



# HEALTHY HEART

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Honorary Editor :

**Dr. Shaunak Shah**

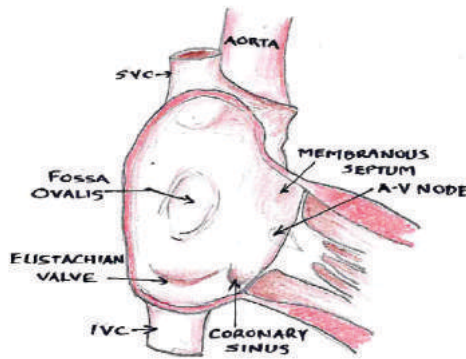
Paediatric &  
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Sinus Venous Atrial Septal Defect (SVASD) is often undetected and we see a number of these patients, even in adulthood. Proper evaluation & correct management leads to near normal life for most patients. In this issue, we discuss SVASD & Its management at all age groups. I thank Dr. Niren Bhavsar for Excellent illustrations.



## Sinus Venous Atrial Septal Defect (SVASD)



*Fig-1 Normal Heart Internal*

### NORMAL INTER ATRIAL SEPTUM

An atrial septal defect is a hole of variable size in the atrial septum.

Partial Anomalous Pulmonary Venous Connection (PAPVC) is a condition in which some, but not all pulmonary veins connect to the right atrium or its tributaries rather than to the left atrium.

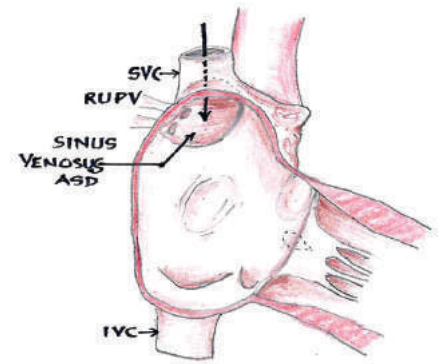
The most common type of PAPVC is the defect present in which PAPVC coexists with a superior caval ASD : "Sinus Venous ASD". The ASD in sinus venous syndrome is located immediately beneath the orifice

of SVC. This results in right superior pulmonary and sometimes the middle lobe veins opening in to SVC or SVC- Right Atrial junction. (Fig. 2)

The lower margin of the defect is sharply defined edge of atrial septum but upper margin is devoid of septum.

Rarely, three or four right pulmonary veins open into SVC, the uppermost entering SVC, near azygos vein entry.

The lowermost part of the SVC that receives the anomalous veins is normally wider . However, if well formed LSVC is there, it may be small.



*Fig-2 SVC Type Sinus Venous ASD*

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**Left to Right Shunts**

1. Partial Anomalous Pulmonary Venus Correction
2. Atrial Septal Defect
3. Atrioventricular Septal Defect (AVSD)
4. Ventricular Septal Defect
5. Patent Ductus Arteriosus
6. Systemic Arterial Venous Fistula

**Types of ASD**

1. Secundum ASD
2. Superior Sinus Venosus ASD
3. Inferior Sinus Venosus-ASD
4. Coronary Sinus ASD
5. Primum ASD

**Clinical Features & Investigation:**

Shunts at atrial level are low pressure. This will involve the passage of excess blood through the whole of right atrium & ventricle, This will be reflected on the EKG, CXR & Echocardiogram.

Significant pulmonary hypertension is uncommon but prolonged right atrial loading pre-disposes to atrial arrhythmia & may result in right ventricular failure.

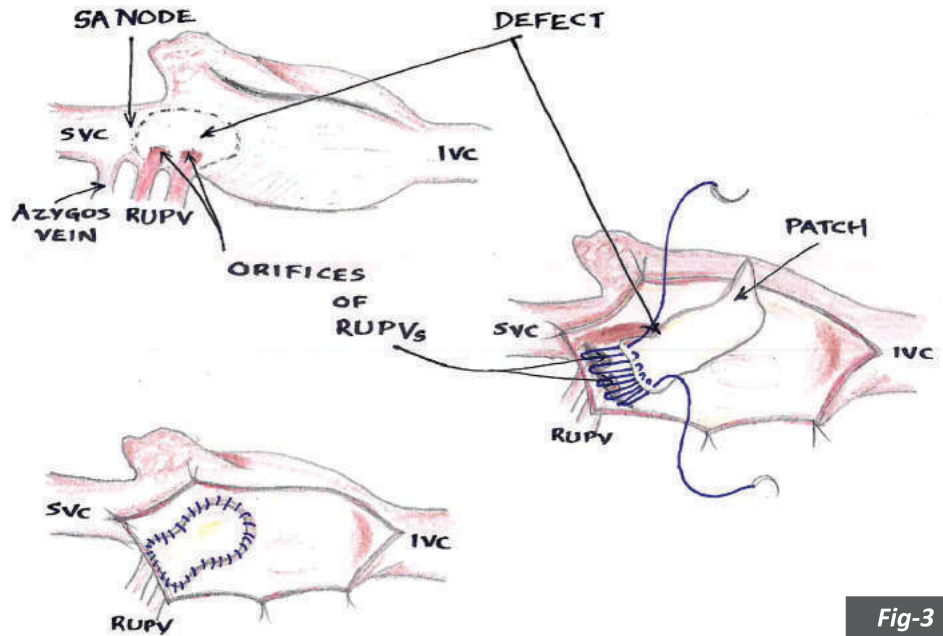
A CT Scan may sometimes be necessary to exactly delineate anomalous pulmonary veins opening in to superior vena cava, at higher than usual location.

This may aid in planning the surgery.

**Timing of Surgery:**

Surgery is the treatment of choice as these defect are not deviceable.

The ideal time for surgery is preschool age: around 2 to 4 years, however if the shunt is large, child develops pulmonary hypertension or has failure to thrive or recurrent respiratory tract infection, earlier surgery is indicated.



**Fig-3**

Often sinus venous ASD remains asymptomatic and is detected in elderly on routine / unrelated investigation. We have operated on number of patients in their late 40s, & 50s, the eldest patient being a 61 year old woman.

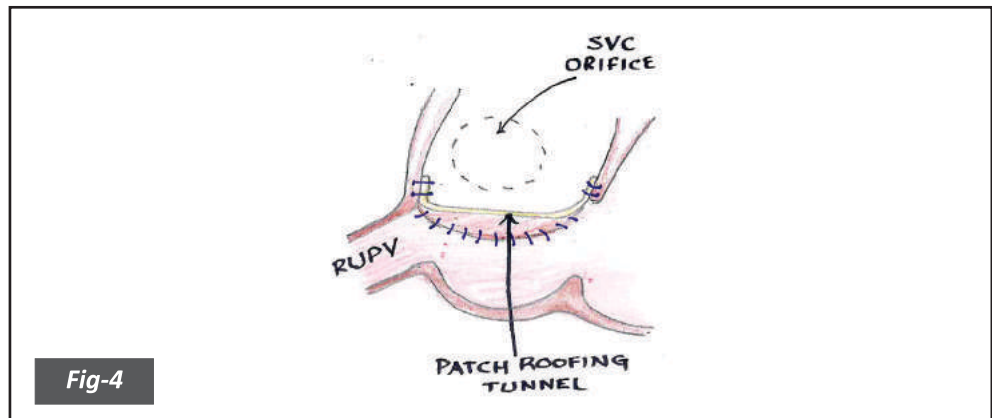
Through a midline sternotomy, & under cardiopulmonary bypass, the sinus venous ASD is closed using autologous pericardial patch. The SVC-RA junction is enlarged with another similar patch so that there is no obstruction to SVC- RA flow. (Fig. 3 & 4)

**Surgery For SV ASD**

The aims of corrective surgery in Sinus venosus ASD are:

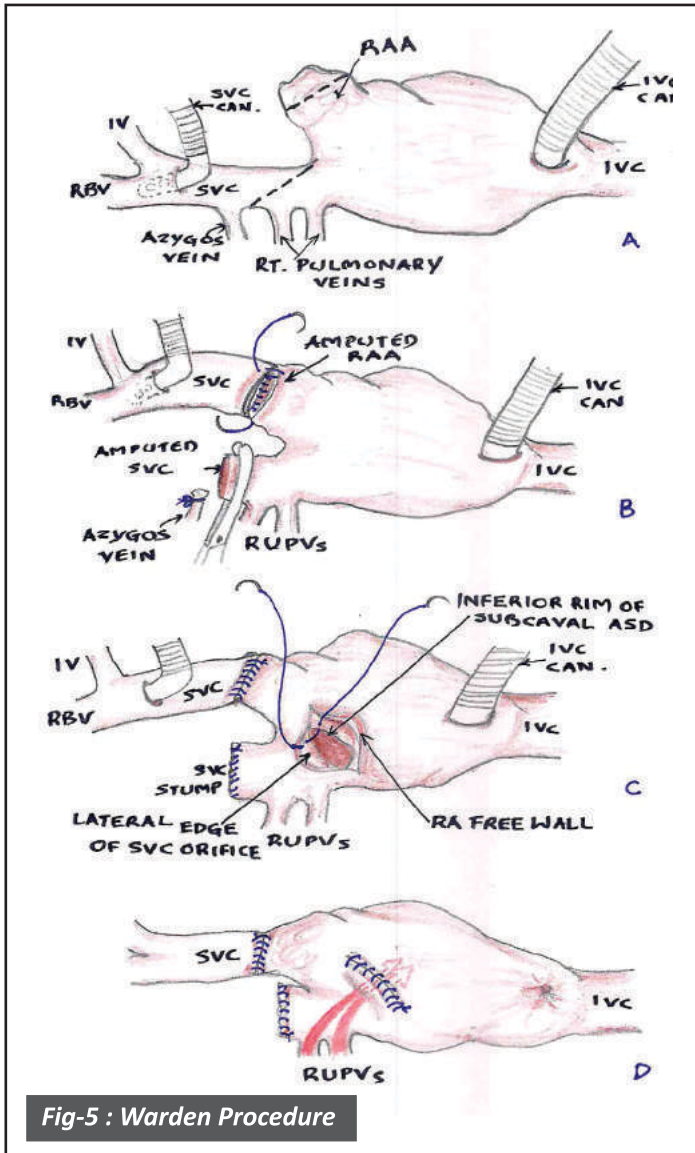
1. Elimination of L->R Shunt
2. Unobstructed SVC to RA flow
3. Unobstructed Pulmonary venous return to LA
4. Normal sinus rhythm.

In patients in whom the highest pulmonary vein opens 2 cm above SVC-RA junction, a Warden's procedure or a modification of Warden procedure using e-PTFE tube is used. (Fig. 5 & 6)

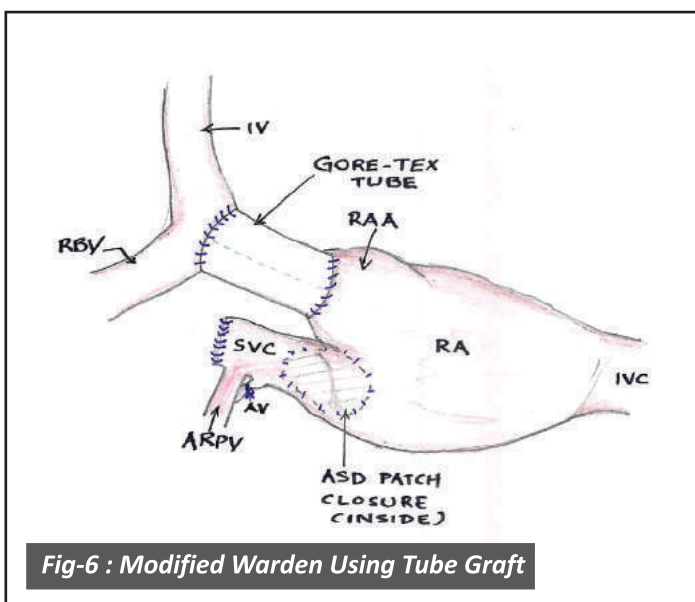


**Fig-4**





**Fig-5 : Warden Procedure**



**Fig-6 : Modified Warden Using Tube Graft**

**Result:**

At MCIMS Hospital , 306

ASDs have been operated. Sinus Venosus ASD was present in 66 Out of this, 42 patients underwent Warden’s / modified Warden’s procedure using a Gore tex tube.

There was no hospital mortality. All patient’s underwent intra op trans esophageal Echo/ Epicardial Echo. A gradient of more than 4 mm between SVC & RA was not accepted & it was addressed on the table.

All patients had pre-discharge echoes, Patients with modified Warden’s procedure were given oral anticoagulants for the first 3 months & later aspirin lifelong. Children with Warden’s did not require aspirin after 6 weeks.

**Summary:**

Sinus Venous ASD is not an uncommon variety of atrial septal defect. Timely diagnosis, proper analysis & good surgery with smooth pulmonary & systemic flow & sinus rhythm ensure quick & lifelong recovery. Patients with Warden’s procedure or a modification may need oral antiplatelet or anticoagulation for sometime, A regular follow-up helps in patients resuming normal activity without any hindrances.

**Glossary :**

- ASD: Atrial Septal Defect
- PAPVC: Partial Anomalous Pulmonary Venus Correction
- SVC: Superior Vena Cava
- PAH: Pulmonary Arterial Hypertension
- IVC: Inferior Vena Cava
- RA: Right Atrium
- LA: Left Atrium
- NSR: Normal Sinus Rhythm
- EKG: Electro Cardiogram
- CXR: Chest X-Ray
- CT: Computed Tomography
- SVASD: Sinus Venosus ASD
- LSVC : Left Superior Vena Cava

**All Illustrations by :**

**Dr. Niren Bhavsar (Cardiac Anesthesiologist)**



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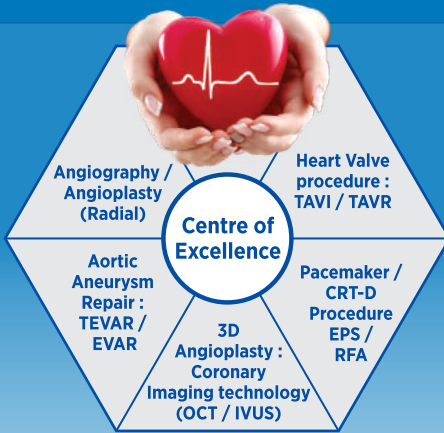


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