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Review

Syncope and paroxysmal atrioventricular block

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ABSTRACT

Current literature reveals three types of paroxysmal atrioventricular block (AVB) that can cause syncope:

Intrinsic paroxysmal atrioventricular block is due to an intrinsic disease of the AV conduction system; this type of “cardiac syncope” is also called Stokes-Adams attack;*Extrinsic vagal paroxysmal atrioventricular block* is linked to the effect of the parasympathetic nervous system on cardiac conduction and is one of the mechanisms involved in “reflex syncope.”*Extrinsic idiopathic paroxysmal atrioventricular block* is associated with low levels of endogenous adenosine and is supposed to be one of the mechanisms involved in “low-adenosine syncope.”

These three types of paroxysmal AVB present different clinical and electrocardiographic features. Additionally, the efficacy of cardiac pacing and theophylline therapy to prevent syncopal recurrences is also different for these three types of AVB.

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1. Introduction

Syncope due to paroxysmal atrioventricular block (AVB) occurs because of a sudden change from apparently physiological atrioventricular conduction to transient second- or third-degree heart block, which leads to ventricular asystole.

Syncope is the main accompanying symptom in approximately 40% patients affected by recent-onset persistent AVB [1–3]. However, the prevalence of syncope due to paroxysmal AVB is probably under-reported [4]. In recent years, newly available long-term ECG monitoring devices have increased the diagnostic yield [5,6].

2. Types of paroxysmal AV block

Three types of paroxysmal AVB are currently described in literature:

- *Intrinsic paroxysmal atrioventricular block (I-AVB)* is due to an intrinsic disease of the AV conduction system; this type of “cardiac syncope,” is also called Stokes-Adams attack.
- *Extrinsic vagal paroxysmal atrioventricular block (EV-AVB)* is linked to parasympathetic influence on cardiac conduction and is one of the mechanisms involved in “reflex syncope.”
- *Extrinsic idiopathic paroxysmal atrioventricular block (EI-AVB)* is associated with low values of endogenous adenosine and is supposed to be one of the mechanisms involved in “low adenosine syncope.”

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The management (diagnosis and therapy) of patients with syncope suspected of being due to paroxysmal AVB depends on the type of block.

The distinguishing features of the three forms of paroxysmal AVB are summarized in Table 1 and Fig. 1.

I-AVB is a manifestation of an intrinsic disease of the atrioventricular conduction system. It usually occurs in patients older than 60 years and is associated with bundle branch block (BBB) and/or an underlying heart disease [4,7]. A short history of syncope is usually reported, the onset of syncopal episodes typically

Table 1
Comparison of the 3 forms of paroxysmal AVB.

Features	Intrinsic AV block (I-AVB) <i>Cardiac syncope</i>	Extrinsic vagal AV block (EV-AVB) <i>Reflex syncope</i>	Extrinsic idiopathic AV block (EI-AVB) <i>adenosine syncope</i>
ECG			
Sinus rhythm	BBB frequent	BBB infrequent	Narrow QRS
Before AVB	– Sometimes AVB initiated by APB or VPB	– Progressive sinus rate slowing (P-P cycle increase)	– Sinus rate unchanged (P-P cycle unchanged)
	– PR unchanged	– Generally progressive PR prolongation	– PR unchanged
During asystolic AVB	Sinus rate increase (P-P cycle decrease)	Sinus rate slowing (P-P cycle increase)	Sinus rate unchanged (P-P cycle unchanged)
End of AVB	– Sometimes AVB interrupted by APB or VPB	Sinus rate acceleration (P-P cycle decrease)	Sinus rate unchanged (P-P cycle unchanged)
Follow-up	Progression to persistent AVB	No progression to persistent AVB	No progression to persistent AVB
Syncope			
History of syncope	Short (mostly < 1 year)	Long (since youth)	Short (average 2 years)
Prodromes	No or very short (≤ 5 s) prodromes	Always present > 10 s	No or very short (≤ 5 s) prodromes
Structural heart disease	Mostly present	Mostly absent	Absent
Age on presentation	Elderly	Any age	Any age, mostly over 40 years
Efficacy of pacemaker therapy	Effective	Partially effective	Effective
Efficacy of theophylline therapy	Ineffective	Partially effective	Effective
Investigations			
Plasma adenosine value	Normal	High	Low or very low
Adenosine (ATP) test	Usually negative	May be positive	Frequently positive (asystolic 3rd degree block)
Tilt table test	Usually negative	Mostly positive	Mostly negative
Electrophysiological study	Frequently positive	Negative	Negative
Carotid sinus massage	Usually negative	Frequently positive	Negative

Abbreviations: AVB=atrioventricular block; ECG=electrocardiography; BBB=bundle branch block; APB=atrial premature beat; VPB=ventricular premature beat

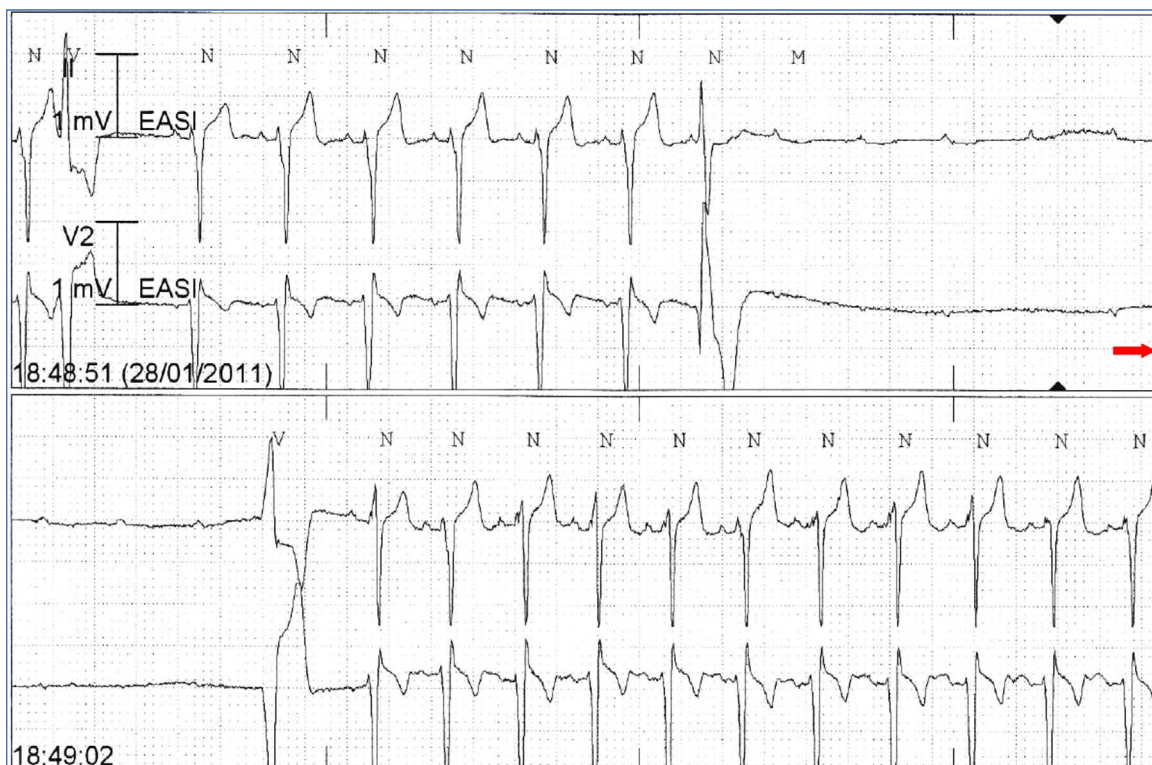


Fig. 1. Continuous tracing shows an episode of intrinsic AVB (I-AVB) due to His-Purkinje conduction disease. AVB starts suddenly and ends with a ventricular premature beat; P-P cycle length remains constant throughout the recording. AVB=atrioventricular block.

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