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WOLFF PARKINSON SYNDROME: DIAGNOSIS AND THERAPEUTIC ADVANCES

Cardiology

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ABSTRACT

Wolff-Parkinson-White (WPW) syndrome was first described by Louis Wolff, John Parkinson, and Paul Dudley White in 1930.[1] This cardiac condition is characterized by an abnormal accessory pathway that predisposes patients to tachyarrhythmias. A 45-year-old female patient with chief complaints of chest pain and palpitations for one day. An ECG revealed a short PR interval, broad QRS complex and delta wave, leading to a diagnosis of WPW syndrome. Advanced imaging and electrophysiological studies confirmed the presence of an accessory pathway. Treatment options were discussed, including antiarrhythmic medications and radiofrequency catheter ablation (RFCA). WPW syndrome is associated with a risk of sudden cardiac death, but advancements in diagnostic and therapeutic techniques have significantly improved the prognosis. RFCA is particularly noted for its high success rate and low complication profile, offering a potential curative solution for many patients.

KEYWORDS

Radiofrequency catheter ablation (RFCA), Tachyarrhythmias, ECG

INTRODUCTION

Wolf–Parkinson–White (WPW) syndrome is a condition marked by the presence of at least one accessory pathway (AP), which can lead to the development of atrial or ventricular tachyarrhythmias and has the potential for causing sudden cardiac death. It is the second most prevalent cause of paroxysmal supraventricular tachycardia globally, impacting approximately 0.1–0.3% of the general population.[2]

Management strategies for patients with WPW syndrome can differ widely, ranging from observation of the accessory pathway to pharmacological interventions or radiofrequency ablation. Many individuals with ECG findings indicative of WPW syndrome do not experience any symptoms, allowing them to forego medical treatment unless specific circumstances arise.

Case Description

A 45-year-old female patient was admitted to our hospital presenting with chest pain and palpitations that had persisted for one day. Accompanying these symptoms, she also experienced a mild fever, though she did not report any cough. The patient had no prior history of heart disease, hypertension, nor any family history of sudden death. Upon admission, her temperature was recorded at 99°F, and her blood pressure was 130/80 mmHg. An examination revealed a irregular heart rhythm, and no murmurs were detected in any of the heart valves.

Diagnostic Assessment

The patient's initial evaluation revealed a negative troponin I level and a neutrophil percentage of 54%, with a total leukocyte count of 6,300 cells/μL. An echocardiogram showed mild mitral and tricuspid regurgitation, mild pulmonary artery hypertension, and mild concentric left ventricular hypertrophy. Importantly, no pericardial effusion, vegetations, or clots were detected. Cardiac Doppler studies confirmed the echocardiographic findings.

The main challenges arose from rare abnormalities observed in the patient's ECG, which included a posterior left anterior fascicular block, complete right bundle branch block, and a possible inferior myocardial infarction. These findings led to a diagnosis of supraventricular tachycardia associated with Wolff-Parkinson-White syndrome.

ECG findings reveal a short PR interval, broad QRS complex and delta wave seen indicating the probable diagnosis of WPW syndrome. Confirmatory diagnosis made after electrophysiological study. [Figure 1]

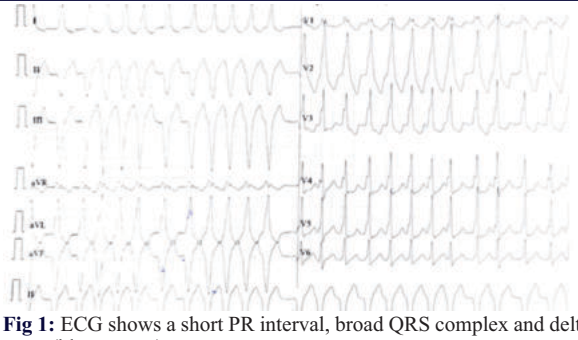

Fig 1: ECG shows a short PR interval, broad QRS complex and delta wave (blue arrows)

Therapeutic Intervention

Given the variability in the ECG and the potential risk for sudden cardiac death, the clinicians administered intravenous amiodarone as an emergency intervention. The patient was subsequently treated with a regimen of oral amiodarone, atorvastatin, nitroglycerin, and metoprolol, and plans were made for an electrophysiological study and ablation therapy at a later date. The patient was also managed with antiemetics, antiplatelet agents, and other supportive care. After 3 months we called the patient for EPS (electrophysiological study) and at the same time we did radio frequency ablation therapy Over time, the patient's condition improved, and she was discharged in stable and normal condition. [Figure 2]

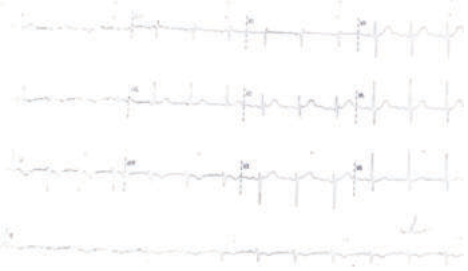

Fig 2: Post radiofrequency ablation therapy ECG shows a normal Sinus rhythm

DISCUSSION

Wolff-Parkinson-White (WPW) syndrome occurs in approximately 2 out of every 1,000 individuals in the general population. The presence

of an accessory pathway in patients with WPW can lead to tachyarrhythmias that might exhibit specific electrocardiographic features, potentially leading to misdiagnosis and inappropriate treatment, which could result in serious complications. [3] In WPW, there is rapid anterograde conduction through the bundle of Kent, known as the accessory pathway, which can surpass the slower conduction through the AV node. This rapid conduction causes unique ECG characteristics, including the hallmark delta wave, a wide QRS complex, and a short PR interval. These findings also seen in our patient's ECG. Detecting electrocardiographic abnormalities in patients with WPW can be challenging since the accessory pathway may not always be activated in an anterograde manner at baseline. [4-5] Patients who undergo accessory pathway ablation can develop large peaked T waves in the same leads along with the delta wave, which was also notable, with concordant polarity. This is more commonly seen in delta and T waves positive leads.

Certain medications, including beta-blockers, calcium channel blockers (such as Diltiazem and Verapamil), Digoxin, and adenosine, should be avoided in patients with Wolff-Parkinson (WPW) syndrome as they can enhance conduction through the accessory pathway. [6] Young patients with WPW might not exhibit the characteristic short PR interval or delta waves, so a thorough investigation is essential if they present with collapse. WPW tachycardia can be associated with underlying conditions like infection, pulmonary embolism, or dehydration.[7]

The prognosis for WPW patients has significantly improved due to advancements in antiarrhythmic medications and ablation techniques. [8] Successful ablation is often indicated by the classic post-ablation memory T-wave pattern. Radiofrequency catheter ablation (RFCA) is particularly effective, offering a high success rate, low complication rate, and the potential for a curative outcome.

Declaration Of Patient Consent

The authors certify that they have obtained all necessary patient consent forms. In these forms, the patients have provided their consent for clinical information to be included in the journal. The patients understand that their names and initials will not be published.

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Nil

Conflicts Of Interest

There are no conflicts of interest

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