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Wolff-Parkinson-White Syndrome management in a pregnant woman

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Abstract: *Wolff-Parkinson-White syndrome (WPWS) is a rare condition affecting between 0.1% and 0.3% of the general population. It is characterized by the existence of one or more accessory nodal pathways that provide anatomical support for ventricular pre-excitation. Symptomatic patients may experience symptoms such as palpitations, and have an esteemed risk of sudden death of 0.25% per year or 3% to 4% over a lifetime. Findings on ECG are characteristic including a short PR interval and prolonged QRS with a delta wave in the presence of sinus rhythm. In this paper, we report a case of WPWS in a pregnant woman with brief literature review. Though this work, we aim to draw attention on pregnancy as an event that tends to uncover asymptomatic pre-excitation to tachyarrhythmias, and that complicates therapeutical management of this condition since the majority antiarrhythmics should be regarded as potentially toxic to the foetus. Indeed, it is recommended to convert supra-ventricular tachycardia trying, first, vagal manoeuvres. As a second-line option, certain drugs can be safely used in pregnant patients with the Adenosine being the drug of choice. Regarding the anaesthetic management of WPWS a pregnant patient posted for caesarean section, regional anaesthesia is preferred over general anaesthesia, and epidural anaesthesia is preferred to the spinal.*

Keywords: *Wolff-Parkinson-White syndrome, ventricular pre-excitation, supraventricular tachycardia, palpitations, sudden death, vagal manoeuvres, adenosine, epidural anaesthesia.*

Introduction

Wolff-Parkinson-White syndrome (WPWS) was first described in 1930 [1]. It is a rare condition, that affects between 0.1% and 0.3% of the general population [2], characterized by the existence of one or more accessory nodal pathways that provide anatomical support for ventricular pre-excitation and supraventricular tachycardia (SVT). While some patients remain asymptomatic, others may present symptoms such as palpitations with a risk of sudden death [1]. In this paper, we report a case of WPWS in a pregnant woman with brief literature review.

Case presentation

We report the case of Mrs F.S, a 35-year-old patient, gravida 2 para 2. The first pregnancy was not followed up, carried to term, with vaginal delivery in a peripheral hospital. The delivery was unmonitored thus proceeded without incident, and the postpartum period was marked by the occurrence of deep vein thrombosis, which was treated with anticoagulant therapy. The second pregnancy was also not followed up, however, the onset of an episode of palpitations prompted the patient to consult. The electrocardiogram (ECG) demonstrated a brief PR interval accompanied by a characteristic notch in the R wave (delta wave), which is consistent with WPWS. Additionally, the ECG showed an appearance of left bundle branch block (Fig. 1). On the obstetrical side, the pregnancy was at term, and the examination revealed a reduced uterine height compared with the gestational age, no uterine contractions, a normal foetal heart rate, and on ultrasound, a foetus in the transverse position. The patient was then considered for a caesarean section for transverse foetal presentation. The C section was performed under combined spinal epidural anaesthesia due to its reliable and profound block, prolonged duration, hemodynamic stability, and post-operative pain management. During the operation, the patient experienced two episodes of SVT which were controlled by vagal manoeuvres. Post-operative follow-up was unremarkable.

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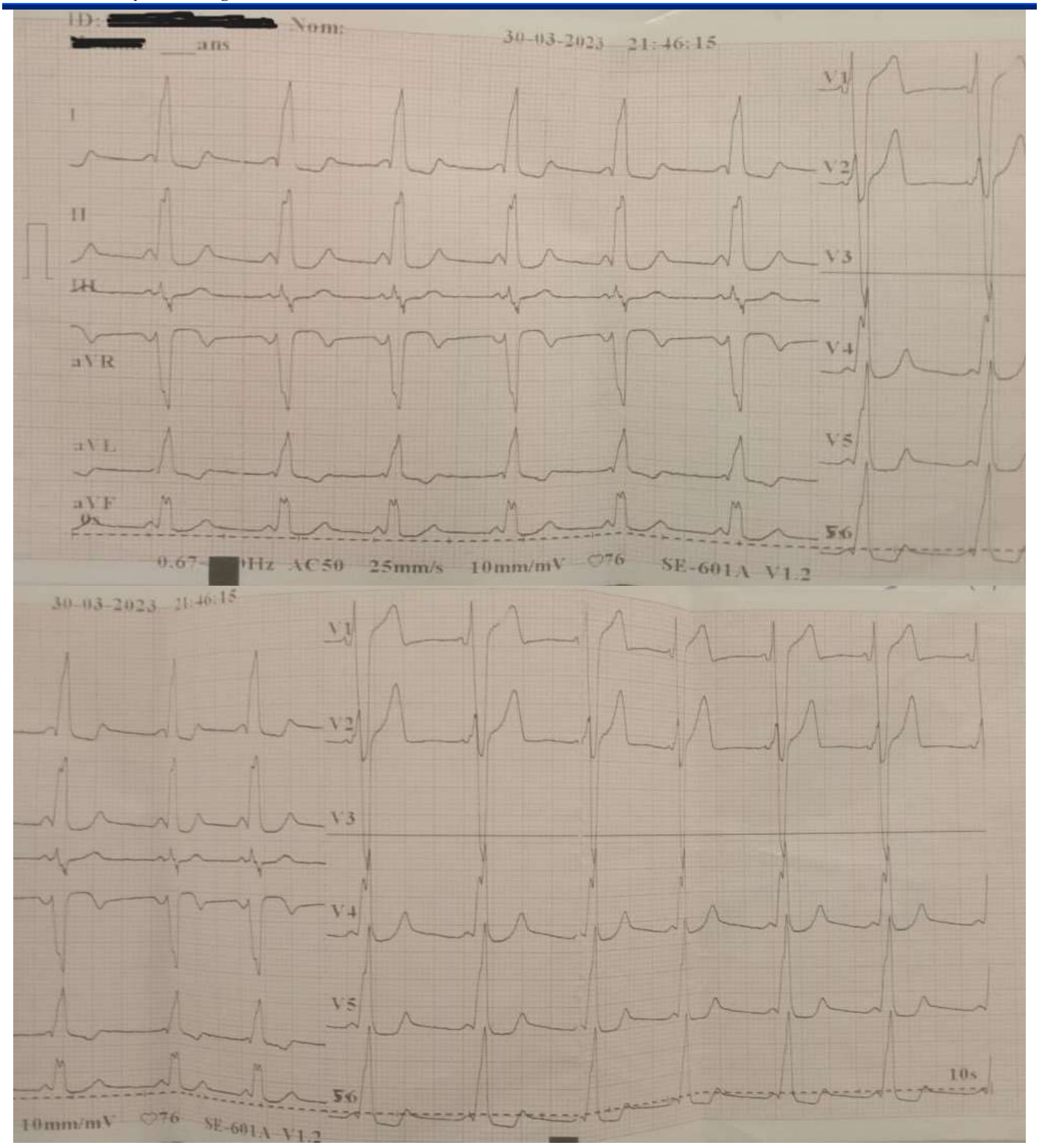

Fig. 1: Our patient ECG with short PR interval and delta wave. Left bundle branch block.

Discussion

In a normal heart, the sinoatrial node (SAN) is the physiological pacemaker that controls the cardiac rhythm. The SAN generates an action potential, an electrical current of the order of few millivolts, which travels through the two atria, causing them to contract simultaneously. Then, the impulse converges at a relay point, the atrioventricular node

(AVN), and travels through the two ventricles, causing them to contract synchronously [3]. WPWS is thought to develop during early stages of cardiogenesis, with the formation of one or more accessory nodal pathways that provide anatomical support for ventricular pre-excitation. Indeed, in case of WPWS the ventricle is stimulated earlier by the accessory pathway than it would have been if the impulse had followed the atrio-ventricular conduction system [3]. As a result, patients with WPWS presents recurrent paroxysmal episodes of supraventricular tachycardia. While some patients remain asymptomatic, others may present palpitations, chest pain, dizziness, or episodes of syncope [1]. Symptomatic patients have an approximative risk of 0.25% per year or 3% to 4% over a lifetime to develop malignant arrhythmia leading to sudden death [4]. As in the case of our patient, pregnancy tends to uncover asymptomatic pre-excitation to tachyarrhythmias due to the physiological changes of pregnancy, such as increased blood volume, cardiac output and heart rate, increased stress and anxiety acting on the sympathetic nervous system, and increased oestrogen which can alter heart rhythm [3, 5]. On the electrocardiogram, WPWS presents as a short PR interval and prolonged QRS with an initial slurring upstroke in the presence of sinus rhythm [6]. It is of interest to note that there are two distinct types of WPWS according to the atrioventricular re-entrant tachycardia (AVRT): orthodromic AVRT (with a narrow QRS complex of ≤ 0,08 seconds) and antidromic AVRT (with a wide QRS complex of ≥ 0,12 seconds) [7]. Managing a WPWS in a pregnant women may be challenging. The American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology recommend acute conversion of supra-ventricular tachycardia as soon as it occurs. It is recommended to start with nonpharmacological measures (carotid sinus massage, Valsalva manoeuvre and facial immersion). As a second-line option, certain drugs can be safely used in pregnant patients including adenosine, beta-blockers, and calcium channel blocker. Due to its short half-life Adenosine is considered the drug of choice [8]. Note that the above-mentioned drugs can be used in WPW patients with orthodromic AVRT while they may be life threatening in those with antidromic AVRT [7]. Catheter ablation, with radiation-reduction technologies, can be a therapeutic alternative in highly symptomatic pregnant women. However, this procedure should be avoided in the first trimester when the teratogenic risk is greater [9, 10]. Regarding the anaesthetic management of WPWS a pregnant patient posted for caesarean section, regional anaesthesia is preferred over general anaesthesia as multidrug administration, laryngoscopy stimulation, intubation and light planes leads to sympathetic stimulations. Also, epidural anaesthesia is preferred to the spinal due to controlled and segmental block with better hemodynamic stability [11]. In our patient, the C section was performed under combined spinal epidural anaesthesia due to its reliable and profound block, prolonged duration, hemodynamic stability, and post-operative pain management. Our patient experienced two episodes of SVT which were successfully controlled by vagal manoeuvres.

Conclusion

Wolff-Parkinson-White syndrome (WPWS) is a rare condition characterized by the existence of one or more accessory nodal pathways that provide anatomical support for ventricular pre-excitation. While some patients remain asymptomatic, others may present symptoms such as palpitations with a risk of sudden death. Findings on ECG are characteristic including a short PR interval and prolonged QRS with a delta wave in the presence of sinus rhythm. Through the report of our case, we aim to draw attention on pregnancy as an event that tends to uncover asymptomatic pre-excitation to tachyarrhythmias, and that complicates therapeutical management of this condition since the majority antiarrhythmics should be regarded as potentially toxic to the foetus.

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