

## Persistent recurring adenosine-sensitive TA during pregnancy

# Management of a recurrent pregnancy-related incessant adenosine-sensitive atrial tachycardia

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## Summary

A 27-year-old pregnant woman (29th week) reported palpitations, dizziness and exertional dyspnoea. The heart rate was 130 bpm at rest, up to 180 bpm during mild exertion, without haemodynamic compromise. The electrocardiogram (ECG) showed atrial tachycardia. An adenosine intermittent interruption of the atrial tachycardia was observed. Metoprolol combined with flecainide controlled the ventricular rate to 80–85 bpm followed by conversion to sinus rhythm. The patient stayed asymptomatic until a second pregnancy, when the same atrial tachycardia recurred. Symptoms were controlled by combining metoprolol and flecainide at an earlier stage.

## Introduction

Cardiac arrhythmias are relatively rare during pregnancy. Atrio-ventricular re-entry supraventricular tachycardia (AVNRT) is most frequently encountered in this setting [1]. Atrial tachycardia during pregnancy is however rare. Managing such arrhythmias remains a challenge. The case of a recurring pregnancy-related incessant atrial tachycardia is presented.

## Case presentation

A 27-year-old female, 29 weeks into her first pregnancy, presented herself with complaints of palpitations, dizziness and exertional dyspnoea. The patient denied any previous history or symptoms of cardiac, pulmonary or other

medical conditions before the pregnancy. At admission, the heart rate was 130 bpm at rest and peaked to 180 bpm during exertion, without signs of haemodynamic instability. The electrocardiogram (ECG) showed a narrow QRS complex supraventricular tachycardia (fig. 1A). A 24-hour Holter ECG showed persistence of the arrhythmia with a median heart rate of 120 bpm, minimum 90 bpm, maximum 187 bpm. With adenosine 6 mg intravenously, reversion to sinus rhythm was achieved, followed by immediate recurrence of the atrial tachycardia (fig. 1B). Anaemia and hyperthyroidism were excluded. Echocardiography revealed no structural heart abnormalities.

During the tachycardia, atrial wave polarity, RP>PR intervals, and tachycardia response

during autonomous nervous system modulation ruled out AVRT or AVNRT, and indicated adenosine-sensitive atrial tachycardia (fig. 1B).

Progressively increasing dosages of metoprolol to 100 mg controlled the ventricular rate (fig. 2A). Subsequently, the addition of flecainide resulted in effective slowing of the ventricular rate to 80–85 bpm followed by conversion to sinus rhythm (fig. 2B). The therapy was increased gradually and in consultation with the obstetrics/gynaecology team of our institution for the regular monitoring of the vital parameters of the foetus.

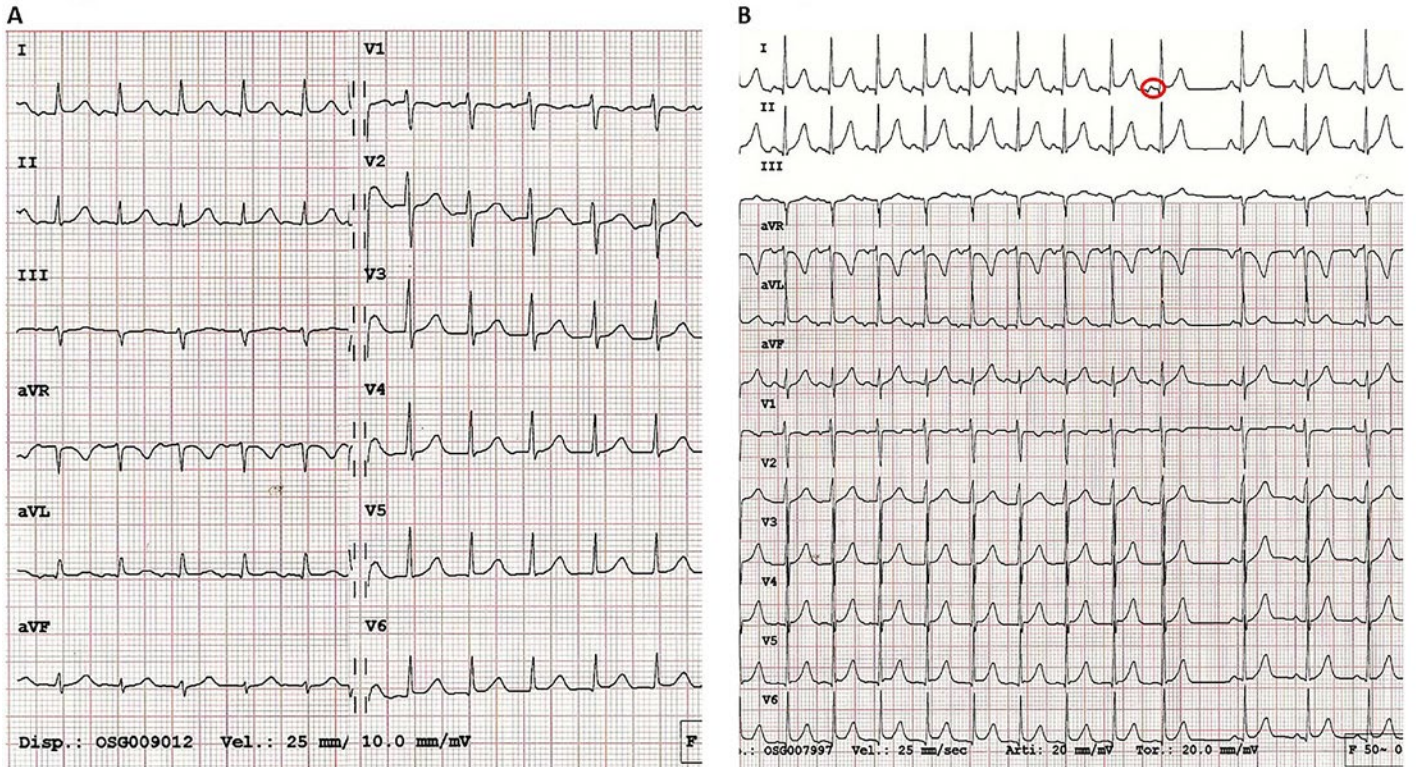
After 37 weeks of gestation, a healthy infant was delivered through a Caesarean section. After delivery, the palpitations had ceased and stable sinus rhythm was documented at the out-patient clinic three weeks after delivery. Metoprolol and flecainide were stopped.

Until the patient's second pregnancy at 12 weeks, there were no recurrences. At 15 weeks in the second pregnancy, the same therapy was prescribed (table 1). Compared with the first pregnancy lower dosages of metoprolol (75 mg) and flecainide (50 mg twice daily) were required to achieve clinically effective rhythm control. As before, after the delivery of a second healthy infant, the episodes ceased.

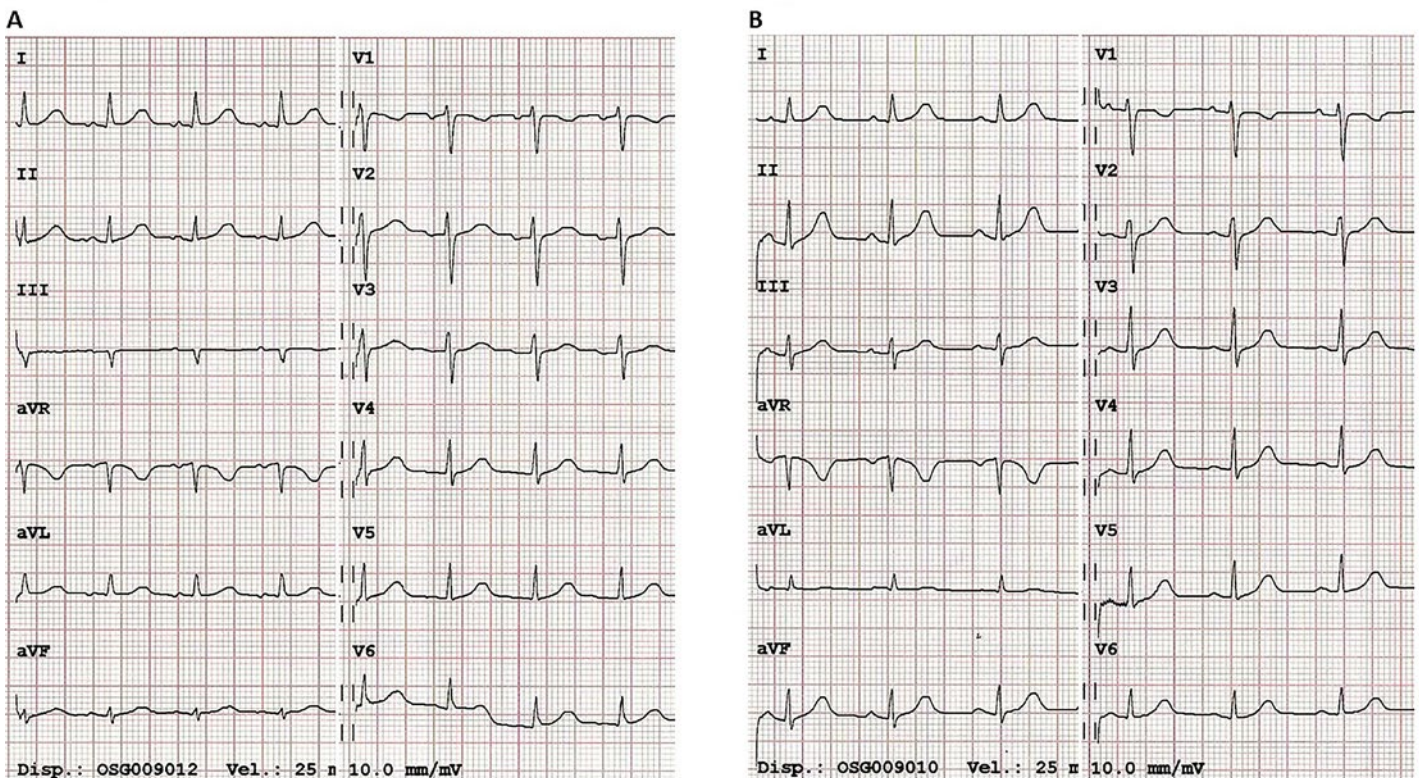
## Discussion

We describe the case of a pregnancy-related adenosine-sensitive recurrent persistent atrial





**Figure 1:** Narrow complex tachycardia at 136 bpm (440 msec cycle length) (A) RP interval (300 msec) > PR interval (140 msec) and the atrial wave shows an inferior-right axis. After administering adenosine 6 mg intravenously (B), recovery to sinus rhythm was observed, with termination of the arrhythmia occurring with a ventricular event.



**Figure 2:** With metoprolol 100 mg (A), the rate was effectively controlled. The addition of flecainide 100 mg bid (B) allowed restoration and maintenance of sinus rhythm.



**Table 1: Metoprolol and flecainide dosages during the two pregnancies**

	Metoprolol initiation	Metoprolol maximum dose reached	+ Flecainide
1st Pregnancy	Week 29	Week 29 (100 mg)	Week 30 (100 mg bid)
2nd Pregnancy	Week 15	Week 15 (75 mg)	Week 24 (50 mg bid)

tachycardia. During both pregnancies, combination of metoprolol and flecainide effectively controlled symptoms, without adverse effects on the foetus. In the second pregnancy, initiating therapy earlier allowed more effective control of the symptoms with lower dosages of both anti-arrhythmic drugs.

During pregnancy, the cardiovascular system undergoes physiological adaptations. Haemodynamic, hormonal and autonomic changes can be arrhythmogenic [1, 2]. Cardiac output increases 30–50%, especially in the first weeks of pregnancy, resulting in a 35% increase in stroke volume and a 15% increase in heart rate. Plasma volume increase causes stretching of atrial and ventricular cardiomyocytes, resulting in potential cellular electrophysiological alterations, such as early after depolarisations, shortened refractoriness, slowed conduction and increased electrical spatial dispersion (3). A higher heart rate at rest is a known arrhythmogenic factor [4]. Furthermore, oestradiol and progesterone have proarrhythmic properties [5]. Although the presence of underlying structural heart disease is a risk factor for supraventricular tachycardia, in most cases there is no history or evidence of cardiac illness.

Cardiac arrhythmias represent one of the most common cardiovascular disorders that may complicate a pregnancy (prevalence 0.1–2%), AVNRT being by far the most frequent supraventricular tachycardia [1]. Conversely, atrial tachycardias are rare. In one reported case, successful management of persistent atrial tachycardia with high ventricular rate was obtained by introducing amiodarone 400 mg daily, after a loading dose of 800 mg for 1 week [6]. Another case report described recurring paroxysmal atrial tachycardia in three pregnancies effectively and safely treated with multiple cardioversions [7].

In the present case, an intravenous adenosine bolus was utilised, resulting only in a transient effect. Progressively increasing doses of metoprolol were needed to effect the ventricular rate. Full-dose flecainide was subsequently combined with metoprolol yielding a lasting clinical effect until the end of the pregnancy. Current evidence supports the prophylactic

use of metoprolol with a high level of evidence as well as the use of flecainide [2].

The case presented here provides further evidence that the combination of metoprolol and flecainide, may be effective to treat pregnancy-related persistent atrial tachycardia. In the case of drug-refractory, symptomatic atrial tachycardia, radiofrequency ablation should be considered [5].

## Take home messages

- Incessant pregnancy-related atrial tachycardia rarely occurs during pregnancy. Therefore, the description of such cases is important for patient management.
- In the present case, the atrial tachycardia responded to intravenous adenosine but recurred immediately.
- A stepwise pharmacological approach was adopted, starting with progressively increasing dosages of metoprolol (up to 100 mg/day), which resulted in effective control of the ventricular rate, followed by the addition of flecainide (50 mg twice daily), which achieved rhythm control.
- During the second pregnancy earlier initiation of the same therapy was effective, utilising lower dosages of metoprolol and flecainide.

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## Disclosure statement

No financial support and no other potential conflict of interest relevant to this article was reported.

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