



## Atrial Fibrillation Triggered by Theophylline: a Case Report Treated with “Pill in the Pocket”

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### Abstract

Atrial fibrillation (AF) is the most common sustained arrhythmia and the prevalence of AF increases with age. Ageing, hypertension, coronary artery disease, heart failure, diabetes mellitus, valvular heart diseases, congenital heart defects, thyroid dysfunctions, chronic obstructive pulmonary disease, drugs and alcohol are associated with atrial fibrillation. New-onset AF can be converted to sinus rhythm. “Pill in the Pocket” administration can be effective in new-onset AF. Herein, we present a new-onset AF was triggered by drug (theophylline) and converted with oral propafenone instead of electrical cardioversion or pharmacological conversion with I.V. drugs.

### Learning Objectives

- Drugs can trigger atrial fibrillation
- Tachycardia is the most common symptom of atrial fibrillation
- New onset atrial fibrillation can be converted under anticoagulation prophylaxis
- Pill in the pocket administration is a method for conversion to sinus rhythm

### Keywords

Atrial fibrillation, Theophylline, Propafenone

### Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia, occurring in 1–2% of the general population [1]. The prevalence of AF increases with age, from, 0.5% at 40–50 years, 5–15% at 80 years [2]. Atrial fibrillation is more seen in male patients than female. Ageing, hypertension, coronary artery disease, heart failure, diabetes mellitus, valvular heart diseases, atrial septal defects and other congenital heart defects, thyroid dysfunctions, chronic obstructive pulmonary disease, drugs and alcohol are the most conditions associated with atrial fibrillation. In this case, AF was triggered by theophylline and sinus rhythm was maintained by pill-in-the-pocket method.

### Case Report

66 years old woman was admitted to our ER with tachycardia and dyspnea at the afternoon. She had medical history of Chronic Obstructive Pulmonary Disease (COPD) and Hypertension (HT), and was taking tiotropium bromide and combination of budesonide and formoterol for COPD, combination of trandolapril and verapamil for HT. Coronary artery disease, cerebrovascular events peripheral vascular disease were not placed in her medical history. In the morning of the same day, theophylline was added to medical treatment by general practitioner with sinus rhythm on Electrocardiogram (ECG) and tachycardia had started after taking 400mg theophylline. On physical examination, rhonchus was audible on both of hemithorax, any cardiac murmur or rales was not heard. Her chest X-ray was unremarkable. Electrocardiogram (ECG) at the time of tachycardia showed atrial fibrillation with rapid ventricular response, heart rate was 130–140 beats per minute without any other abnormalities. Echocardiography revealed normal left and right ventricular sizes and functions, normal left and right atrial sizes, normal aortic valve, mild mitral valve regurgitation and mild tricuspid valve regurgitation. Weight-adjusted therapeutic dose of enoxaparine was given subcutaneously, after that oral 600mg propafenone was given by orally. Twenty minutes after taking propafenone, sinus rhythm was obtained with 80 beats per minute. We started and continued oral anticoagulation (with LMWH and warfarine) after medical cardioversion according to CHADSVA Sc Score (CAHDSVA Sc score=3 (hypertension, 66 years, female gender)). Sinus rhythm was maintained with propafenone 300 mg per day for three months.

### Discussion

Atrial fibrillation is the most common arrhythmia, affects 1–2% of the population and this figure is likely to increase with ageing. Hospitalizations that associated with AF, account for one-third of all admissions for cardiac arrhythmias. Stroke is often severe and results in long-term disability or death. Quality of life and exercise capacity are impaired in patients with rapid ventricular response in AF [3].

The time of onset of AF should be established to treat. Most patients with AF <48 hours in duration can be cardioverted on low molecular weight heparin reducing the risk for stroke. Eligible patients

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- for the cardioversion - should not have a history of left ventricular dysfunction and should not have valvular or ischaemic heart disease, and they should have a history of infrequent symptomatic episodes of paroxysmal atrial fibrillation [3].

If AF duration is >48 hours or there is suspicion about its duration, transesophageal echocardiography may be used to rule out intracardiac thrombus prior to cardioversion, although it can be difficult in patients in acute distress and may not be available in emergency settings [4].

Theophylline, also known as 1,3-dimethylxanthine, is a methylxanthine drug, has structural and pharmacological similarity to caffeine. Theophylline is nonselective adenosine receptor antagonist, which explains many of its cardiac effects [5,6].

In this case, atrial fibrillation began after taking theophylline. Patient had short duration (<48 hours) of AF episode, her hemodynamic status has been stabilized then we decided to cardiovert the rhythm to sinus with medically. Some I.V. agents as amiodarone, flekainide, ibutilide, propafenone and vernakalant can be used for pharmacological conversion of (recent-onset) AF, we tried to use "pill-in-the-pocket" approach. Oral administration of flekainide or propafenone may be effective for recent-onset AF. We obtained sinus rhythm with 600mg of propafenone, and maintained the rhythm with 300mg propafenone per day. The significant point of follow-up period in AF is protection from thromboembolism and stroke. The patient had CHADVASC Score >2 and we started oral anticoagulation after conversion of AF and continued [4].

In conclusion, atrial fibrillation can be triggered by some drugs as theophylline, for selected patients, "pill in the pocket administration" is feasible and reduces hospital admissions and emergency department visits [7].

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