

# Ischaemic Supraventricular Tachycardia: A Rare Case Report

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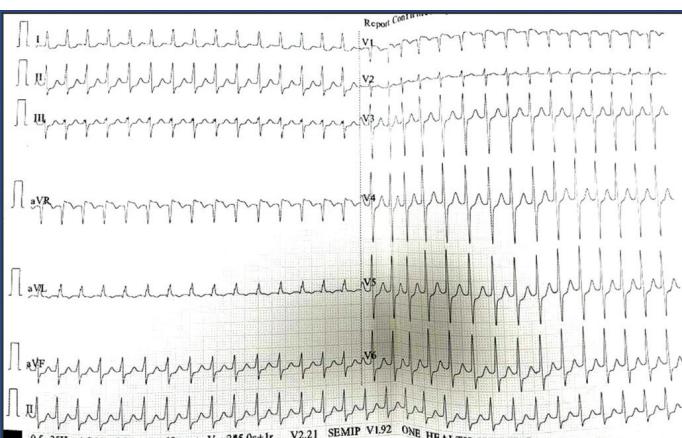
## ABSTRACT

The incidence of supraventricular arrhythmias other than Atrial Fibrillation (AF) and atrial flutter in postmyocardial Infarction (MI) patients is usually rare. The incidence of in-hospital AF after MI ranges from 5%-18%. Paroxysmal Supraventricular Tachycardia (PSVT) occurs in less than 10% of patients after an acute MI. Herein, the authors presented a case of a 47-year-old male presented to the Casualty Department with chief complaints of palpitations for the past six hours. The Electrocardiogram (ECG) revealed Supraventricular Tachycardia (SVT), and immediate pharmacological cardioversion was performed. Coronary Angiogram (CAG) was conducted, which revealed double vessel disease with critical lesions in the proximal Right Coronary Artery (RCA) and mid Left Circumflex (LCX). Percutaneous coronary intervention was performed for both lesions. The patient was discharged in a stable condition. Prompt and immediate diagnosis of arrhythmias is crucial, especially in patients with MI, to reduce mortality and morbidity.

**Keywords:** Arrhythmias, Coronary intervention, Myocardial infarction

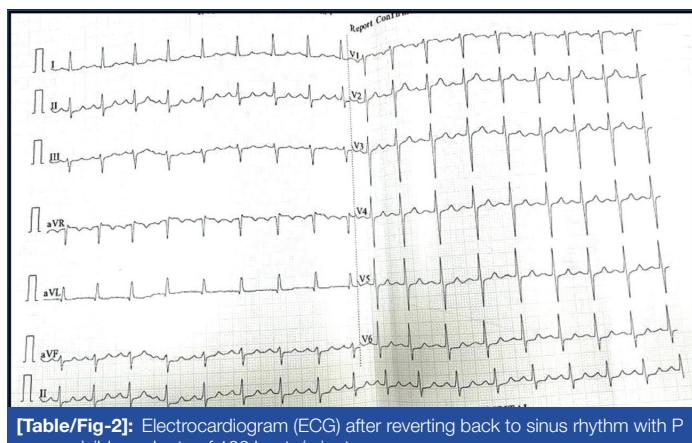
## CASE REPORT

A 47-year-old man presented to casualty with chief complaints of palpitations for the last six hours. The patient was a known case of hypertension and diabetes mellitus for more than five years. The patient did not have any significant cardiac history previously, and there were no other significant co-morbidities or similar complaints in the family. On examination, his blood pressure was 100/60 mmHg in the left brachial artery, and his heart rate was around 150-160 beats per minute. An ECG was immediately performed, which revealed SVT-Atrioventricular Nodal Re-entry Tachycardia (AVNRT) and reverted to sinus rhythm with adenosine 6 mg [Table/Fig-1,2]. A Two Dimensional (2D) Echocardiography (ECHO) showed a normal ejection fraction of 62% with no regional wall motion abnormality [Table/Fig-3].



**[Table/Fig-1]:** Electrocardiogram (ECG) on presentation– SVT (AVNRT)-Narrow QRS tachycardia with rate of 150 beats/minute, regular R-R interval with absence of P waves.

After stabilising the patient with necessary anti-arrhythmic drugs (adenosine and verapamil) and providing Intensive Care Unit (ICU) care, the patient underwent CAG due to persistent angina despite medication. The CAG revealed double vessel disease with significant critical stenosis. The junction of the mid and proximal RCA had a 95% lesion, and the mid LCX artery had an 80% lesion. [Table/Fig-4]. Mid LCX artery has 80% lesion [Table/Fig-5].



**[Table/Fig-2]:** Electrocardiogram (ECG) after reverting back to sinus rhythm with P waves visible and rate of 100 beats/minute.

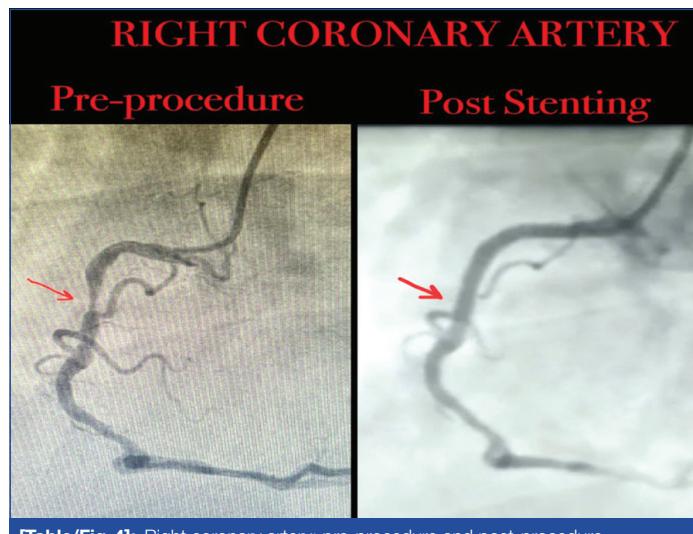


**[Table/Fig-3]:** A 2D ECHO parasternal long axis view.

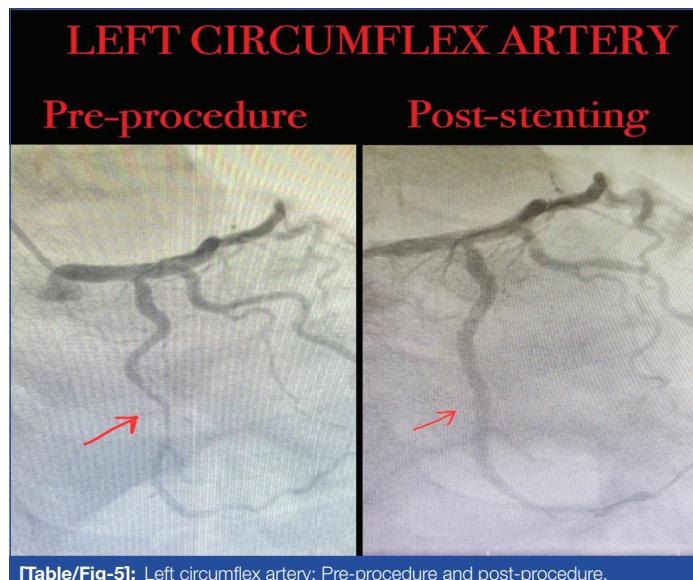
Percutaneous Transcatheter Coronary Angioplasty (PTCA) was performed on the RCA and LCX. The RCA lesion was treated with a promus premier stent of 3x24 mm, and the LCX lesion was treated with a promus premier stent of 2.50x8 mm. Both PTCA procedures to the RCA and LCX were successfully deployed, achieving Thrombolysis in Myocardial Infarction (TIMI) 3 flow. [Table/Fig-6].

PTCA to RCA (Promus premier 3×24 mm) and PTCA to LCX (2.5×28 mm) were successfully deployed with TIMI 3 flow achieved. No complications such as pericardial effusion, no flow or slow flow, coronary artery dissections, or coronary artery perforations were observed during the procedure.

Post PTCA, the patient was monitored in the ICU and treated with appropriate medications, including antiplatelets (ticagrelor and aspirin), antianginals (trimetazidine and nitrates), statins (atorvastatin), and beta-blockers (metoprolol). The patient was discharged in a haemodynamically stable condition and advised to follow-up in the Cardiology Outpatient Department (OPD) after two weeks. The patient was also advised not to stop antiplatelets without doctor's advice.



[Table/Fig-4]: Right coronary artery: pre-procedure and post-procedure.



[Table/Fig-5]: Left circumflex artery: Pre-procedure and post-procedure.

Parameters	RCA	LCX
Guide catheter	6F EBU 3.0	6F XB 3.0
Guide wire	Whisper MS 0.014×190 cm	Whisper MS 0.014×190 cm
Pre-dilatation	NC Trek 2.75×12 mm @ 14 atm×20 sec	Trek 2.5×8 mm @ 12 atm×20 sec
Stent	Promus premier (Mid) 3×24 mm @ 14 atm×20 sec	Promus premier (Mid) 2.50×28 mm @ 8 atm×20 sec
Post-dilatation	NC Quantum Apex 3.5×15 mm @ 14 atm×20 sec	NC Trek 2.75×12 mm @ 14 atm×20 sec

[Table/Fig-6]: Percutaneous Transcatheter Coronary Angioplasty (PTCA) procedure. RCA: Right coronary artery; LCA: Left circumflex; EBU: Extra-backup

## DISCUSSION

Post-ischaemic SVT is a rare presentation, with AF being the most common atrial arrhythmia encountered. In the present case report, SVT with AVNRT was observed, which is a rare entity in post-ischaemic conditions. Apart from AF and atrial flutter, supraventricular arrhythmias are usually rare during the periinfarction period [1]. The occurrence of SVT usually indicates the presence of myocardial dysfunction. It tends to exacerbate ongoing myocardial ischaemia or can cause heart failure [1].

The incidence of PSVT after MI is less than 10%. However, due to the fast ventricular rate, early and aggressive management is required for such patients [2]. The incidence of atrial tachyarrhythmias varies from 6%-20% in the acute MI setting. These atrial tachyarrhythmias mostly occur within 72 hours after the infarction. Among the atrial tachyarrhythmias, AF and atrial flutter are common [3]. The mechanism of atrial tachyarrhythmias following MI is usually attributed to atrial dysfunction due to atrial ischaemia, increased left atrial pressures, and sympathetic stimulation [4].

The SVT holds important prognostic significance in acute MI [5]. This is because arrhythmias complicate acute MI mostly in patients with severe myocardial dysfunction. The elevated heart rate increases myocardial oxygen demand and diastolic dysfunction, leading to worsening myocardial ischaemia and poor left ventricular output [6]. Patients with persistent tachycardia following MI usually have larger infarcts and more anterior involvement with impairment in LV function [7]. Assessing Left Atrial (LA) reservoir strain and PA-TDI on ECHO after initial CHA2DS2-VASc scoring provides additional risk stratification for stroke and may be useful in guiding decisions regarding anticoagulation for patients upon the first diagnosis of AF [8].

In the index case, a 47-year-old gentleman presented with palpitations, and the ECG revealed SVT with AVNRT. Immediate cardioversion with Inj. adenosine 6 mg was given, which reverted the rhythm to sinus. However, post-sinus rhythm, the patient complained of chest pain and anginal symptoms. In view of persistent angina, CAG was performed, revealing significant lesions in the RCA and LCX. PTCA was performed, and the patient was monitored postoperatively in the cardiac ICU. The patient was discharged in a hemodynamically stable condition and advised to follow-up after two weeks in the cardiology OPD.

## CONCLUSION(S)

In general, arrhythmias in acute MI are known to increase mortality. Therefore, it is necessary to promptly and accurately diagnose and treat arrhythmias in MI. Medical therapy is effective and safe for suppressing these arrhythmias.

## REFERENCES

- Koca H, Demirtas AO, Kaynakli O, Icen YK, Sahin DY, Koca F, et al. Decreased left atrial global longitudinal strain predicts the risk of atrial fibrillation recurrence after cryoablation in paroxysmal atrial fibrillation. *J Interv Card Electrophysiol*. 2020;58(1):51-59. doi: 10.1007/s10840-019-00573-4.
- Voigt JU, Mălăescu GG, Haugaa K, Badano L. How to do LA strain. *Eur Heart J Cardiovasc Imaging*. 2020;21(7):715-17. doi: 10.1093/eihci/jea091.
- Walker A, Olsson E, Wranne B, Ringqvist I, Ask P. Time delays in ultrasound systems can result in fallacious measurements. *Ultrasound Med Biol*. 2002;28(2):259-63. doi: 10.1016/S0301-5629(01)00503-8.
- Toman O, Hnatkova K, Smetana P, Huster KM, Šíšáková M, Barthel P, et al. Physiologic heart rate dependency of the PQ interval and its sex differences. *Sci Rep*. 2020;10:2551. doi: 10.1038/s41598-020-59480-8.
- Dobrev D, Aguilar M, Heijman J, Guichard JB, Nattel S. Postoperative atrial fibrillation: Mechanisms, manifestations and management. *Nat Rev Cardiol*. 2019;16(7):417-36. doi: 10.1038/s41569-019-0166-5.
- Kuck KH, Brugada J, Fürnkranz A, Metzner A, Ouyang F, Chun KR, et al. Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. *N Engl J Med*. 2016;374(23):2235-45. doi: 10.1056/NEJMoa1602014.

[7] Berrezzo A, Tamborero D, Mont L, Benito B, Tolosana JM, Sitges M, et al. Pre-procedural predictors of atrial fibrillation recurrence after circumferential pulmonary vein ablation. *Eur Heart J.* 2007;28(7):836-41. doi: 10.1093/eurheartj/ehm027.

[8] Leung M, van Rosendael PJ, Abou R, Marsan NA, Leung DY, Delgado V, et al. Left atrial function to identify patients with atrial fibrillation at high risk of stroke: New insights from a large registry. *Eur Heart J.* 2018;39(16):1416-25. doi: 10.1093/eurheartj/ehx736.

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