Lower-Loop Reentrant Atrial Flutter

A Aslani¹, M Khalili², M Haghjoo²

¹Cardiovascular Research Center, Shiraz University of Medical Sciences, Shiraz, ²Department of Pacemaker and Electrophysiology, Shaheed Rajaie Cardiovascular Center, Tehran University of Medical Sciences, Tehran, Iran

The mechanism of typical atrial flutter (AFL) has been well established. The isthmus between the tricuspid annulus and Eustachian ridge has been recognized as a critical part for maintaining the typical AFL circuit and the target site for ablation. However, a subtype of AFL, as double-wave reentry [lower loop reentry], has been described. This arrhythmia is due to the presence of 2 activation wavefronts rotating simultaneously. In this case report, we presented a case of counter-clockwise AFL with such activation circuit.

Keywords: Atrial Flutter, Double Wave Reentry, Lower Loop Reentry

Introduction
The mechanism of typical atrial flutter (AFL) has been well studied. The isthmus between the tricuspid annulus and Eustachian ridge has been recognized as a critical portion of the typical AFL circuit and the target site for ablation. However, a subtype of AFL, classified as double-wave reentry [lower loop reentry] that is due to the presence of 2 activation wave fronts rotating simultaneously, was described. In this case report, we described a case of counter-clockwise AFL with 2 activation waterfronts rotating simultaneously in the reentrant circuit of typical AFL.

Case Presentation
A 51-year-old man with a clinical diagnosis of counter-clockwise AFL based on ECG criteria was referred to Electrophysiology Laboratory for ablation. Antiarrhythmic medications were discontinued at least 5 half-lives before the procedure. Venous access was obtained with 7F and 8F sheaths in the right and left femoral veins. A 10-pole catheter was introduced anterior to the crista terminalis while its distal tip at the lower right atrial lateral free wall. A radiofrequency ablation catheter was used to carry out entrainment at the various sites within the right atrium. Underpinned by typical endocardial activation sequence and evidence of entrainment from the isthmus, diagnosis of clockwise AFL was established [Figure-1]. Spontaneous episodes of lower loop reentry with similar wave morphology and 2 different cycle lengths were detected throughout counterclockwise AFL. The longer cycle length was associated with the counterclockwise AFL and the shorter one with lower loop reentry [Fig.2]. After the baseline study, successful radiofrequency ablation was done during tachycardia with a linear lesion from the tricuspid annulus to the Eustachian ridge. The temperature was set at 60°C to 65°C with maximum power of 50 W. Bidirectional conduction block in the isthmus was the end point of ablation.

Discussion
The area between tricuspid annulus and Eustachian ridge has been recognized as a critical isthmus of the typical AFL circuit and is the target site for ablative therapy. Lower loop reentry is due to the presence of 2 activation wavefronts rotating simultaneously in the reentrant circuit of typical AFL. Lower loop reentry defined as a macro-reentrant...
tachycardia maintained by circus movement of the activation wavefront around the inferior vena cava instead of tricuspid annulus. Lower loop reentry uses the same isthmus between the tricuspid annulus and inferior vena cava as in AFL and therefore is similarly amendable by linear ablation of that isthmus.

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References