

## TECHNICAL NOTE – HOW I DO IT

# Correcting a sinus venosus atrial septal defect and enlarging the superior vena cava right atrial junction using a single pericardial patch

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### INTRODUCTION

Sinus venosus ASD occurs in 5 - 10% of all ASDs. They are usually associated with an anomalous right pulmonary venous drainage. Conventional surgical correction performed through an incision in the right atrium (RA) involves (untreated autologous) pericardial patch closure of the ASD in a manner which directs the flow of the anomalous veins to the left atrium (LA). The same surgical procedure has been carried out through an incision in the superior vena cava (SVC). An alternative technique, known as Warden's procedure (SVC transaction and cavo-right atrial appendage anastomosis with ASD repair) has also been used.

In some patients, the anatomy of the defect, position of the vena cava and right atrium are such that a single patch repair would cause obstruction to the SVC blood flow. In a few others, a small SVC would cause impairment of flow. In such instances, the SVC-RA junction is typically enlarged with a separate pericardial patch.

Herein a simple technique is described, to close the sinus venosus ASD and enlarge the SVC RA junction with a single pericardial patch.

### SURGICAL TECHNIQUE

The heart is approached through a median sternotomy. Loose areolar tissue is removed from the anterior pericardial surface and an abundant patch is harvested. The patient is placed on cardiopulmonary bypass (CPB) using bi-caval cannulation with a straight SVC cannula (smallest permitted by flow calculation) inserted via the right atrial appendage. The SVC tape is taken high above the entry point of the pulmonary veins. IVC is cannulated and taped. After cardioplegic arrest, atriotomy is performed in the superior part of the right atrium, more posterior than usual and extended to the SVC (lateral cavotomy) posterior to the sino atrial (SA) node (Figure 1).

A small right-angled retractor is used to retract the SVC cannula within the incision (Figure 2). This retracts the left lip of the incision and gives direct access to the ASD.

The left side of the pericardial patch is tailored and sutured to the left lip of the ASD (by continuous over and over technique). The patch is sutured to the superior and inferior lips of the ASD. The atriotomy was previously made close to the anomalous pulmonary veins on purpose. The patch is then sutured to the right lip of the atriotomy. This would direct the venous flow to the left atrium. The suture line of the right lip of the atriotomy will lie on the middle of the patch which will have a

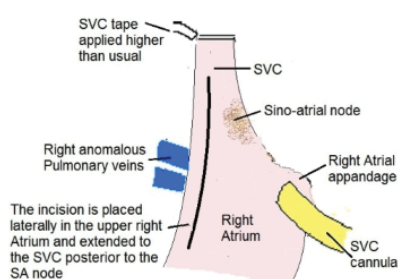


Figure 1 - diagram shows the superior part of the right Atrium and the placement of the Atriotomy

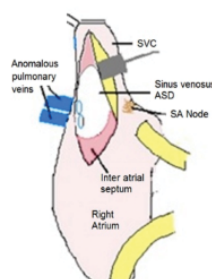


Figure 2 - The Sinus Venosus ASD exposed

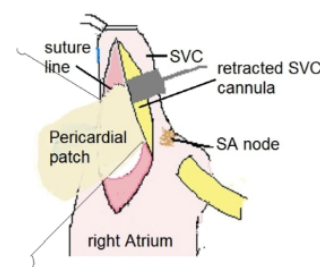


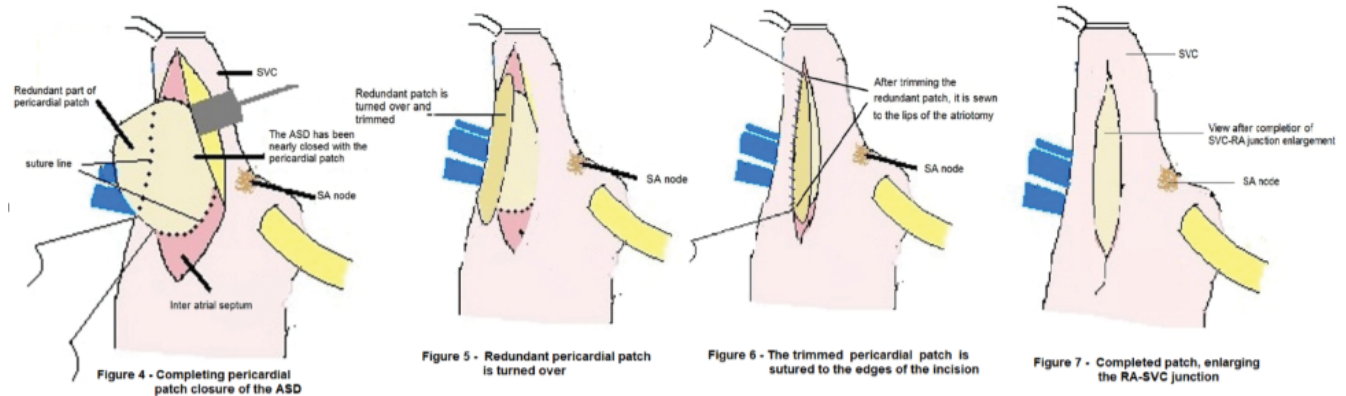
Figure 3 - Pericardial patch closure of the ASD

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redundant part on the right (Figure 4). After de-airing the left heart with a valsalva manoeuvre, the suturing is completed. This redundant pericardium is tailored, flipped over in continuity, and sutured to the cut edges of the extended atriotomy (shown in Figures 6 and 7). This procedure enlarges the SVC-RA junction.

The patient is weaned from cardio-pulmonary bypass following the usual steps and atrial and ventricular pacing wires are placed. Sternum and chest wall is then closed with drains.



## RESULTS

This procedure was used in 7 patients between 2003 and 2007. Five were females; mean age was 11.9 years (range 3 to 20 years). All had right hemi anomalous venous drainage. Two patients had additional secundum ASD which were closed using a separate pericardial patch through an inferiorly extended atriotomy.

All patients came off bypass in sinus rhythm without inotropic support. Two patients developed nodal rhythm without haemodynamic compromise, on day one but reverted to sinus rhythm within 48 hours. Another patient developed a non-sustained ventricular tachycardia with a low serum potassium. All patients were discharged between 5-7 days of surgery.

Up to 5 years follow up, all patients are in sinus rhythm, clinically well, with intact repair and do not have any gradient across the SVC-RA junction with unimpeded superior vena caval flow.

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