

## Syncope: As a Rare Presenting Feature of Atrial Flutter

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A 42-years-old woman presented with palpitation. Her symptoms aggravated since 2 years ago, and developed palpitation and syncope during its last six months. Her symptoms continued despite the medical therapy. During heart monitoring in CCU, she developed a narrow QRS complex tachycardia with rate of 150 beats/min. After injection of adenosine, ventricular rate slowed down and the flutter waves were appeared. In electrophysiology study (EPS), reverse atrial flutter was induced. Bidirectional cavotricuspid isthmus block by application of radiofrequency energy was done for her. No arrhythmia was induced after radiofrequency ablation. The patient was discharged and during follow up is free of symptoms.

### Introduction

**A**trial flutter (AF) is the most common type of macroreentrant atrial tachycardia. Typical atrial flutter is a reentrant rhythm in the right atrium constrained anteriorly by the tricuspid annulus and posteriorly by the crista terminalis and eustachian ridge.<sup>1,2</sup> The flutter can circulate in a counterclockwise direction around the tricuspid annulus in the frontal plane (typical flutter) or in a clockwise direction (reverse flutter).<sup>2,3</sup> Other forms of atrial flutter are now recognized as distinct types and include atrial macroreentry caused by incisional scars from prior atrial surgery.<sup>4,5</sup> The atrial rate during typical atrial flutter is usually 250 to 350 beats/min with ventricular rate half that of the atrial rate. The most clinical presentation of patients with AF is palpitation. Syncope is a rare presentation in patients with AF. Cardioversion is commonly the initial treatment of choice for atrial

flutter because it promptly and effectively restores sinus rhythm.

### Case report

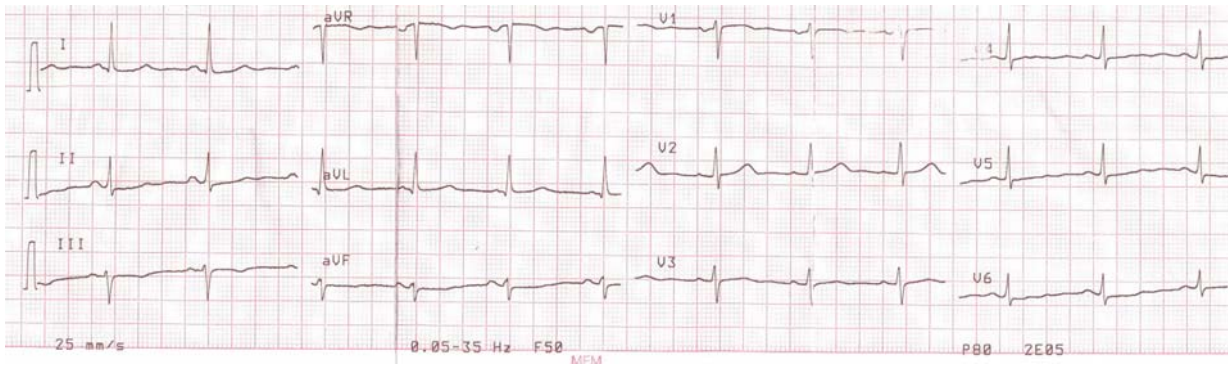
A 42-years-old woman presented with episodes of palpitation for 8 years. Frequency of symptomatic episodes was increase, 7-8 times palpitation per year, since 2 years ago, and developed palpitation associate with syncope during last six months. The patient was under cardiologist follow up and received medical therapy (verapamil 40mg po Bid). EKG was normal. (Fig. 1) Work up for thyroid and others problems were normal. Her symptoms continued despite the medical therapy. The patient was admitted to CCU for evaluation and management. During heart monitoring in CCU she developed a narrow QRS complex tachycardia with rate of 150 beat/min.(Fig. 2) After injections of 12mg adenosine, ventricular rate slowed down and the flutter waves appeared on EKG monitoring and after afew mintues arrhythmia was converted spontaneously to sinus

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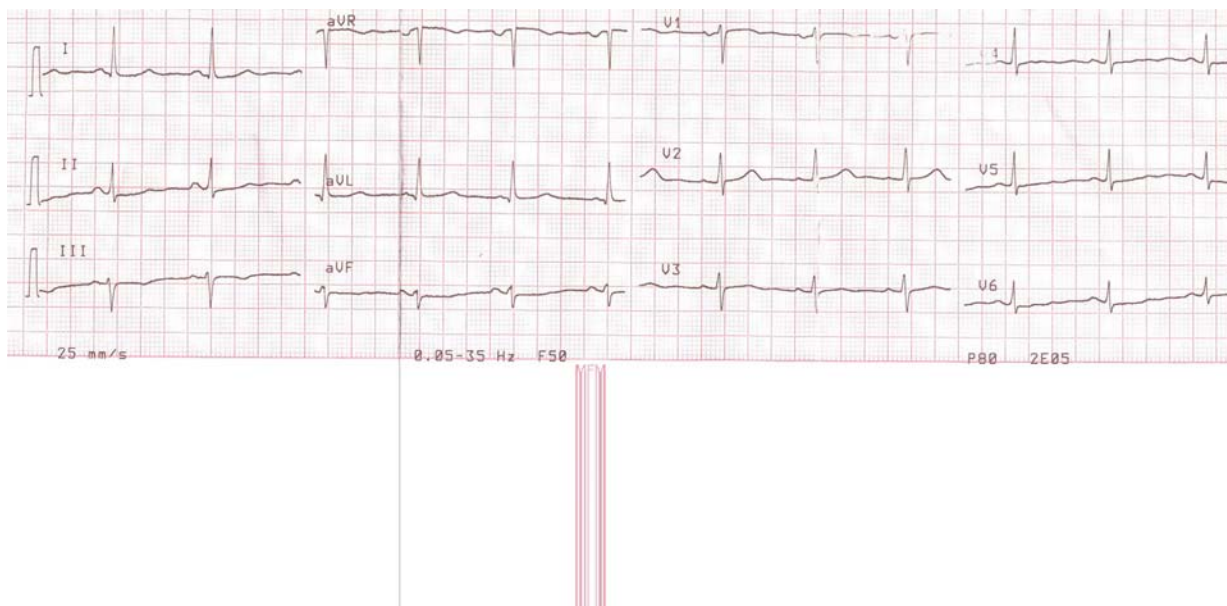
**Figure 1.** EKG shows normal sinus rhythm.

rhythm. After consultation with an electrophysiologist, the patient was subjected to electrophysiology study (EPS), during which by rapid atrial pacing, reverse atrial flutter was induced (Fig. 3) which was degenerated rapidly to atrial fibrillation and then to sinus rhythm subsequently. Following bidirectional cavotricuspid isthmus block by application of radiofrequency energy, no arrhythmia was inducible. The patient discharged after conversion of atrial fibrillation to sinus rhythm. She was subsequently visited after one week, two weeks, one month

and 6 months during which she was found to be asymptomatic and having an uneventfully happy life.

### Discussion

Atrial flutter is less common than atrial fibrillation. It can occur as a result of atrial dilation from septal defects, pulmonary emboli, mitral or tricuspid valve stenosis or regurgitation, or chronic ventricular failure but can also rarely occur without underlying heart disease. Toxic and metabolic conditions affecting the heart, such



**Figure 2.** EKG showing narrow QRS complex tachycardia with rate of 150 beat/min.



**Figure 3.** Tracing shows Reverse typical atrial flutter during electrophysiologic study. A “halo” catheter with 10 electrode pairs is situated on the atrial side of the tricuspid annulus.

as thyrotoxicosis, alcoholism, and pericarditis, can cause atrial flutter. In pediatric patients with the preexcitation syndrome, in occasional patients with hyperthyroidism, and in those whose AV nodes conduct rapidly, atrial flutter can conduct to the ventricle in a 1:1 fashion and produce a ventricular rate of 300 beats/min. The patient with AF almost always present with palpitation.<sup>1</sup> Syncope is a rare presentation in AF, except in patients whose AF conduct to the ventricle in a 1:1 fashion produces a ventricular rate of 300 beats/min, a rapid ventricular rate causing decreasing blood pressure followed by syncope due to decrease brain perfusion. In one patient having mitral valve prolaps (MVP), atrial flutter and syncope have been reported.<sup>6</sup> Also recurrent syncope and atrial flutter is a clinical presentation of Kearns-Sayre syndrome, a rare disease linked to mitochondrial inheritance.<sup>7</sup> In this case

the patient had palpitation with syncope and electrophysiologic study did not show any evidence of accessory pathway. Also the patient had no thyroid problem. Induction of atrial flutter in electrophysiologic study is always a significant finding and can not be regarded as an incidental event. In the absence of evidence of other arrhythmic causes of syncope in this patient, detection of atrial flutter can be considered as a cause of syncope. However, the patient was discharged following ablation of atrial flutter with no subsequent symptom developing after 6 months follow up; atrial flutter was probably the cause of syncope in this patient. Prevention of recurrent AF is often difficult to achieve medically. RF catheter ablation of flutter (counterclockwise and clockwise) is highly effective in curing atrial flutter and has a long term success rate of 90 to 100 percent. As ablation of AF is an efficient procedure, with little

risk, it can be offered as an alternative treatment to drug therapy.

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