle length of 750 ms, atrial premature beats (trigeminy) appeared with exactly the same coupling interval (beats 3, 6, 9 in figure). Close observation showed that there were 2 or 3 PV potentials (P1-P3 in figure) in the atrial-paced beats (1, 2, 4, 5, 7, 8). It seemed independent of each potentials (P1, P2, P3) in activation sequences (P2 was observed only in the distal and proximal electrode), but the P1, P2, and P3 were always lined up. The P1-P2 interval was slightly shorter in beats after compensatory pause (beats 1, 4, 7) (235 ms) than in beats 2, 5, 8 (245 ms), suggesting decremental conduction between P1 and P2. The P2-P3 interval remained constant (135 ms). Radiofrequency application at the anterior carina of the LSPV resulted in electrical isolation of the LSPV. These findings indicated the presence of 2 or more conduction pathways partially including slow conduction within the LSPV, which may have caused intra-PV reentry.

Conclusion: Our case suggested that the constant atrial impulse itself can trigger atrial arrhythmias via residual conduction gap after PV isolation.