

MONNO MEDICAL COLLEGE & HOSPITAL

CME ON

A case presentation on Supraventricular Tachycardia

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Date: 20/01/2025. Time: 08am-09am

Venue: Gallery-04, 4th Floor

**Organized by: Medical Education Unit (MEU)
Monno Medical College, Manikganj**



You Are Cordially Invited

A CASE PRESENTATION ON SUPRAVENTRICULAR TACHYCARDIA (SVT)

Presented By,

The Department Of Cardiology

Monno Medical College & Hospital

OUTLINE

- ✓ **THE CASE**
- ✓ **WHAT IS SVT?**
- ✓ **EPIDEMIOLOGY**
- ✓ **AETIOLOGY**
- ✓ **PATHOGENESIS**
- ✓ **SYMPTOMS**
- ✓ **INVESTIGATIONS**
- ✓ **TREATMENT**

THE CASE

Mrs. Mariya Akter, 28 years old normotensive & nondiabetic, married female patient came to our hospital with the complaints of sudden palpitation and chest tightness for approximately two hours prior admission. She also complaints of shortness of breath for same duration.

According to the statement of the patient, she was reasonably well 2 hours back, then suddenly she developed severe palpitation with chest tightness. As her symptoms became worsen like constant palpitation and chest tightness with shortness of breath which were increased over time and not relived by taking rest, she rushed to A&E department of MoMCH.

After taking a 12 lead ECG and Urgent consultation with MO of CCU she was admitted to CCU of Monno Medical College & Hospital for better management.

VITAL SIGNS ON ADMISSION

Normal Range of vitals:

Heart Rate	BP	O2 saturation	Resp. Rate	Temperature
60-100 b/min	120/80 mm of Hg	95-100%	12-20 breath/min	97-98 ⁰ F

Patient vitals:

Heart Rate	BP	O2 saturation	Resp. Rate	Temperature
240 b/min	(110/90) mm of Hg	96%	28 breath/min	98.4 ⁰ F

ON ADMISSION ECG OF MRS. MARIYA AKTER

**ECG shows,
Absence of P wave.
Narrow QRS complex.
Rhythm is regular.
Heart rate >200b/min.**



❖ **Provisional Diagnosis:**

Supraventricular Tachycardia (SVT)

❖ **Differential Diagnosis:**

1. Ventricular Tachycardia
2. Ventricular Fibrillation
3. Atrial Fibrillation
4. Atrial Flutter

ECG OF DIFFERENT ARRHYTHMIAS

Atrial Fibrillation



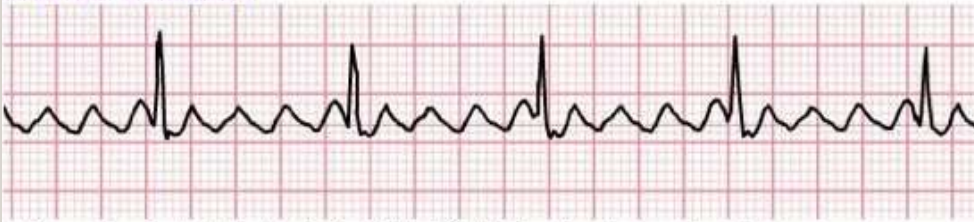
- **No P waves**
- Irregularly **irregular**
- **Uncoordinated** atrial activity
- Most common **sustained dysrhythmia**
- **Variable** ventricular response rate

Ventricular Fibrillation



- Completely **disorganized**
- Immediate cessation of cardiac output, **no associated pulse**
- No discernible P waves, QRS complexes, or T waves
- **Incompatible** with life

Atrial Flutter



- **Organized** electrical activity (Atrial fibrillation is *disorganized*)
- **Atrial rate** ranges from 250-300 beats per minute
- AV node conducts every **2 or 3 atrial impulses**
- Ventricular rate is classically **150 (2:1 conduction)**
- Characteristic "**saw-tooth**" pattern

Ventricular Tachycardia



- **AV dissociation**
- QRS >120 msec (**wide complex**)
- **Rate >100** (typically 150-200)
- **Fusion** beats
- **Capture** beats

DIAGNOSIS:

After analyzing the 12 lead ECG & symptoms of our patient we finalize our diagnosis that, Mrs. Mariya Akter was a patient of **SUPRAVENTRICULAR TACHYCARDIA (SVT)**

MANAGEMENT GIVEN AFTER ADMISSION


After arriving to CCU we have done quick initial assessment and

- Ensured airway and breathing by giving Oxygen in propped up position.
- We ensured I/V access for giving emergency medications.
- Patient is reassured & counselled about her condition.
- Then we have given following medical management.

1.PHYSIOLOGICAL:

- Carotid Sinus Massage. **(did not responded)**
- Valsalva Maneuver. **(did not responded)**

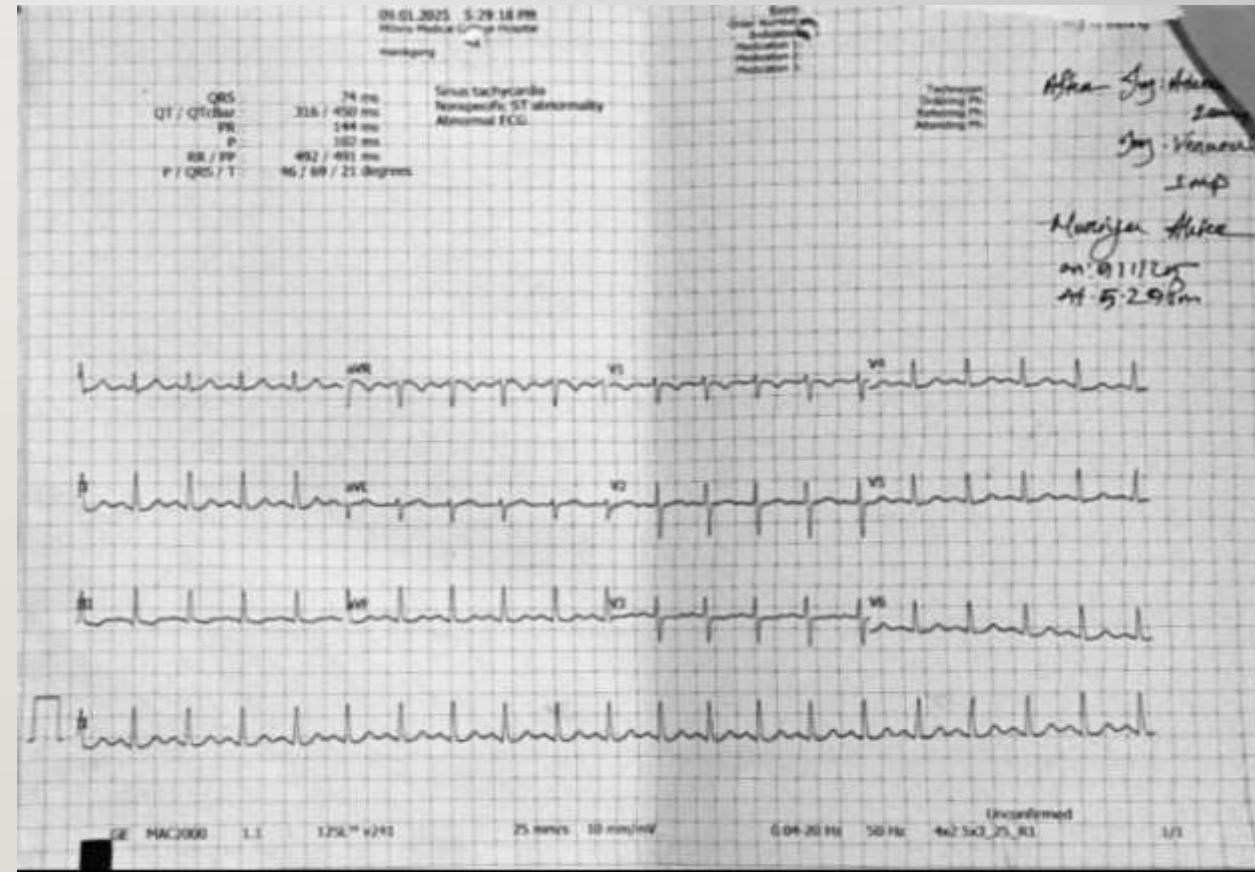
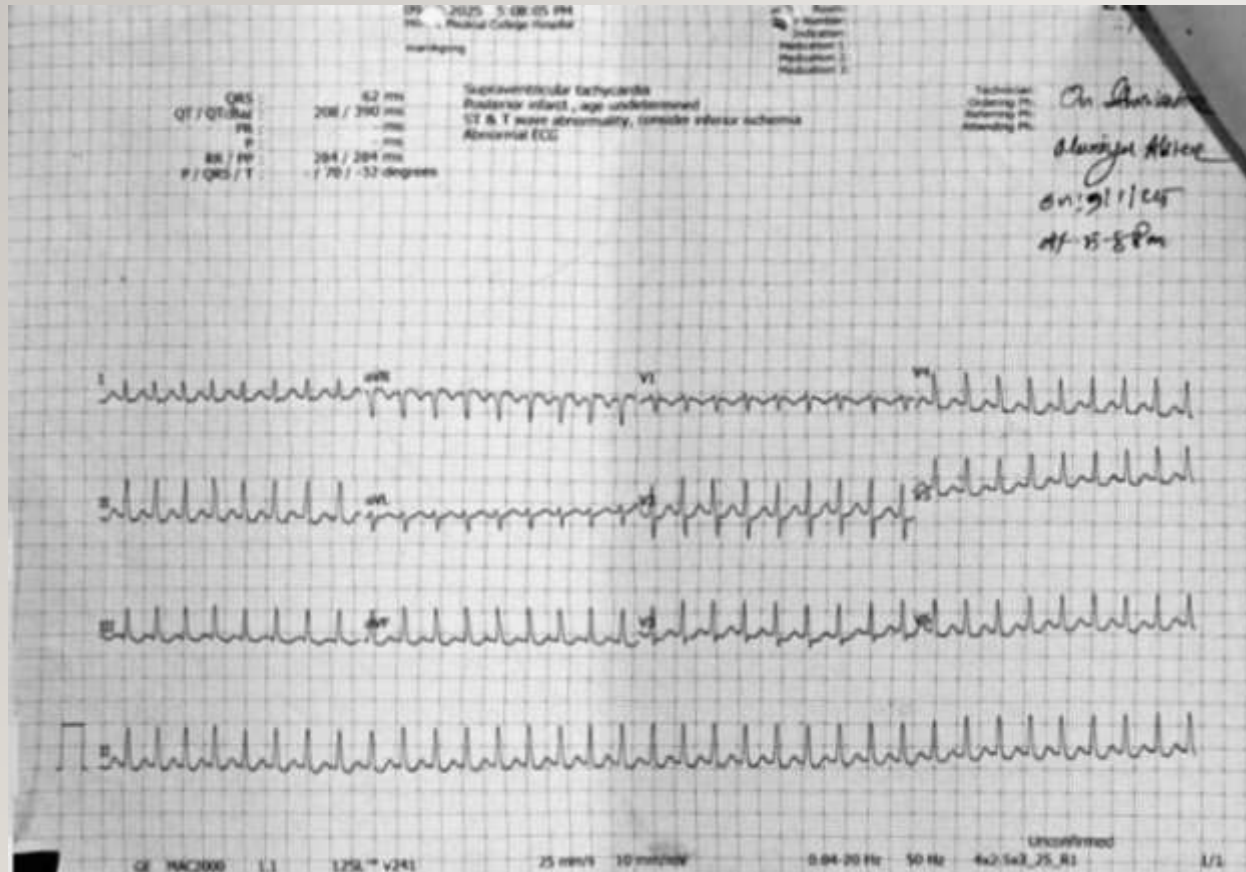
2.PHARMACOLOGICAL :

- **Inj. ADENOSINE 6mg** given I/V repeated 2 times 10 minutes interval but there was no response.
 - **Inj. VERAPAMIL 5mg I/V over 5 min & her Arrhythmia reverted to sinus.**
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BEFORE INJ. VERAPAMIL



AFTER INJ. VERAPAMIL



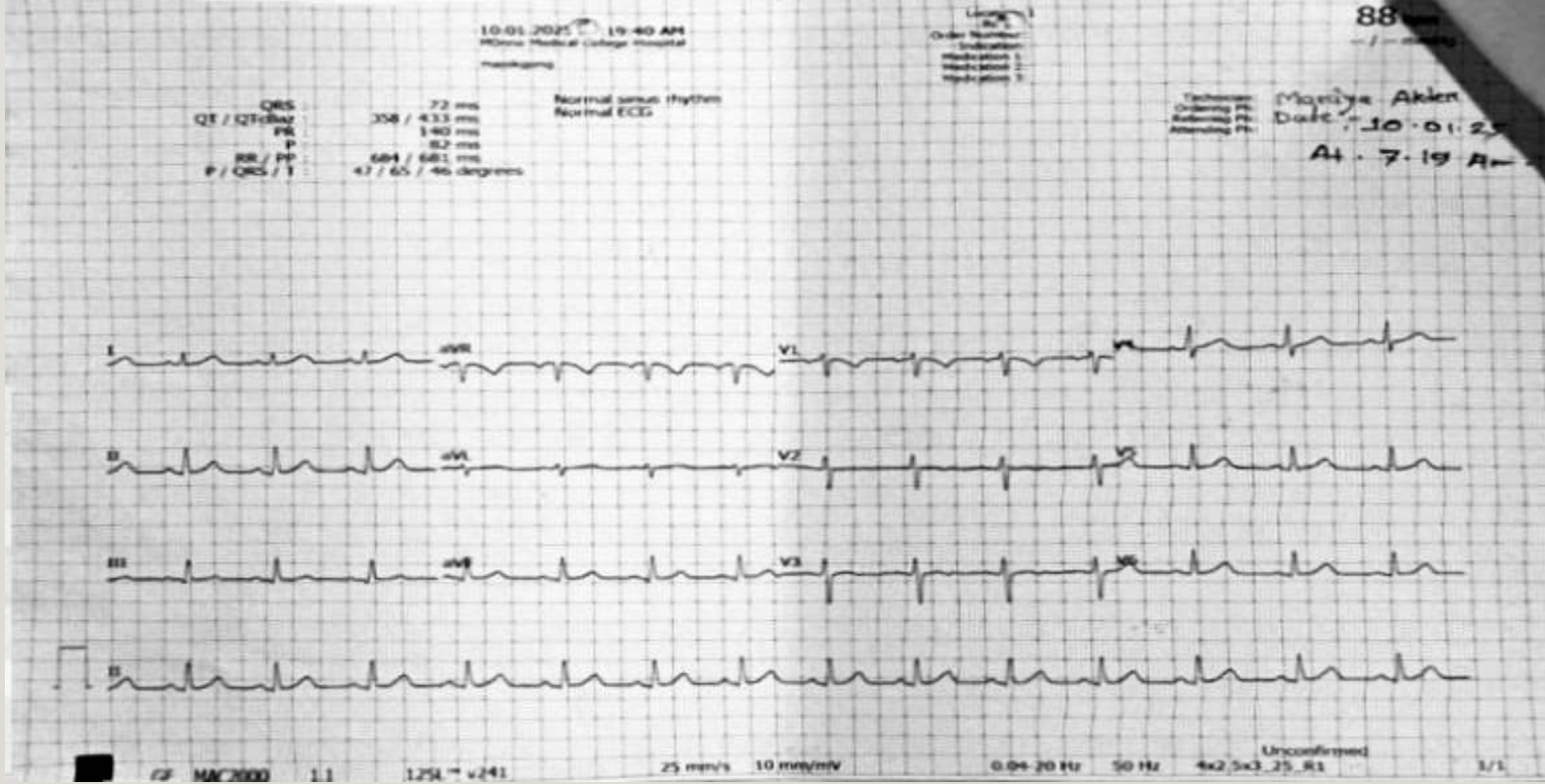
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- Patient was assessed every 30 minutes interval for 12 hours then 2 hourly for 48 hrs.
 - Blood sample was sent for routine laboratory investigation & Reports were collected urgently.
 - Her lab reports are given below.

Complete Blood Count	Hb%	ESR	WBC	Neutrophil
	12.8g/dl	15mm/hr.	$14.6 \times 10^3 / \mu\text{l}$	66%

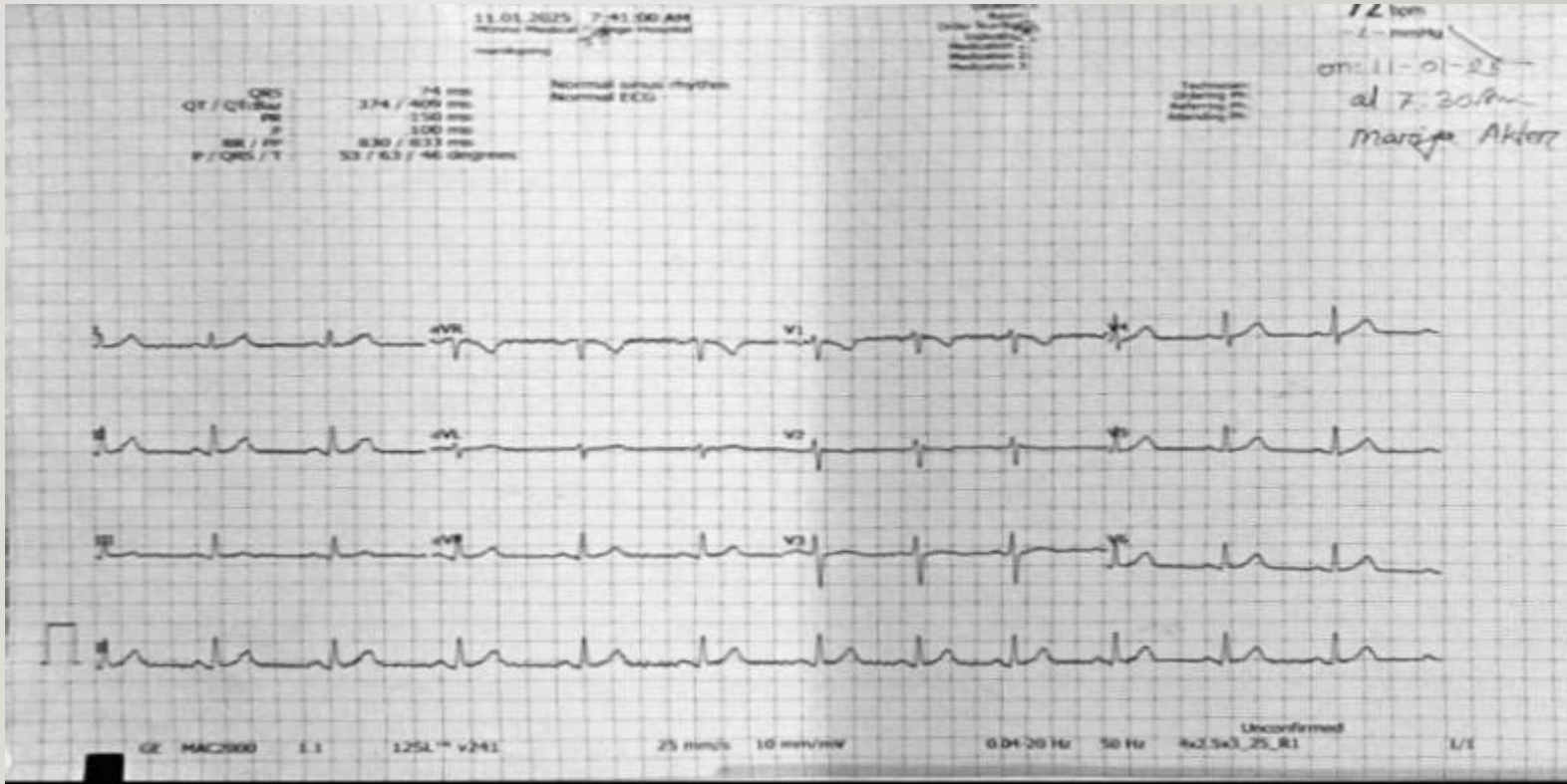
Serum Electrolytes	Na+	K+	Cl-
	147.2 mmol/l	4.0 mmol/l	108.0mmol/l

Troponin- I: 17.9 ng/l
FT4: 12.45 pmol/l
TSH: 4.77 $\mu\text{IU/ml}$
Echocardiography: LVEF-62%

ECG (DAY-01) AFTER ADMISSION IN CCU

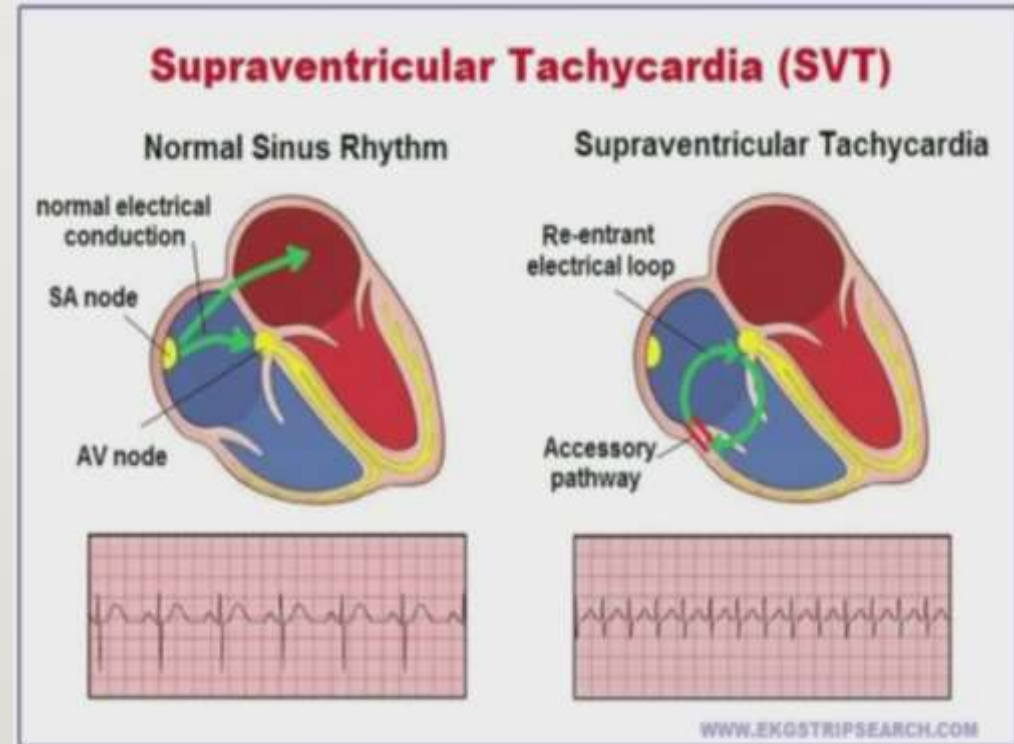


ECG (DAY-02) AFTER ADMISSION IN CCU



WHAT IS SVT?

- Supraventricular tachycardia is a dysrhythmia originating at or above the atrioventricular (AV) node and is defined by a narrow complex (QRS < 120 milliseconds) at a rate > 100 beats per minute (bpm). It can occur as episodes that start and stop suddenly.



EPIDEMIOLOGY

Prevalence:

- SVT affects approximately 2-3 people per 1,000 in the general population. It is more common in females compared to males, with a female-to-male ratio of approximately 2:1.
- Prevalence increases with age, with most cases diagnosed in adults aged 25 to 50 years. However, certain forms, like Wolff-Parkinson-White (WPW) syndrome, may be identified earlier.

EPIDEMIOLOGY

Incidence:

- The annual incidence of SVT is about 35 cases per 100,000 individuals.
- AV nodal reentrant tachycardia (AVNRT) is the most common type of SVT, accounting for 60-70% of cases.
- Atrioventricular reciprocating tachycardia (AVRT) associated with WPW syndrome is seen more in younger patients.

AETIOLOGY

Some common causes of SVT include:

- **Lifestyle habits**: Stress, Anxiety, Smoking, Drinking too much Alcohol or Caffeine, and using Recreational Drugs.
- **Medications**: Some medications, including Nasal Decongestants with Pseudoephedrine.
- **Other health conditions**: Congenital Heart Disease, Lung Problems, Heart Attack, Mitral Valve Disease, Thyroid Disease, or Diabetes.
- **Infections**: Respiratory Syncytial Virus (RSV) Infection in Infancy can cause SVT.

PATHOPHYSIOLOGY

- **Initiating Event**
- **Mechanisms of SVT**
- **Sites of Origin**
- **Effects on Cardiac Function**
- **Resolution or Persistence**

PATHOPHYSIOLOGY

Initiating:

- Abnormal electrical activity originates above the ventricles (atrium or AV node)

Premature atrial or ventricular contraction triggered automaticity or reentry mechanism.

PATHOPHYSIOLOGY

Mechanisms of SVT:

- **Reentrant Circuits (Most Common)**
- **AV Nodal Reentrant Tachycardia (AVNRT)**
- **AV Reentrant Tachycardia (AVRT) (e.g., Wolff- Parkinson-White Syndrome).**
- **Triggered Activity.**
- **Enhanced Automaticity.**

PATHOPHYSIOLOGY

Sites of Origin:

- Atria : Atrial Tachycardia or Flutter.
- AV Node : AVNRT.
- Accessory Pathway : AVRT (Orthodromic or Antidromic)

PATHOPHYSIOLOGY

Effects on Cardiac Function: Rapid Ventricular Response causes,

- Reduced cardiac output due to insufficient ventricular filling.
- Increased myocardial oxygen demand.
- Potential for hemodynamic instability (especially in prolonged episodes).

PATHOPHYSIOLOGY

Resolution or Persistence:

- **Spontaneous Termination**(common in paroxysmal SVT).
- **Persistent Tachycardia** -leading to medical intervention (e.g., Vagal Maneuvers, Pharmacotherapy, or Catheter Ablation).

SYMPTOMS

- **Rapid Heartbeat**
- **Palpitations**
- **Shortness of Breath**
- **Dizziness**
- **Chest Pain or Discomfort**

INVESTIGATIONS

- **Electrocardiogram(ECG)**
- **Echocardiogram**
- **Chest X-ray**
- **Blood Test**
- **Holter Monitoring**
- **Electrophysiological Study (EPS)**

TREATMENT (ACUTE MANAGEMENT)

1. Rest and Reassurance.
2. Mechanical or physiological method such as **CAROTID SINUS MASSAGE** or **VALSALVA MANEUVER**.
3. Intravenous **ADENOSINE** 6 mg over 2 second. If no response repeat 2-3 times.
4. Intravenous **VERAPAMIL** 5 mg slowly over 5 to 10 min.
5. **VERAPAMIL** injection should be avoided in patients with **QRS complex >120 MS** or **WPW SYNDROME** or Patient having **beta blockers**.
6. **Synchronized DC CARDIOVERSION**.

TREATMENT (PROPHYLACTIC MANAGEMENT)

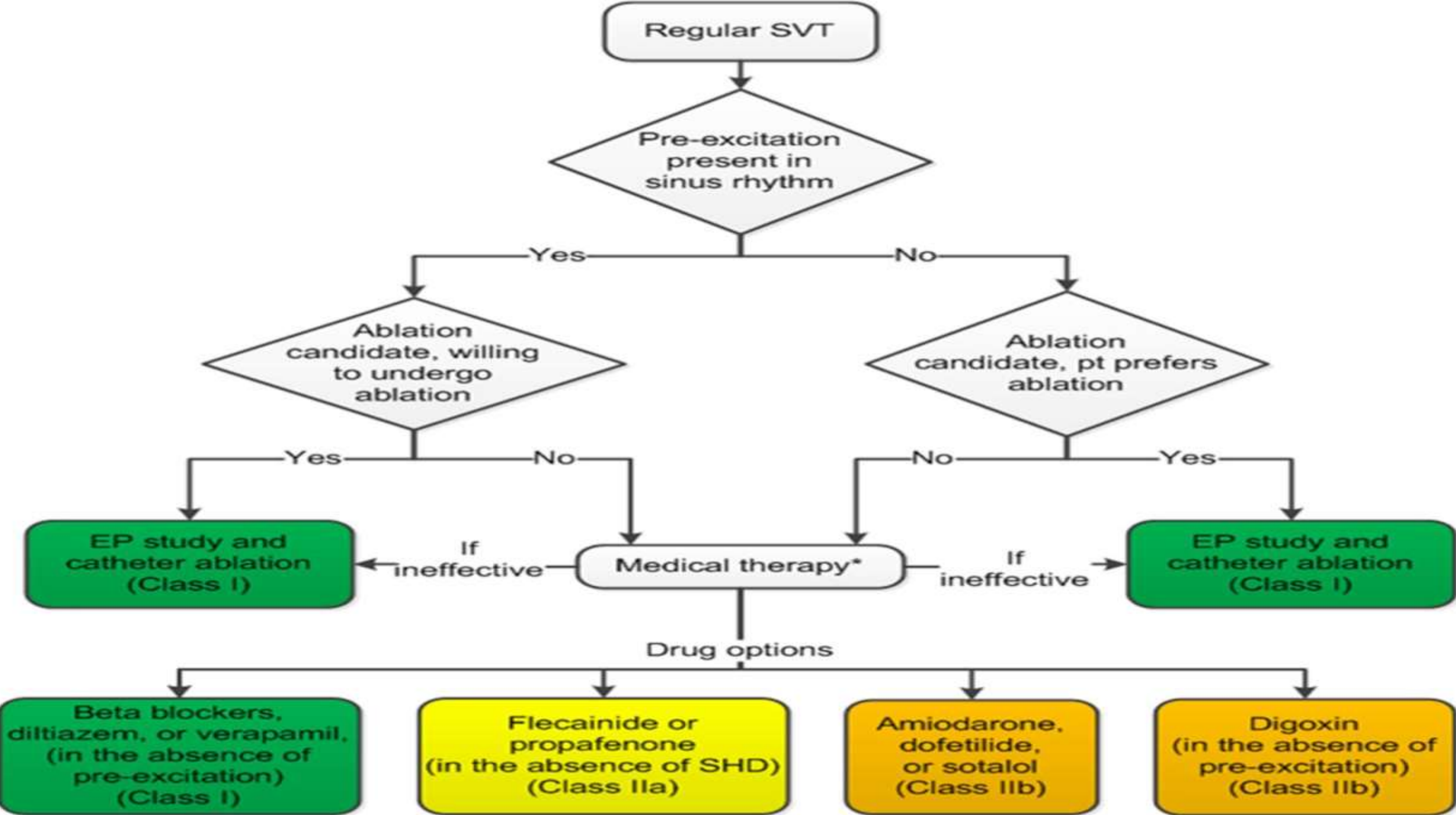
1. Oral Pharmacological therapy with **beta blocker, Verapamil, Flecainide.**
2. If Pharmacological Management fails, **ELECTROPHYSIOLOGICAL STUDY (EPS)** followed by **RADIO-FREQUENCY ABLATION (RFA)** may be done.
3. In **WPW SYNDROME, ELECTROPHYSIOLOGICAL STUDY (EPS)** followed by **RADIO-FREQUENCY ABLATION (RFA)** is the treatment of choice.

TREATMENT: (RECOMMENDATIONS IN ECS GUIDELINES, 2024)

- Vagal maneuvers are recommended for acute treatment in patients with regular SVT.
- Adenosine is recommended for acute treatment in patients with regular SVT.
- Synchronized cardioversion is recommended for acute treatment in patients with hemodynamically unstable SVT when vagal maneuvers or adenosine are ineffective or not feasible.
- Synchronized cardioversion is recommended for acute treatment in patients with hemodynamically stable SVT when pharmacological therapy is ineffective or contraindicated.

TREATMENT: (RECOMMENDATIONS IN ECS GUIDELINES, 2024)

- Intravenous diltiazem or verapamil can be effective for acute treatment in patients with hemodynamically stable SVT.
- Intravenous beta blockers are reasonable for acute treatment in patients with hemodynamically stable SVT.



SOME CRITICAL PATIENT MANAGEMENT MOMENTS IN CCU



SOME CRITICAL PATIENT MANAGEMENT MOMENTS IN CCU



SOME CRITICAL PATIENT MANAGEMENT MOMENTS IN CCU





THANK

YOU

Feel free to ask any Question