

# Anesthetic Management of Intraoperative Atrioventricular Tachyarrhythmia in a Postpartum Patient Posted for Laparotomy

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## Abstract

Supraventricular tachycardia is the most common sustained arrhythmia presenting in pregnancy. The increase in frequency of arrhythmias and in symptoms during pregnancy may be a result of associated hemodynamic, hormonal, autonomic, and emotional changes. A 21-year-old, post-partum patient on the 5<sup>th</sup> postoperative day was posted for laparotomy in view of pelvic abscess. Surgery was started, and after opening the abdomen, 1–1.5 L pus was drained and a lot of adhesions were noted in pelvic region. Intestinal adhesiolysis and thorough peritoneal wash were performed. In intraoperative period, suddenly, patient's heart rate was increased to 233 bpm and blood pressure dropped to 80/60 mmHg. Resuscitated with fluids, blood and drugs like phenylephrine to improve blood pressure. In spite of these resuscitative efforts heart rate was fixed at 233/min with blood pressure improved to 110/80 mmHg. A cardiologist opinion was taken and they diagnosed it as atrioventricular reentrant tachycardia and advised injection adenosine 6 mg intravenous (IV). After adenosine IV bolus, heart rate dropped transiently up to 60 bpm and later stabilized at preoperative basal heart rate of 132 bpm with blood pressure of 128/80 mmHg. The most important aspect in treating tachyarrhythmia patients is the use of a multidisciplinary approach. The decision of what therapy to use must be addressed on a case-by-case basis with special attention to the patient's individual issues and concerns.

**Keywords:** Adenosine, atrioventricular tachycardia, laparotomy, postpartum patient

## INTRODUCTION

Supraventricular tachycardia (SVT) is the most common sustained arrhythmia presenting in pregnancy with 1.2/1000.<sup>[1]</sup> Paroxysmal atrioventricular (AV) nodal reentrant tachycardia is an infrequently encountered supraventricular arrhythmia that continues to present difficult management problems in the critically ill surgical patient.<sup>[2]</sup> Hence, these arrhythmias require immediate and accurate management to prevent untoward complications. Treatment options include pharmacological, nonpharmacological, electrocardioversion, and radiofrequency ablation.<sup>[2]</sup>

We do hereby present the case of successful management of paroxysmal AV reentrant tachycardia (AVNRT) presented during intraoperative period in a postpartum patient posted for laparotomy.

## CASE REPORT

A patient diagnosed to have postpartum pelvic abscess secondary to previous lower-segment caesarean section being

in sepsis, septic shock, and early multiple organ dysfunction syndrome was posted for laparotomy. The patient was accepted under American Society of Anesthesiologists grade IV E and attenders have explained the need for postoperative ventilation, Intensive Care Unit stay, and invasive monitoring.

Surgery was started, and after opening the abdomen, 1–1.5 L pus was drained and a lot of adhesions were noted in the pelvic region. Intestinal adhesiolysis was done and thorough peritoneal wash was performed. During that period, suddenly, patient's heart rate was increased to 233 bpm with regular rhythm and blood pressure dropped to 80/60 mmHg. On peripheral pulse examination, severe tachycardia was noted, and pulse oximetry showed 233 bpm with regular rhythm. Phenylephrine

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50 mcg bolus twice was given and blood pressure improved to 110/80 mmHg with no change in heart rate fixed at 233 bpm. Figure 1 showing Electrocardiography showing atrioventricular reentrant tachycardia with heart rate >233 bpm. Crystalloids bolus was given, and blood was transfused as considered to be in volume-depleted status. Blood pressure improved, but heart rate remained at 233 bpm. To rule out central line catheter-induced arrhythmia, catheter was pulled few centimeters out using C-arm guidance, but no change in heart rate being fixed at 233 bpm. A cardiologist opinion was taken and they diagnosed it as AVNRT and injection adenosine 6 mg intravenous bolus followed by 20 ml of saline flush was given through central line. Heart rate started to drop transiently up to 60bpm and later stabilized at preoperative basal heart rate of 132/mt with blood pressure of 128/80 mmHg.

## DISCUSSION

Women with underlying arrhythmias which are asymptomatic may only present to health-care professionals when they are pregnant. There are substantial changes in hormonal and hemodynamic states of pregnant women that may lead to arrhythmias.<sup>[3]</sup> Arrhythmias disturbing hemodynamic stability should be treated due to potential harm to fetus as a result of maternal hypotension. Most SVTs are benign and will respond to vagal stimulation or Valsalva maneuver.<sup>[4]</sup>

### Atrioventricular reentrant tachycardia

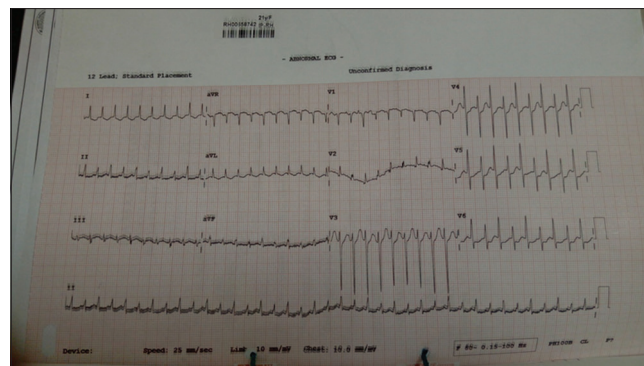
AV nodal reentrant tachycardia is the most common paroxysmal regular SVT. AV nodal reentrant tachycardia develops because of the presence of two electrophysiological distinct pathways for conduction in the complex syncytium of muscle fibers that make up the AV node. Although conduction occurs over both pathways during sinus rhythm, only the conduction over the fast pathway is manifest, and as a result, the PR interval is normal. Repetitive activation down the slow and up the fast pathway results in typical AV nodal reentrant tachycardia.<sup>[5]</sup>

### Electrocardiography findings in atrioventricular reentrant tachycardia

AVNRT is manifest typically as a narrow QRS complex tachycardia at rates that range from 120 to 250 bpm. The QRS-P wave pattern associated with typical AVNRT is quite characteristic, with simultaneous activation of the atria and ventricles from the reentrant AV nodal circuit.

The treatment options available for SVT (AVNRT) are pharmacological, nonpharmacological, electrocardioversion, and radiofrequency ablation. Nonpharmacological methods are Valsalva maneuver, carotid sinus massage, and facial ice immersion.<sup>[2]</sup> Pharmacological methods include important group of drugs, such as adenosine, verapamil, beta-blockers, amiodarone, and digoxin. There is good evidence that adenosine and verapamil are safe during pregnancy.

Adenosine is the first-line drug of choice for SVT (AVNRT) during the pregnancy period. Dose of adenosine is 6–12 mg,



**Figure 1:** Electrocardiography showing atrioventricular reentrant tachycardia with heart rate >233bpm

half-life is <10 s, and it is always given in central line along with flush.<sup>[6]</sup> Adenosine causes a transient heart block, causing a period of maternal asystole, and has been shown to successfully terminate some SVTs in pregnancy. In our case, we informed patient attenders regarding giving adenosine to terminate the present rhythm with its adverse effects explained. We prepared our self to tackle any untoward effects of adenosine by keeping emergency drugs such as adrenaline and charged defibrillator. Adenosine 6 mg was given through central line along with normal saline flush, heart responded by transient decrease in heart rate to 60/mt and reverted to 132/mt and stabilized. The patient had one more episode of AVNRT on the 7<sup>th</sup> postoperative day and was treated with adenosine in a similar manner.

Electrical cardioversion is considered safe in pregnancy as electrical cardioversion is reserved for more severe cases where medical treatment has failed and there is maternal compromise.<sup>[5]</sup> Radiofrequency ablation of arrhythmogenic substrate, which has rarely been performed during pregnancy, is an effective treatment of drug-refractory maternal SVT in advanced pregnancy.<sup>[6]</sup>

## CONCLUSION

The most important aspect in treating tachyarrhythmia's patients is the use of a multidisciplinary approach. The decision of what therapy to use must be addressed on a case-by-case basis with special attention to the patient's individual issues and concerns.

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### Conflicts of interest

There are no conflicts of interest.

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