

Regadenoson long-lasting use induced tachyarrhythmia

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INTRODUCTION

Regadenoson is used as a vasodilator agent in stress testing. It is chosen in preference over other vasodilator agents because of its ease of use, short duration of action, safety profile, and efficacy.¹ In this paper, we report a case of a supraventricular tachycardia after the use of regadenoson.

CASE SUMMARY

A 75-year-old woman with a long-standing history of well-controlled hypertension, dyslipidemia, complex partial temporal epilepsy of unknown etiology, rheumatoid arthritis, and recent thyroidectomy because of multinodular goiter underwent stress testing because of chest pains.



Figure 1. Basal ECG which shows sinus rhythm with only an isodiphasic t wave in V4-V6.

The patient underwent a combined exercise and regadenoson myocardial perfusion imaging (MPI; treadmill 2 mph, 0%). Her baseline ECG showed sinus tachycardia with a heart rate (HR) of 108 bpm (Figure 1). She was hypertensive with blood pressure (BP) of 185/130 mmHg. At the end of the exercise, she reached a HR of 135 bpm and a BP of 212/130 mmHg.

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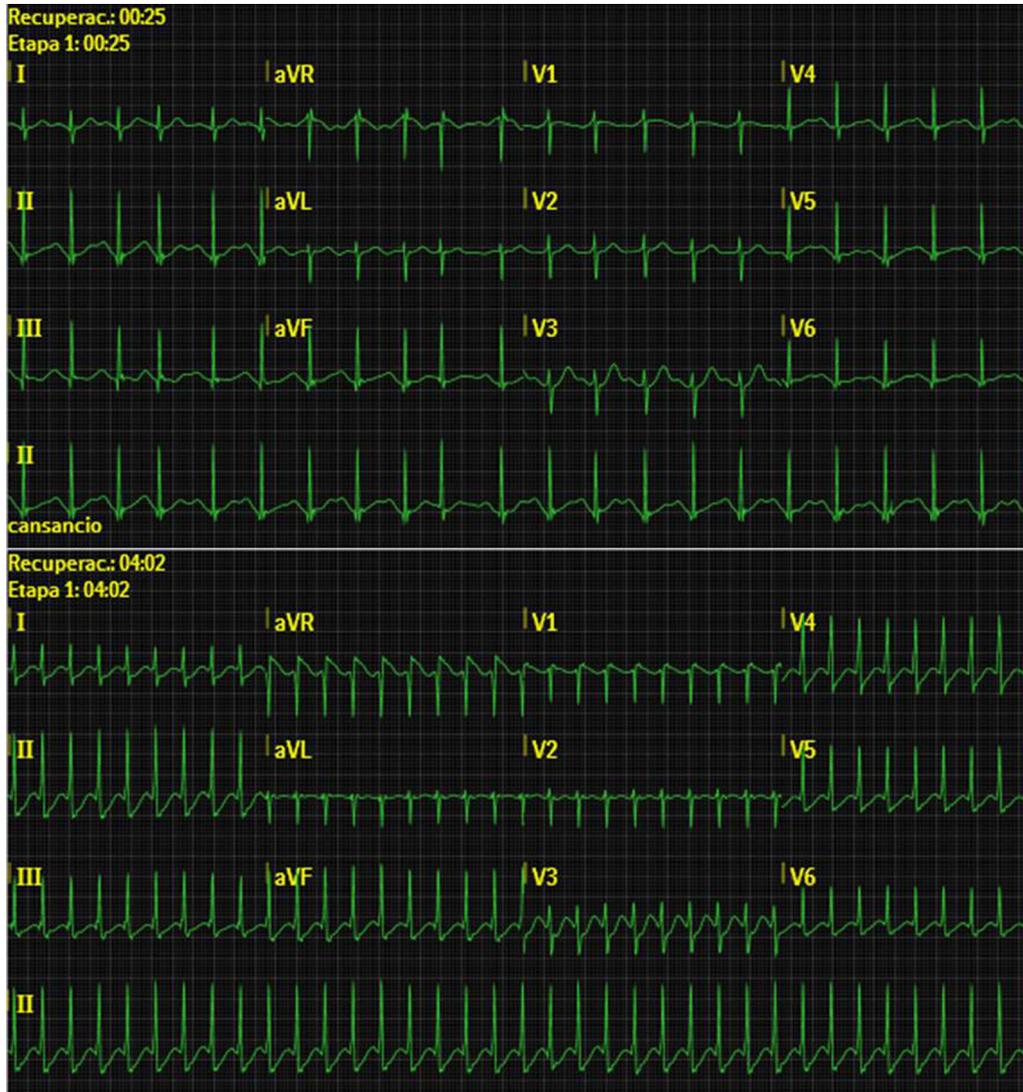


Figure 2. Recovery ECG where the supraventricular tachyarrhythmia began at minute. 3 The rhythm quickly then progressed to third-degree heart block for approximately 14 seconds with a ventricular rate of 20 beats per minute.

In the recovery phase, she began to feel dizziness, tiredness, and dyspnea, but no chest pain, and in the third minute, she developed a supraventricular tachycardia at a rate of 226 bpm catalogued as intranodal (Figure 2).

Aminophylline, carotid massage, and adenosine were not effective. BP was lowered to 128/98 mmHg but intranodal tachycardia persisted for over 40 minutes (Figure 3), and the patient was taken to Emergency Department where 25 mg of atenolol and 0.25 mg of alprazolam were administered by mouth, and tachycardia was reversed (Figure 4). The perfusion scan was not acquired.

The patient confirmed that 4 days before MPI, the endocrinologist reduced the dose of levothyroxine from 125 to 75 mcg, as she was overtreated, and she recalled prior tachycardia episodes long time ago.

DISCUSSION

Supraventricular tachyarrhythmias are known to occur even though they are rare and are registered in the Food and Drug Administration database documents.² This is the first case, to our knowledge, of such a long-lasting supraventricular tachyarrhythmia case. It has been suggested that regadenoson may have caused direct

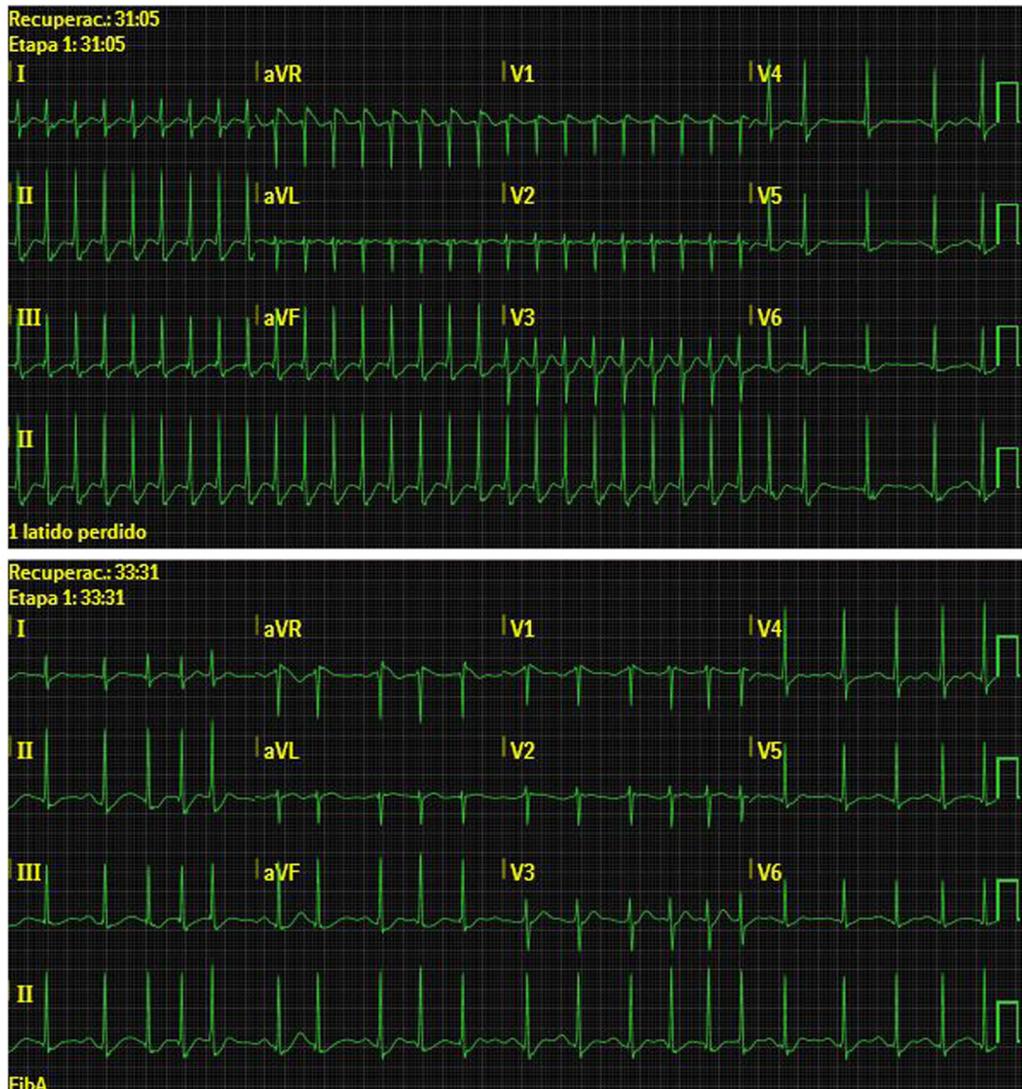


Figure 3. Persistent tachyarrhythmia.

stimulation of the sympathetic nervous system via activation of A_{2A} adenosine receptor, which will induce tachycardia.³ It is also suggested that the excess of thyroid hormones is related with an increase of the inotropic cardiac activity due to an increase in the number of β -adrenergic receptors.⁴

In this case, the fact that the patient had been overtreated with levothyroxine, together with her personal history of prior episodes of tachyarrhythmia, could have facilitated the triggering of supraventricular tachyarrhythmia upon regadenoson administration. Also,

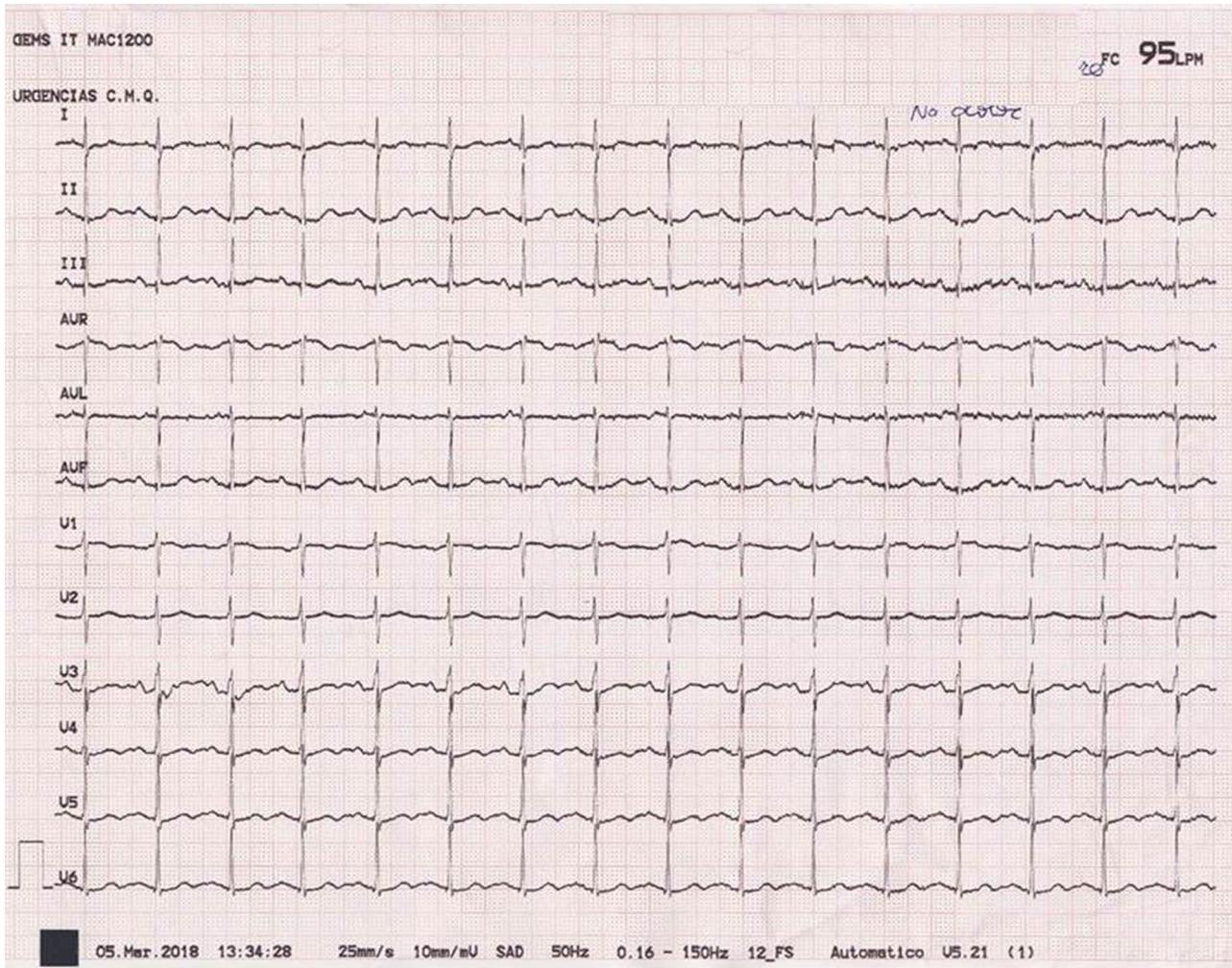


Figure 4. Normal sinus rhythm after a tablet of 25 mg of atenolol with tachyarrhythmia being resolved within 30 seconds.

in cases like this, the effective role of aminophylline is uncertain, and it was not effective in this patient.

Disclosures

C. Ramos-Font, A. Jimenez-Heffernan, A. Gonzalez, M. Rashki and J. M. Llamas-Elvira work for the public health system and they have nothing to disclose. They have no funding resources nor conflict of interest in this publication.

References

1. Salgado-García C, Jiménez-Heffernan A, Ramos-Font C, Lopez-Martin J, Sánchez-de-Mora E, Aroui T, et al. Safety of regadenoson

in patients with severe chronic obstructive pulmonary disease. *Rev Esp Med Nucl Imagen Mol* 2016;35:283-6.

2. LEXISCAN (regadenoson) injection for intravenous use. highlights of prescribing information. FDA Reference ID 4041701. https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/022161s013b1.pdf.

3. Dhalla AK, Wong MY, Wang WQ, Biaggioni I, Belardinelli L. Tachycardia caused by A2A adenosine receptor agonists is mediated by direct sympathoexcitation in awake rats. *J Pharmacol Exp Ther* 2006;316:695-702.

4. Ertek S, Cicero AF. Hyperthyroidism and cardiovascular complications: A narrative review on the basis of pathophysiology. *Arch Med Sci* 2013;9:944-52.