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CASE REPORT: VENTRICULAR TACHYCARDIA (VT) STORM IN A PATIENT WITH ATRIAL SEPTAL DEFECT (ASD)

Cardiology

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ABSTRACT

Ventricular Tachycardia (VT) storm is a life-threatening condition characterized by multiple episodes of sustained VT within a short duration. It is rare in the context of congenital heart disease like Atrial Septal Defect (ASD). Here, we present a case of VT storm in a 45-year-old female with a diagnosed uncorrected ASD.

KEYWORDS

INTRODUCTION:

Atrial Septal Defect (ASD) is a congenital cardiac anomaly that often presents with asymptomatic left-to-right shunting or mild symptoms like fatigue. VT storm, defined as three or more episodes of VT within 24 hours, is uncommon in ASD. However, chronic volume overload and right ventricular dilation can predispose to arrhythmias. This case underscores the importance of evaluating unexplained arrhythmias for underlying structural heart disease.

CASE PRESENTATION:

45 years female presented with recurrent presyncopal attcaks,dyspnea on exertion since 1 month which aggrevated in the last 3 days from the day of presentation. No known medical conditions; occasional fatigue during exercise.

Family History, Unremarkable for sudden cardiac death or congenital anomalies.

On arrival the initial ecg had high degree av block which converted into monomorphic vt storm spontaneously(bradycardia induced vt)

Initial Evaluation

Vital signs: BP: 90/60 mmHg, HR: 180 bpm (VT), RR: 22/min, SpO_2: 94% on room air.

Physical examination: Elevated jugular venous pressure, a systolic murmur at the left upper sternal border, no peripheral edema.

Diagnostic Workup
1. Electrocardiogram (ECG): Wide complex tachycardia (VT) lv origin superior axis. Initial post cardioversion showed incomplete right bundle branch block and right-axis deviation,with crochetage sign.but patient had multiple vt episodes.patients subsequent ecg showed av dissociation with marching of p waves.
2. Laboratory tests:
Normal electrolytes, renal function, and thyroid profile.
3. Echocardiography:
Dilated right atrium and right ventricle.
Left-to-right shunting across a 1.8 cm secundum ASD.
Normal left ventricular function (LVEF 60%)
CAG:normal epicardial arteries

Management

1. Acute Phase:
VT Storm:

Immediate cardioversion for sustained VT.

Intravenous amiodarone infusion initiated (loading dose: 150 mg over 10 minutes, followed by 1 mg/min infusion.almost loaded with 2100mg of amiodarone.

Addressed potential triggers: Normalized potassium (4.5 mmol/L) and magnesium (2.2 mg/dL).

Sedation with midazolam for recurrent episodes.

2. Antiarrhythmic Maintenance:
Oral beta-blocker (metoprolol succinate 25 mg daily).
Amiodarone not transitioned to oral therapy in view of prolonged Qtc

Outcome and Follow-Up
The patient was discharged in stable condition after 10 days and referred for EPS

DISCUSSION:

The chronic left-to-right shunt associated with ASDs leads to increased hemodynamic load and geometric remodeling. This chronic volume stress leads, in turn, to electrical remodeling that may precipitate development of arrhythmias. Atrial myocyte electrophysiologic properties are altered, with increased intra-atrial conduction time a common finding, likely from combination of interstitial fibrosis and chamber enlargement . Sinus node conduction properties may also be as altered. Different types of ASDs may also have specific impact on the sinus node and/or AV node depending on embryologic origin and anatomic proximity as noted prior.

VT storm in ASD is rare but potentially fatal. Chronic volume overload in ASD leads to right ventricular strain, dilation, and arrhythmogenic substrate development. ASD closure alleviates hemodynamic stress, but pre-existing electrical remodeling necessitates long-term arrhythmia management. ICD placement remains crucial in secondary prevention.

Key Points

1. VT in adults should prompt evaluation for underlying congenital heart defects.
2. Timely ASD closure can prevent long-term complications.
3. A multidisciplinary approach combining interventional, electrophysiological, and pharmacological strategies is essential in VT storm management.

CONCLUSION:

This case highlights the interplay between congenital heart defects and arrhythmogenesis, emphasizing the importance of early detection and comprehensive management to prevent adverse outcomes.

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