e-ISSN 2795-3276
p-ISSN 2795-3270

GPH INTERNATIONAL JOURNAL
Research in
Biological Science
www.gphjournal.org || editor@gphjournal.org

10.5281/zenodo.10000027 Vol. 06 Issue 09 Sept - 2023 Manuscript ID: #1044

A rare association of complete atrio-ventricular block and preexcitation: case report

Myriam Lahraoui, Safae Hilal, Fadoum Hassan, Ibtissam Fellat, Mohamed Cherti

Corresponding author: lahraouimyriam@gmail.com

ABSTRACT

Complete atrioventricular block (AVB) associated with an accessory pathway is a rare phenomenon. We report a case of high degree AVB on Wolff Parkinson White (WPW) syndrome associated with an accessory pathway in a 60-year-old female patient. The electrocardiogram (ECG) on admission showed a regular sinus rhythm with a short PR interval and a QRS notch with a transition to conductive disturbances, specificallya complete AVB and a transition to a 2/1 AVB. The patient underwent endocavitary exploration, which revealed a pre-excitation in the right anteroseptal position with a long refractory period, justifying its non-ablation. She then underwent implantation of a double-chamber pacemaker with simple follow-up and regular monitoring in the rythmology clinic. This case report describes this rare association and highlights the conduction duality of the normal nodo-hissian pathway and the accessory pathway.

KEYWORDS:

Complete atrioventricular block, WolffParkinsonWhite, Pre-excitation syndrome

Introduction

Atrioventricular block is a group of permanent or paroxysmal conduction disorders that affect the atrioventricular junction (atrioventricular node, His-Purkinje system) [1].

Wolff-Parkinson-White is a ventricular pre-excitation syndrome defined by the association of a short PR interval, an initial QRS notch (known as the delta wave) and paroxysmal tachycardia attacks [2].

The spontaneous association of AVB and pre-excitation is rare, as shown by the small number of cases in the literature [3,4]. This assumes that atrial depolarization is more or less permanently blocked, both through normal conduction tissue and the accessory pathway. We report this infrequent association to discuss the difficulties of its management.

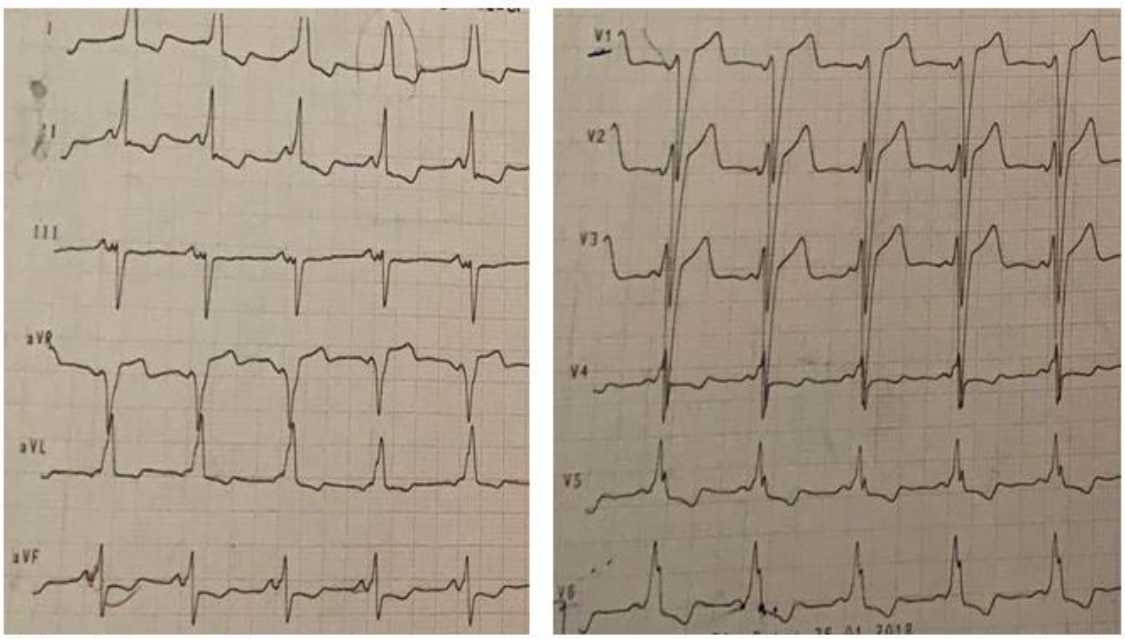
Case report:

We report the case of a 60-year-old female patient, admitted for management of exertional lipothymia. She has no modifiable cardiovascular risk factors or particular antecedents.

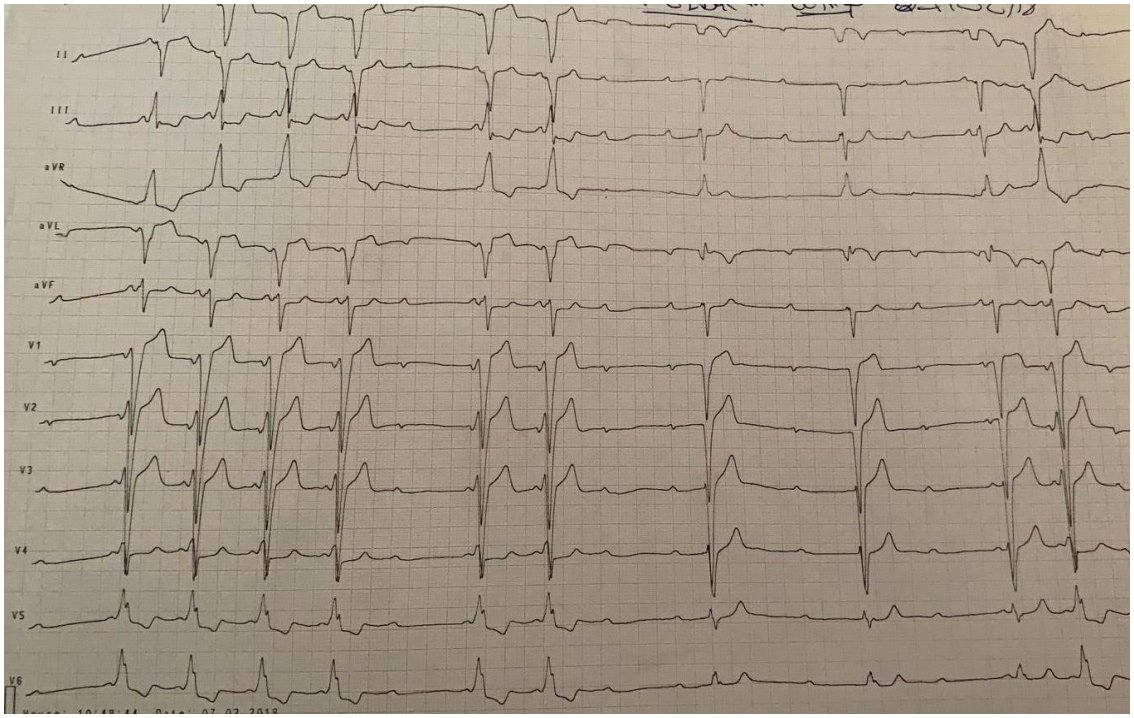
The onset of symptoms was 1 year ago, with incomplete loss of consciousness on exertion, lasting 2 to 3 minutes and not preceded by prodromal symptoms or associated with convulsion or postcritical coma.

The evolution was marked by lipothymia occurring more and more frequently over the last 3 months, at the rate of once a day, which prompted the patient to consult a private cardiologist who referred her to the emergency department and then to our training center for further treatment.

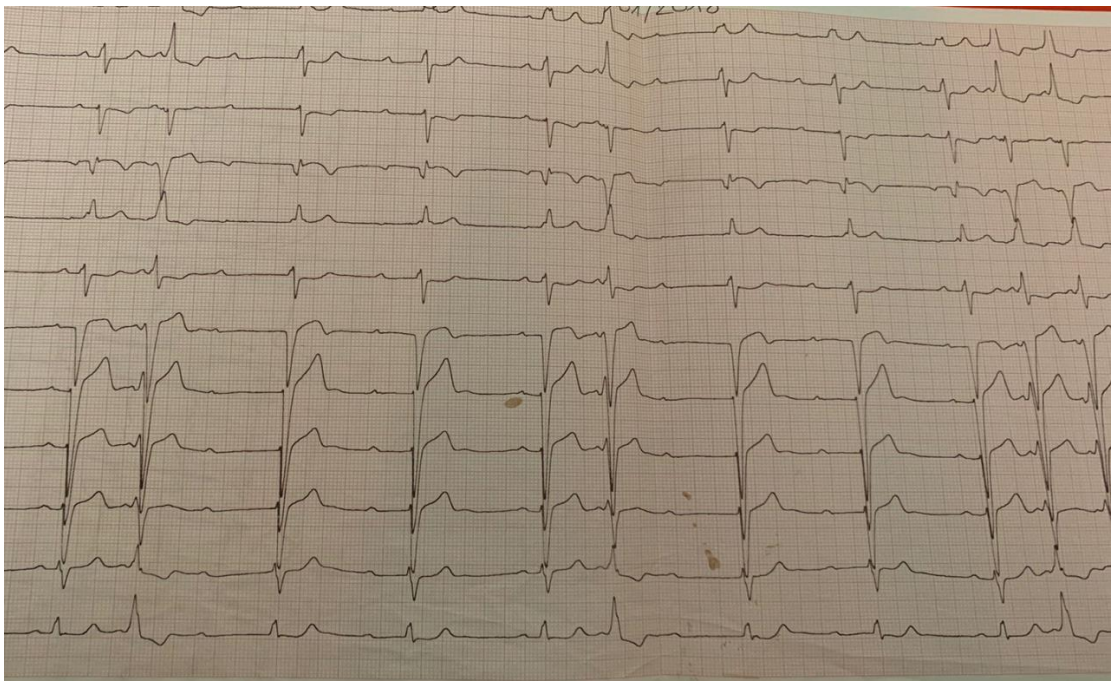
Clinical examination shows a conscious patient, eupneic at rest, with an arterial pression at 136/82 mmHg, a heart rate at 65 bpm. Heart sounds well-perceived with regular rhythm with no murmurs or additional sounds. No signs of right heart failure. Present and symmetric peripheral pulses. The pulmonary and the general examinations were also normal.



12-lead electrocardiogram showing a regular sinus rhythm with a short PR space, a slow rise of initial portion of the QRS (delta wave) and an aspect of left bundle branch block (LBBB).



12-lead electrocardiogram showing regular sinus rhythm with an episode of AVB 2/1 and a LBBB appearance with secondary repolarization disorders.



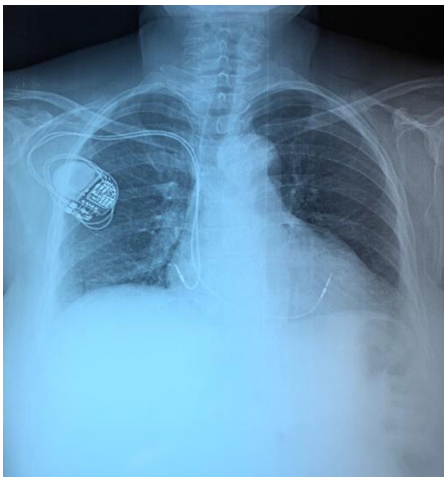
12-lead electrocardiogram showing complete atrioventricular dissociation with 3rd-degree AVB on ventricular escape with narrow QRS complexes at 45 cycles per minute. The presence of a few pre-excitation complexes (short PR with QRS notch) is noted.

The patient remained asymptomatic throughout these electrical changes.

Echocardiography and laboratory tests were unremarkable.

The patient underwent endocavitary exploration, which revealed the presence of right anteroseptal pre-excitation with a hissian atrium first during retrograde conduction. The WPW refractory period was 360 ms. The HV was impossible to measure because His is confused with the pre-excitation potential stuck to the ventricle during highly permeable retrograde conduction, conducted intermittently.

The patient underwent cephalic implantation of a double-chamber pacemaker with simple follow-up and regular consultation in the rythmology unit.



Chest X-ray after implantation of a double-chamber pacemaker

Discussion:

The association of an AVB and spontaneous WPW is rare [3,4].Few studies have examined the relationship between the atrioventricular conduction properties of the atrioventricular node (AVN) and the anterograde conduction capacity of the accessory pathway in Wolff Parkinson White syndrome [5].

The electrical manifestation of pre-excitation in sinus rhythm depends on the relative conduction times of the atrioventricular node and the accessory pathway [5]. Indeed, it has been demonstrated that faster conduction via the accessory pathway is necessary for the onset of pre-excitation [5].In fact, cases of accessory pathway unmasking have been described during persistent or intermittent complete block of atrioventricular conduction [6, 7, 8].
On the other hand, the presence of an accessory pathway with an appearance of ventricular pre-excitation may in some cases mask a possible transition to atrioventricular block. In these patients, atrioventricular conduction occurs solely, and entirely, via the accessory pathway. Underlying complete nodal or infra-helical block will only be visible on ECG if there is concomitant block of atrioventricular conduction through the accessory pathway [9].

Sometimes the accessory pathway only manifests itself in the event of an AVB, as its refractory period is longer than that of the AV node. When AVB occurs, the accessory pathway is visible, whereas when the rhythm is more accelerated, the accessory pathway is no longer visible on the ECG [3,4,10].

And sometimes, since the accessory pathway is refractory period dependent compared to the normal nodo-hissian conduction pathway, when the heart rate is slow, it may conduct alternately, which means that the accessory pathway has a very slow refractory period. When it's accelerated, or stimulated, for a AVN that's used to work slowly, this rapidity of the frequency may flood the nodo-hissian pathway, enabling conduction through the accessory pathway.

The appearance of atrio-ventricular conductive disorders after radiofrequency ablation of an accessory pathway, located at a distance from the atrio-ventricular junction, is not considered by some authors to be a genuine complication of this procedure. Rather, it may be a prior conductive disorder that has been unmasked by the blockage of the accessory pathway during ablation [9, 11].
It therefore makes sense to review the indication for ablation of the accessory pathway in such cases, especially in asymptomatic patients who have never reported a history of palpitation attacks [9]. Only the study of anterograde refractory periods can determine the correct indication for ablative treatment [6]. In our case, the accessory pathway is not capable of rapidly conducting electrical impulses from the atria to the ventricles. It is not considered dangerous, as its anterograde refractory period is greater than 250 ms, which was 360 ms after realizing the endocavitary exploration to our patient.

The indication for pacemaker implantation remains valid, given the risk of progressive and subsequent degeneration of the accessory pathway [5]. In addition, conduction via the accessory pathway, whether continuous or intermittent, would help prolong pacemaker longevity by inhibiting ventricular pacing in the event of atrio-ventricular conduction through the accessory pathway [9].

Conclusion:

Spontaneous association of AVB and WPW, although rare, is possible. Its discovery in our case highlights the importance of monitoring patients hospitalized for rhythm or conduction disorders, and the important role of knowledge of the electrophysiological mechanism in therapeutic decisions.

References:

1- A. Moustaghfir et al. Les troubles de la conduction du mécanisme au traitement. Septembre 2005: 49-78.

2- A. Moustaghfir et al. Les arythmies supraventriculaires. Septembre 2012:147-176.

3- Takagi Y, Watanabe I, Masaki R, Okumura Y, Yamada T, Wakita R et al. Complete AV block developing in a patient with manifest ventricular preexcitation. Int Heart J 2005; 46:729-35.

4-V.Palanca et al. Intermittent Atrioventricular Block in an Accessory Pathway associated With Complete Infra-Hissian Block. Rev Esp Cardiol 2004;57(4):363-6

5. Liu S, Olsson S.B, Hertervig E, Kongstad O, Yuan S. Atrioventricular conduction: a determinant for the manifestation of ventricular preexcitation in patients with Wolff Parkinson White syndrome. Clinical Physiology 2001; 21:534-540.

6. Chaib A, Bouzelmat H, Boulaamayel S, Kheyi J, Moustaghfir A. Une pré-excitation en bloc. Presse Med 2014; 43:480-482.

7. Erdogan O. A rare coexistence of complete atrioventricular block and preexcitation in an elderly symptomatic patient. JCardiovasc Med 2008;9(7):729-732.

8. Erickson C, Yetman A T, Jones C S, Duncan W T. Late Onset of Accessory Pathway Conduction in a Patient with Complete AV Block. Pacing and Clinical Electrophysiology 2000;23(2):280-282.

9. Dinckal M H, Davutoglu V, Bayata S. Masked Complete Atrioventricular Block in a Patient with Ventricular Preexcitation. J Interv Card Electrophysiol 2004;11:33-35.

10- F. Boustani . L’essentiel en cardiologie, consensus cardio pour le praticien - N° 76 • Février 2012: 161-168.

11. Singh B, Sudan D, Kaul U. Transient complete atrioventricular block following radiofrequency ablation of left free wall accessory pathway. J Inter Card Electrophysiol 1998;2:305- 307.