To shock or not to shock? Parasystole of the left atrial appendage mimicking sinus rhythm at TEE-guided cardioversion

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A 60-year-old man presented with recurrent flutter after ablation. On pre-cardioversion transoesophageal echocardiography (TEE), the left atrial appendage (LAA) had regular contractions before ventricular systole (Panel A and see Supplementary data online, Movie S1), with associated late diastolic mitral inflow (Panel B), mimicking sinus rhythm. Pulsed-wave Doppler demonstrated high velocity emptying (Panel C, arrow) with superimposed low-velocity flutter waves. One of the LAA lobes had flutter-like contractions (see Supplementary data online, Movie S1, arrow). Electrocardiogram (ECG) showed atrial flutter waves in V1 (Panel D, blue arrows), and positive deflections just prior to QRS in lead II (red arrows). Post-cardioversion LAA demonstrated two emptying phases for each ventricular systole (Panel E and see Supplementary data online, Movie S2). Findings were confirmed on pulsed-wave Doppler with two late filling phases on mitral inflow (‘double’ A-waves; Panel F) and two emptying phases of the LAA (Panel G, arrows). One phase occurred after the p-wave (vertical bars) and one before it, reflecting persistent LAA parasystole (Panel G). ECG confirmed sinus rhythm; and the shoulder before QRS in lead II disappeared (Panel H).

We hypothesize that the dominant atrial rhythm was conducted to the main body of the LAA, while flutter originating in an electrically isolated left atrial region was transmitted to a side lobe of the LAA.

Our observations highlight the possibility of atrial flutter or fibrillation involving the LAA or another isolated area of the left atrium despite electrocardiographic evidence of regular atrial activity and pseudo-normal Doppler mitral flow profile. This finding has major therapeutic implications, as undiagnosed atrial fibrillation could lead to the cessation of anticoagulant therapy and potentially increase thromboembolic events.

Supplementary data are available at European Heart Journal — Cardiovascular Imaging online.