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Case Report

Supraventricular tachycardia in the immediate postpartum - A clinical Diagnostic dilemma

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ABSTRACT

Background: Supraventricular tachycardia (SVT) is the most common arrhythmia during pregnancy, with an estimated incidence of 1 in 4,000 pregnancies. While SVT during pregnancy and labour is well-documented, its occurrence in the immediate postpartum period—particularly following caesarean section—remains underreported and poorly understood.

Case Presentation: We present two cases of paroxysmal SVT occurring within hours of caesarean delivery in previously healthy women without structural heart disease. The first case involved a 27-year-old primigravida with hypothyroidism who developed symptomatic SVT two hours postoperatively, managed successfully with intravenous diltiazem. The second case featured a 32-year-old multigravida with intrahepatic cholestasis of pregnancy and twin gestation, who similarly developed SVT shortly after surgery and responded promptly to pharmacological intervention. In both cases, echocardiography was normal and no precipitating factors such as haemorrhage, sepsis, or electrolyte imbalance were identified.

Discussion: These cases highlight the diagnostic and therapeutic challenges of SVT in the immediate postpartum period. Physiological changes in pregnancy, catecholamine surges, and hemodynamic stress may contribute to arrhythmogenesis. Prompt recognition and management with rate-controlling agents such as diltiazem led to favourable outcomes. Both patients were initiated on low-molecular-weight heparin for thromboprophylaxis after stabilization.

Conclusion: SVT in the immediate postpartum period, though rare, warrants high clinical suspicion, especially in hemodynamically unstable patients with tachycardia. A multidisciplinary approach involving cardiology, obstetrics, and anaesthesia is essential. Timely intervention can prevent complications and support safe maternal recovery. Further research is needed to establish standardized management protocols for SVT in the postpartum setting.

Keywords: *Supraventricular tachycardia, postpartum arrhythmia, cesarean section, diltiazem, maternal tachycardia, pregnancy, SVT, cardiac arrhythmia in pregnancy.*

INTRODUCTION

Supraventricular tachycardia (SVT), the most common arrhythmia in pregnancy, occurs in approximately 1 in 4,000 pregnancies, with recurrence in up to 20% of those with a prior history.(1) Though typically benign, SVT in pregnancy increases the risk of caesarean delivery and preterm labour, warranting prompt recognition and coordinated care.(2) Numerous studies have documented the prevalence and management of SVT during pregnancy, as well as its association with adverse obstetric outcomes; however, reports of SVT in the postpartum period remain scarce.(3) In this context, we

present two cases of SVT occurring in the immediate postoperative period following caesarean delivery, in women without known structural heart disease.

case 1

A 27-year-old primigravida at term with fetal growth restriction and hypothyroidism with no prior cardiac or pulmonary disease, underwent elective cesarean section under spinal anesthesia. Intraopertaive period was uneventful with stable vitals and no post partum hemorrhage. Two hours postoperatively, she developed palpitations without chest pain, dyspnea, dizziness, syncope, or fever. Examination revealed tachycardia (170–180 bpm), hypotension (80/40 mmHg) (hemodynamically unstable) with normal oxygen saturation. Chest auscultation was clear except for tachycardia. Postpartum hemorrhage, intra-abdominal bleeding, sepsis, electrolyte imbalance and hyperthyroidism were excluded. Electrocardiogram (ECG) confirmed paroxysmal supraventricular tachycardia (PSVT) (figure1), echocardiography (ECHO)- normal ejection fraction with no structural heart disease. She was treated with intravenous fluids and 12.5 mg diltiazem (calcium channel blocker) as per cardiology advice, resulting in restoration of sinus rhythm and symptomatic relief and remained asymptomatic with no further episodes. Low-molecular-weight heparin (LMWH) was initiated 12 hours postpartum.

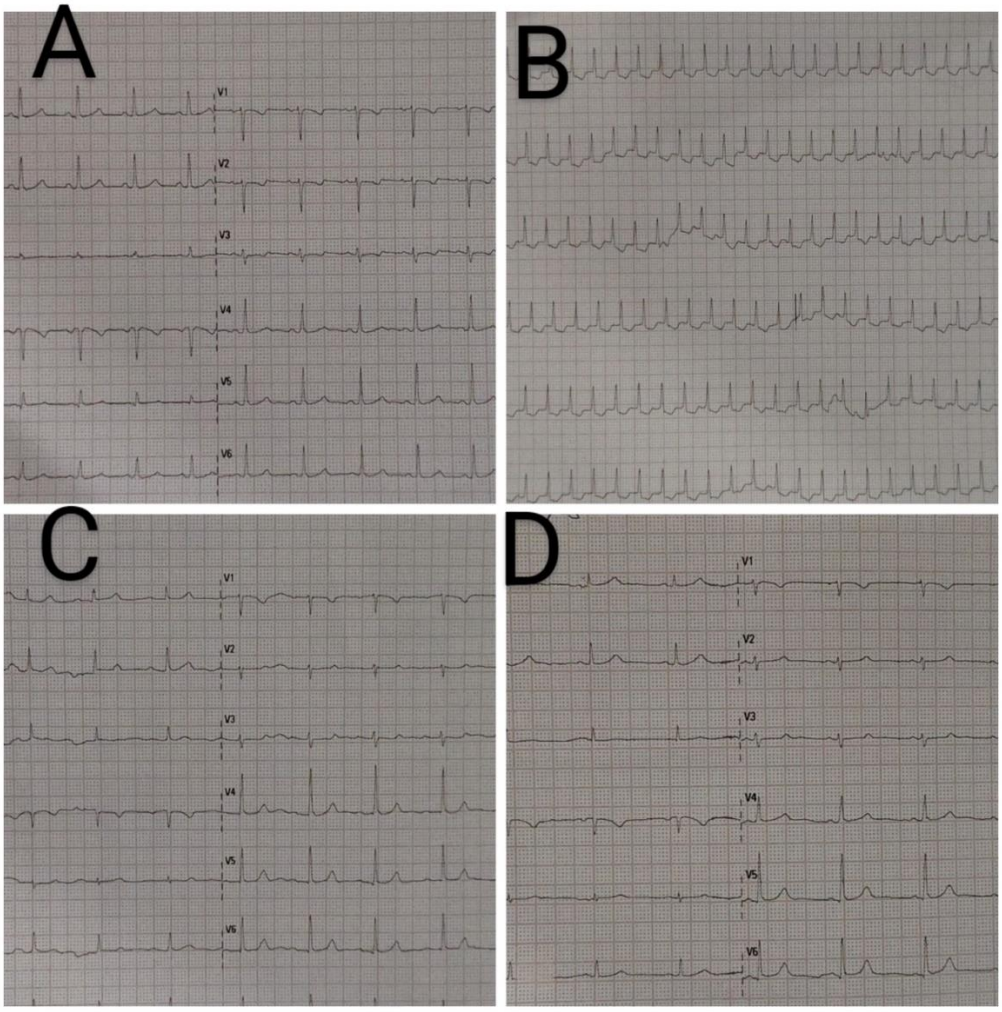

Figure 1: A- Preoperative ECG with normal sinus rhythm
B- Immediate post operative SVT
C- Sinus rhythm following treatment
D- Post treatment day 1 follow up ECG showing normal sinus rhythm

Case 2

A 32-year-old woman, second gravida at 36 weeks with monochorionic diamniotic twins, intrahepatic cholestasis of pregnancy and previous uncomplicated LSCS, underwent emergency LSCS under spinal anaesthesia for labour with a history of prior caesarean. The intraoperative course was uneventful with stable vitals. Postoperatively her vitals were 150/90 mmHg, , her pulse rate surged to 200 bpm without other causes like PPH.. She complained of palpitations but denied chest pain, dyspnoea, dizziness, or other associated symptoms. ECG revealed supraventricular tachycardia (SVT) (figure.2) , which reverted to normal sinus rhythm following administration of intravenous diltiazem. She was initiated on

oral diltiazem once daily. Post-treatment pulse was 90 bpm with normal ECG and ECHO showing no structural abnormalities. Low molecular weight heparin(LMWH) was commenced 12 hours postoperatively.

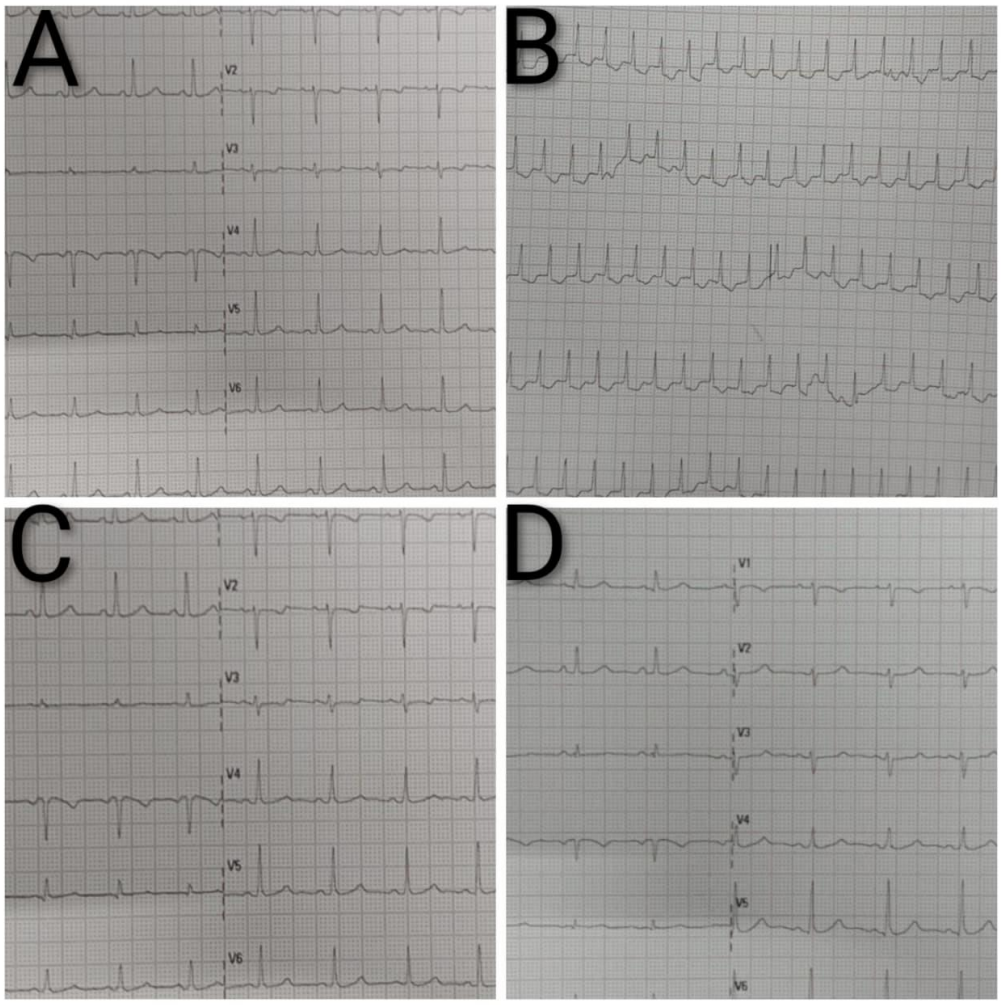

Figure 2: A- Preoperative ECG with normal sinus rhythm
B- Immediate post operative SVT
C- Sinus rhythm following treatment
D- Post treatment day 1 follow up ECG showing normal sinus rhythm

DISCUSSION

Supraventricular tachycardia (SVT) is a tachyarrhythmia characterized by a heart rate exceeding 120 beats per minute. It may present with palpitations, dyspnea, chest tightness, circulatory instability, or may remain asymptomatic. SVT is frequently paroxysmal, characterized by sudden onset and spontaneous resolution. Such paroxysmal episodes with abrupt onset and offset pose diagnostic and management challenges due to their variable presentation, warranting careful evaluation to distinguish physiological causes from pathological arrhythmias.(4) (5)

Recent large-scale cohort data demonstrate that maternal heart rates often exceed previously accepted norms during pregnancy, with more than 10% of healthy individuals exhibiting rates above 100 bpm from 18 weeks' gestation onwards. This variability challenges the establishment of a definitive upper limit for normal heart rate in pregnancy. A threshold of 100 bpm risks excessive, potentially unwarranted investigations, whereas 120 bpm may provide false reassurance, increasing the likelihood of overlooked pathology. Therefore, persistent tachycardia warrants thorough clinical assessment to exclude underlying disease.(6)

The pathogenesis of supraventricular tachycardia (SVT) in pregnancy is intricate and multifactorial. Physiological adaptations—including fluctuations in hormonal milieu, dysregulation of the autonomic nervous system, and hemodynamic modifications—can precipitate or exacerbate the onset of arrhythmias. During labour, common precipitants of SVT encompass catecholamine surges, electrolyte disturbances such as hyperkalaemia, and the administration of vasopressors (such as ephedrine) to counteract post-epidural or post spinal hypotension during caesarean . At term, maternal cardiac output rises to approximately 10 litres per minute, engendering increased mechanical stress on myocardial tissue,

thereby potentially facilitating the emergence of tachyarrhythmias. Some clinicians recommend caesarean delivery for patients with SVT, citing the elevated catecholamine release associated with vaginal delivery as a potential precipitating factor—contrasting with the SVT episodes observed postpartum following caesarean in our case.

Management of supraventricular tachycardia (SVT) in pregnancy is largely consistent across trimesters, with minor variations. Vagal maneuvers remain the first-line non-pharmacologic treatment and are well tolerated throughout gestation. Atenolol (beta blockers) and verapamil (calcium channel blocker) are effective in the second and third trimesters but contraindicated in the first. Intravenous adenosine is safe and effective at all stages, including labor, with higher conversion rate to sinus rhythm. Electrical cardioversion is reserved for hemodynamically unstable or drug-refractory cases and is generally safe, though it may trigger preterm labor in the third trimester. Non-fluoroscopic catheter ablation offers definitive, recurrence-free treatment.(7) (5) (8)Women with SVT also require meticulous assessment of venous thromboembolism risk to guide appropriate use of low- or high-dose low-molecular-weight heparin (LMWH).

Hence, proactive identification of SVT, beginning as early as preconception counselling, Personal and family histories of cardiac disease or sudden death in family along with application of risk assessment scores (CARPREG, ZAHARA and modified WHO) are as critical as obstetric history (9). This coupled with coordinated multidisciplinary strategy, Cardio-obstetrics subspecialty dedicated to enhancing maternal and fetal outcomes in pregnancies complicated by cardiovascular disease is essential to minimize risks and optimize care in this high-risk group.(10)

CONCLUSIONS

SVT in pregnancy remains a relatively rare but clinically significant condition, with limited large-scale data to guide standardized management. Successful outcomes rely on a multidisciplinary approach involving obstetricians, cardiologists, and anesthesiologists, along with regular antenatal follow-up and vigilant maternal and fetal monitoring and diligent post operative care. Prompt and accurate diagnosis, along with appropriate use of physiological interventions and pharmacological agents is critical. It is essential that labour wards are equipped with antiarrhythmic drugs like adenosine and calcium channel blockers for emergency use. The mode of delivery should be based on obstetric indications rather than SVT alone, as current evidence does not support routine caesarean section solely to prevent SVT episodes during labour. However, further studies—particularly prospective and large-scale research—are needed to better understand the optimal management strategies for SVT during labour and delivery.

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