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Wolff Parkinson White Syndrome: Anaesthesia Management in Lower Limb Fractures

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Abstract

Wolff-Parkinson-White (WPW) syndrome is defined as a congenital condition involving abnormal conductive cardiac tissue between the atria and the ventricles that provides a pathway for a reentrant tachycardia circuit. Considering the rarity of the case and paucity of data available for the management of such cases under spinal anesthesia, we take this as an opportunity to relearn the steps needed for successful Anesthetic management.

Keywords: Aberrant Pathway, Arrhythmias, Regional Anaesthesia.

Introduction

In 1930, Wolff, Parkinson and White described a series of young patients who experienced paroxysms of tachycardia and had characteristic abnormalities on electrocardiography (ECG). About 40% of people with the electrical problem never develop symptoms. Symptoms can include an abnormally fast heartbeat, palpitations, shortness of breath, light headedness, or syncope. Rarely cardiac arrest may occur [1]. The most common type of irregular heartbeat that occurs is known as paroxysmal supraventricular tachycardia

CASE

A case of a 25 year old male who presented with fracture both bone leg and fracture shaft of femur to our pre anaesthetic check-up clinic. Patient had sustained these injuries due to road side accident and also had a history of loss of consciousness for about 12 hours. Patient had no past history of chest pain, breathing difficulty or any seizure disorder. Vitals were stable and systemic examination revealed normal first and second heart sounds and normal vesicular breath sounds. All routine examinations were ordered that included complete haemogram, bleeding time, clotting time, blood urea, blood sugar and serum electrolytes and electrocardiography.

Electrocardiography of the patient revealed several significant changes (Figure 1). Short P-R interval with rSRpattern , reciprocal T wave changes and also delta waves were present .2D- echo showed ejection fraction of 60% with normal ventricular and valvular function.

On the day before surgery patient was given tablet ranitidine 150mg orally 1 HS and at 7a.m. in the morning. Availability of antiarrythmics like adenosine, lignocaine, amiodarone, phenylephrine, and inotropes was confirmed. For surgery all routine monitors were attached including electrocardiography, pulse oximetry and blood pressure cuff. The patient was preloaded with 500 ml of ringer lactate. Under all aseptic precautions with patient in sitting position sub arachnoid block was given using a 23 G

quincke's spinal needle with 2.2 ml of bupivacaine 0.5% heavy and 15microgram fentanyl. Level of anaesthesia was kept up to T-10 sensory level. Patient was closely monitored during the intraoperative period and surgery proceeded uneventfully.(figure 2)

Discussion

WPW syndrome is a cardiac disorder involving an anomalous AV conduction via accessory pathway directly from the atrium to the ventricle. In most cases, this pathway is the "kent" pathway. The cardiac anomaly most frequently associated with this problem is Ebstein's anomaly [2]. Traditionally, WPW syndrome is classified in two types, Type A and type B. On ECG, Type A resembles right bundle branch block with right ventricular hypertrophy and posterior myocardial infarction, whereas type B resembles left bundle branch block with left ventricle hypertrophy[2]. The most important complications occurring in these patients are PSVT and atrial fibrillation. Supraventricular tachycardia, also described as re-entrant tachycardia, is the result of premature activation of ventricle.

WPW syndrome has been reported under both general as well as regional anaesthesia. Regional anaesthesia is preferred in haemodynamically stable patients as it avoids polypharmacy as well as the stress response associated with laryngoscopy and intubation.(3) However sudden bradycardia and hypotension can result from sympathetic blockade after spinal anaesthesia which can be avoided by using low dose local anaesthetic supplemented with opioids if required. The level of sensory blockade should be closely monitored. Epidural anaesthesia has an added advantage of post operative analgesia and better hemodynamic stability. If general anaesthesia is opted the goal is to avoid light plane of anesthesia as well as the drugs that can precipitate tachycardia as these can precipitate arrhythmias. Propofol is the choice for induction as it has been shown to inhibit delta waves. Fentanyl and midazolam have no effect on the elecrophysiologic potential of accessory pathway. Isoflurane and sevoflurane are preferred over halothane for maintenance. Among the muscle relaxants pancuronium needs to be avoided.(4)

We opted for spinal anaesthesia for our patient with low dose local anaesthetic combined with opioid. The level of sensory blockade ws closely monitored and hemodynamics were maintained. Adequate preloading was done to maintain proper atrial filling and the need for sympathomimetics as there use can lead to tachycardia. The treatment for fracture shaft of femur is open reduction and internal fixation during which blood loss may be substantial. Muscle relaxation may increase blood loss and inhaled anaesthetics are best to avoid in many of these patients.

Despite taking all precautions, If PSVT is precipitated, initially vagal maneuvers should be tried. In hemodynamically unstable patients, emergent conversion of rhythm to sinus via a brief atrioventricular block is the goal. Lignocaine or adenosine 6-12 mg or beta blockers (Esmolol, 50-300 μg/kg/min IV) can be administered intravenously to break a re-entrant tachycardia. Class-I anti-arrhythmic drugs such as disopyramide and procainamide can be used. These drugs block transmission via the accessory pathway by blocking fast sodium channel [4].

Conclusion

A patient with WPW syndrome can be managed successfully under spinal anaesthesia provided the block level is cautiously monitored. Also, thorough understanding of pathophysiology of WPW syndrome, intensive preoperative evaluation and meticulous intraoperative monitoring is essential [6].

Footnotes

Source of Support: Nil

Conflict of Interest: None declared.

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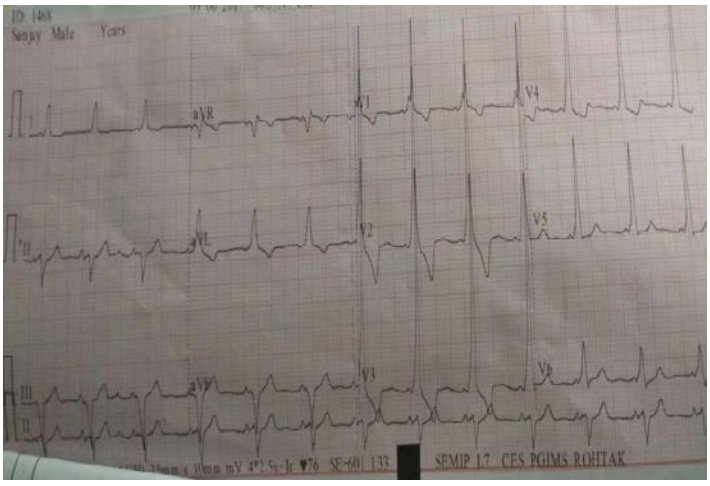

Figure 1: Preoperative ECG of Patient

Figure 2: Intra-Operative Vitals Monitoring