

# Acta Cardiologica

## Paradoxical nonreentrant Tachycardia induced by iatrogenic atrioventricular Block --Manuscript Draft--

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<b>Response to Reviewers:</b>	<p>Dear Editor,</p> <p>We have read with great interest the comments of the reviewer; We incorporated all the suggestions.</p> <p>More specifically: answer to : "Comments to the Author"</p> <p>Reviewer #1: - amiodarone was effective : intravenous ? oral with administration by feeding tube ? We added the word 'intravenously administered' - The 5 references are previous case reports and should be replaced by "dual AVN nonreentrant tachycardia, Peiker et al, Europace 2016" which reviews the literature and the current state of knowledge of that rare arrhythmia. We changed the references to the suggested review article.</p> <p>Reviewer #2: No specific comment No references in the Image Focus format. We leave the decision to in- or exclude the references to the editor.</p> <p>We greatly appreciate the opportunity to publish this article.</p> <p>Sincerely yours,</p> <p>On behalf of all authors:</p>

	Mieke Roggen, Christophe Garweg, Rik Willems, Marc Gewillig, Joris Ector.
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## **Paradoxical nonreentrant Tachycardia induced by iatrogenic atrioventricular Block**

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## 1 **Image Focus**

2 A 5 week old male infant with complex congenital heart disease underwent cardiac  
3 catheterization and balloon dilatation of a banded pulmonic artery. He was born with a  
4 univentricular heart: double inlet left ventricle with L-loop. He had undergone a surgical  
5 correction for aortic coarctation and pulmonic artery banding in the first week of life.

6 The electrocardiogram before the catheterization procedure showed a normal PR interval.  
7 During the procedure, transient mechanical total atrioventricular (AV) block occurred due to  
8 contact between the intracardiac balloon and the AV conduction system. At the end of the  
9 procedure, AV conduction improved to a pronounced atrioventricular delay with a PR interval  
10 of 390 ms, and the patient was admitted to the intensive care unit to monitor AV conduction.  
11 In the subsequent hours, he developed paroxysms of narrow-QRS tachycardia at a rate of 230  
12 bpm showing 'one to two' conduction over the AV node, with each P wave followed by two  
13 QRS complexes with alternating R-R interval (figure). He was treated with a low dose of  
14 intravenous metoprolol without clear effect on the tachycardia episodes; intravenously  
15 administered amiodarone with cooling resulted in acceptable rate control. After one day, the  
16 PR interval decreased again to 140 ms and the episodes of tachycardia disappeared, without  
17 recurrence during follow-up.

18 'One to two' tachycardias over the AV-node are well known and caused by dual fast and slow  
19 AV nodal pathway conduction.<sup>1</sup> Our case however is the first report describing a 'one to two'  
20 tachycardia caused by iatrogenic slowing of the AV nodal conduction due to mechanical  
21 block. The most probable explanation for our findings is transient block of the fast antegrade  
22 AV-nodal pathway, and concurrent slowing of the antegrade slow pathway resulting in  
23 pronounced first-degree atrioventricular block. When antegrade fast pathway conduction  
24 recovers, 'one to two' conduction over the fast and slow pathway results in tachycardia. When  
25 also slow pathway conduction improves later on, 'one to two' conduction is no longer

26 possible because of the refractoriness of the His-Purkinje system after the previous impulse  
27 over the fast AV nodal pathway, resulting in disappearance of the tachycardia episodes.

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### 30 **Disclosure of interest**

31 The authors report no conflicts of interest.

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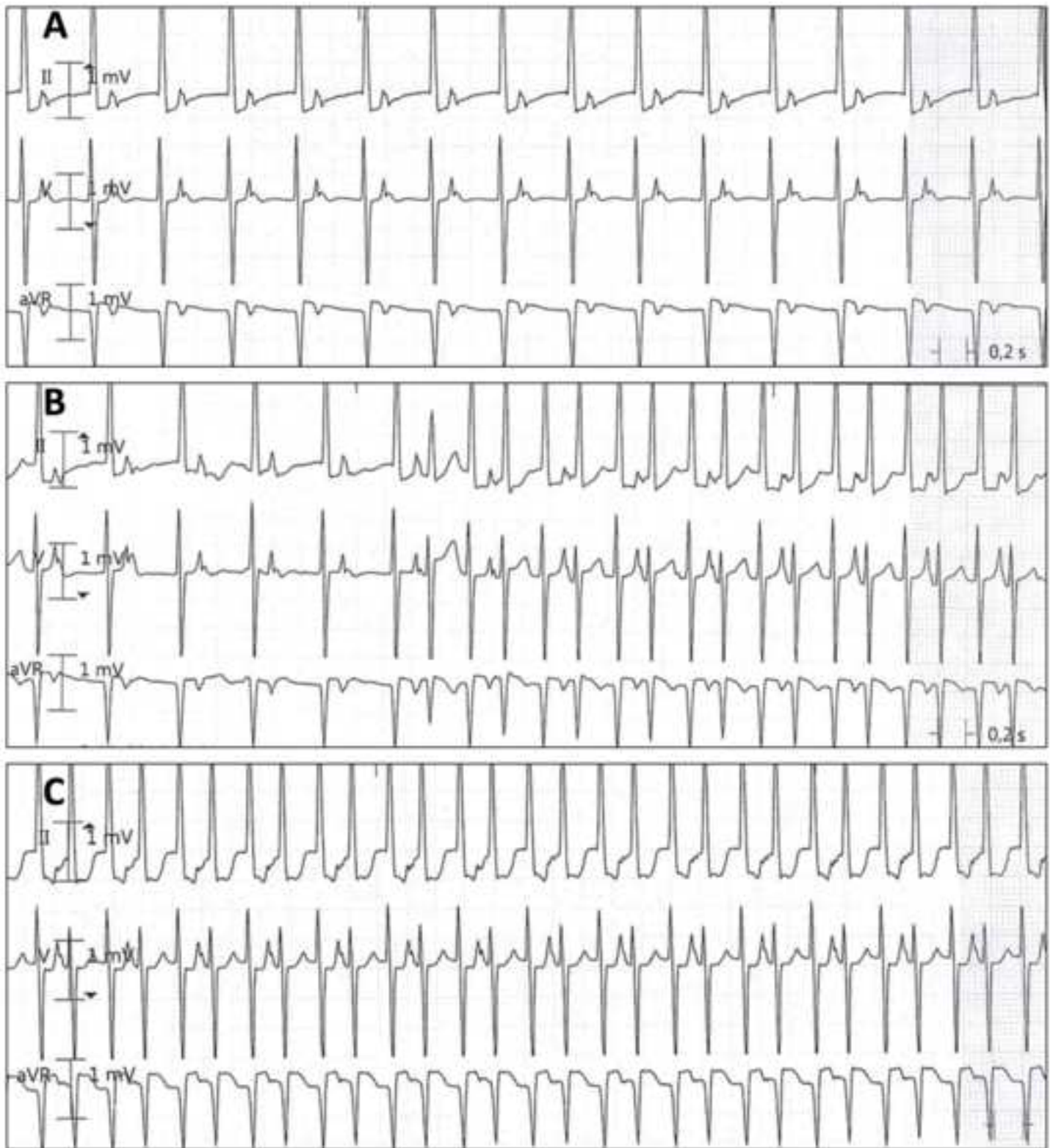
### 33 **References**

- 34 1. Peiker C, Pott C, Eckardt L, Kelm M, Shin DI, Willems S, Meyer C. Dual  
35 atrioventricular nodal non-re-entrant tachycardia. *Europace* 2016; 18(3):322-9.

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## 1 **Figure Legend**

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3 Electrocardiographic monitoring of leads II, V1 and aVR .

4 A: Pronounced PR prolongation after the balloon dilatation procedure. There is a one to one P/R relationship  
5 with a PR interval of 390 ms

6 B: Initiation of a one to two tachycardia over the AV-node, showing a one to two P/R relationship with marked  
7 QRS-alternans and alternating R-R interval.

8 C: Continuation of the one to two tachycardia in subsequent hours, until improvement in AV nodal conduction  
9 makes one to two conduction impossible and normal one to one AV-conduction is restored.

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### Conflicts of Interests

The author report no conflicts of interest



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