CASE REPORT

# Anesthetic Challenges in the Management of Parturient with Wolff-Parkinson-White Syndrome Posted for Elective Cesarean Section

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**ABSTRACT**

Wolf-Parkinsons-White (WPW) syndrome is a pre-excitation syndrome which pre-disposes a patient to supraventricular arrhythmias and sometimes sudden death. These complications are precipitated during pregnancy, labor, perioperative period, and anxiety. The management of these complications poses a challenge to anesthesiologists. Considering to rarity of the case and paucity of data available, we decided to report a case of WPW syndrome in preterm, primigravida with severe oligohydramnios. This case was managed successfully under spinal anesthesia.

**Key words:** Anesthetic challenges, cesarean section, spinal anesthesia, Wolff-Parkinson-White syndrome

## INTRODUCTION

Wolff-Parkinson-White (WPW) syndrome is a pre-excitation syndrome, which results from an abnormal accessory pathway connecting the atria and ventricles, predisposing to supraventricular arrhythmias and even sudden death.[1] Incidence of the pre-excitation syndrome varies from 0.1 to 3/1000 in healthy subjects.[2] Patients with Wolff-Parkinson-White (WPW) syndrome can be asymptomatic or may present with cardiac symptoms such as palpitation or exertional dyspnea. The diagnosis is done by the patient's history and the classic electrocardiograph (ECG) findings, which show a shortened PR interval (<270 ms), delta waves, and widened QRS complex. Other findings may be ST depression and associated atrial fibrillation (AF). Under anesthesia, the physiology of conduction changes and arrhythmias can precipitate (paroxysmal supraventricular tachycardia [SVT] and AF). Thus, it is important to know about the management of a case of WPW syndrome.

Considering the rarity of the case and the paucity of data available for the management of such cases for the lower segment caesarean sections under the subarachnoid block, we present in this case report, the management of WPW syndrome in a preterm primigravida with severe oligohydramnios.

## CASE REPORT

A 29-year-old primigravida at 35 weeks of gestation presented with pain in abdomen and chest discomfort. She was diagnosed with WPW syndrome 2 years ago, when she presented with palpitations and chest discomfort, and a 12 lead ECG was taken. She was started on Tab diltiazem 120 mg SR OD which was withheld before planned conception. She was prescribed with anti-anxiety drugs as symptoms were usually precipitated by anxiety. She was posted for an elective cesarean section because of oligohydramnios (amniotic fluid inde×4) and prolonged labor. Consultation with the cardiologist was done.

On pre-anesthetic examination, the patient had tachycardia (130/min) which settled to around 80/min with Tab labetalol 100 mg, blood pressure was 118/82 mmHg and pre-operative $SpO_2$ was 99% on room air. Auscultation findings were within normal limits. ECG showed decreased PR interval, delta waves (slurred upstroke of QRS), wide QRS and associated ST and

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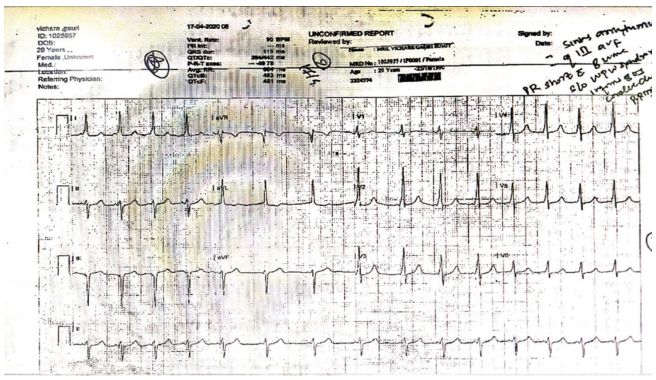
T wave changes. The two-dimensional echocardiography was suggestive of normal valvular and ventricular function with an ejection fraction of 60% and no structural defects. Airway and spine examination was normal. Laboratory tests including complete hemogram, liver function test, renal function test, serum electrolytes, and coagulation profiles were within normal limits. The patient and relatives were counseled and high-risk consent was taken. Need for post-operative intensive care unit stay was explained.



Pre-operative ECG in labor room shows decreased PR interval, delta waves (slurred upstroke of QRS), wide QRS, and associated ST and T wave changes.

The patient was fasting for 8 h before induction. Intravenous (IV) access secured with the 18-G cannula and premedicated with anti-aspiration prophylaxis of Inj. Metoclopramide 10 mg IV Inj. Pantoprazole 40 mg IV slowly and Inj. cefazolin 2 g IV. All emergency drugs (diltiazem, adenosine, lignocaine, esmolol, amiodarone, and adrenaline) were kept ready. A defibrillator was charged and kept ready. In the operating room, routine standard monitoring NIBP, pulse oximeter ($SpO_2$), and 5 leads ECG were attached as per American Stroke Association guidelines. To avoid sympathetic stimulation during intubation and emergence, we planned to perform the case under spinal anesthesia. The patient was co-loaded with 500 ml of Ringer's lactate solution. Under aseptic precautions, a subarachnoid block was administered with 27 G Whitacre spinal needle and 2.4 ml of 0.5% hyperbaric bupivacaine with 60 mcg of buprenorphine was administered in sitting position.

The patient was turned to the supine position, with a wedge placed under the right hip and adequate level was achieved. There was no hemodynamic disturbance throughout the procedure. After baby delivery, Inj. Pitocin was administered as 5 units IV bolus over 10 min followed by 15 units in 500 ml of Ringer's lactate solution.

No tachycardia was observed throughout the procedure. Uterus was well retracted and repositioned. Intrathecal buprenorphine, a tramadol 100 mg as a rectal suppository and Tab paracetamol 500 mg (if required) provided adequate pain relief. The patient was shifted after application of dressing and observed for 24 h. The subsequent post-operative recovery was uneventful for both mother and baby. She was discharged after 4 days of stay.

## DISCUSSION

In 1893, the physiologist Kent reported the existence of atrioventricular (AV) pathways in mammalian hearts,[3] while in 1930, the cardiologists WPW described an "unusual cardiac mechanism" manifested as paroxysmal tachycardia or AF and characterized by a bundle-branch block and a short PR interval on the ECG.[4] The main pathophysiological characteristic of the syndrome is the existence of an accessory AV pathway, named "bundle of Kent."[5] It may connect the left atrium and ventricle (type A), or the right atrium and ventricle (type B), and can conduct the stimuli bidirectionally.[6]

Many individuals with a WPW-pattern may remain asymptomatic for life; patients with WPW-syndrome usually develop arrhythmias between the ages 20 and 40 years. The commonest symptom is palpitations, while dizziness, lightheadedness, chest pain, shortness of breath, and episodes syncope may also occur. Rarely, the first manifestation of the disorder is cardiac arrest.[6] A detailed cardiac history during pre-anesthetic evaluation is the cornerstone to suspect WPW syndrome.[7]

Pregnancy is a pro-arrhythmic state due to an increase in circulating estrogens, intravascular volume expansion, hemodynamic changes, pain, stress, and the use of oxytocin during labor.[8,9] All commonly used anti-arrhythmic drugs cross the placenta and are secreted in breast milk thereby affecting fetal wellbeing. For these reasons, non-pharmacological treatment such as vagal maneuver must be initiated first and pharmacological management is to be instituted in patients with hemodynamic instability.[10] These patients should ideally undergo conduction studies and ablation of aberrant pathways before a planned pregnancy.[10] The American College of Cardiology/American Heart Association/European Society of Cardiology guidelines recommend the use of IV propranolol or metoprolol if adenosine fails, and if arrhythmia persists it recommends the use of verapamil.[11] In case of AF, drugs that prolong refractoriness in accessory pathways (procainamide, and propranolol) must be used and verapamil and digoxin must be avoided. Electrical cardioversion should be considered in case of hemodynamic compromise or ventricular fibrillation.[12]

The aim of anesthesia management is

1. Avoid sympathetic stimulation such as pain, anxiety,
2. Avoid stress response to intubation,
3. Avoid hypovolemia,
4. Avoid hypothermia,
5. Avoid hypoxia.

The subarachnoid block has significant advantages over general anesthesia as it provides profound analgesia, prevents abnormal central sensitization to noxious stimuli, avoids poly-pharmacy, sympathetic stimulation due to laryngoscopy, and a lighter plane of anesthesia.[8] Pre-loading and lateral tilt are useful to maintain pre-load and cardiac output, prevent hypotension with compensatory tachycardia that may trigger SVT in these patients. Phenylephrine is effective for treating hypotension as it prevents tachycardia.[8] Caution is needed with the height of the sympathetic blockade, because sinus bradycardia and intra-cardiac conduction defects may develop if the thoracic (T1 to T4) cardio-accelerator fibers are blocked.[13]

## CONCLUSION

Increased vigilance during intraoperative and post-operative cardiovascular monitoring is mandatory as these patients are at a high risk of developing life-threatening arrhythmias. Antiarrhythmic drugs and defibrillator must be kept ready. Adequate coloading and treatment of hypotension with phenylephrine must be preferred.

We conclude that a case of a parturient with WPW syndrome posted for elective cesarean section was managed successfully under spinal anesthesia with good maternal and neonatal outcome.

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