To the Editor: Intraatrial reentry tachycardia (IART) has been reported to occur in 2% to 10% of Mustard and Senning patients at 10 years’ follow-up. We reported a case in which the cavo-tricuspid isthmus (CTI) in both the systemic venous atrium (SVA) and pulmonary venous atrium (PVA) was necessarily targeted in a patient following Senning operation.

The patient was a 26-year-old man who was diagnosed d-transposition of the great arteries and accepted Senning operation at 14 months of age. At the age of 6 years, he underwent permanent pacemaker implantation for sinus bradycardia. In recent 2 years, he developed persistent drug refractory atrial flutter with the highest ventricular rate of 210 beats/min. and was referred for an electrophysiological study and ablation procedure in our center.

A 6-French octapolar deflectable catheter was deployed in the left atrial appendage via the right femoral vein for activation reference. An atrial flutter with a 240 ms tachycardia cycle length (TCL) was recorded. The ostium of the coronary sinus was kept in the PVA in this patient. Thus, the CTI was partitioned in two, with the inferior vena cava (IVC) portion on the SVA and the tricuspid valve (TV) portion on the PVA. Electroanatomic mapping was initiated in the more accessible SVA via right femoral vein access. The activation mapping showed a focal activation pattern with a total activation time <50% of the TCL. The PVA was mapped thereafter. A retrograde access via the femoral artery, aorta, right ventricle, and TV was used. The activation sequence achieved in PVA showed a macroreentry rotating around the TV clockwise. Entrainment pacing at multiple sites around the TV [Figure 1] confirmed the circuit with the postpacing interval approximating the TCL (≤30 ms difference). This patient had developed a significant degree of TV insufficiency, so we tried the transbaffle approach to access the PVA. The transbaffle puncture was made by a transseptal needle which was directed superiorly and anteriorly (12 o’clock). The needle traversed into the PVA through the superior portion of the baffle limb [Figure 2], an 8.5-French sheath was then advanced in the PVA through a guidewire. A linear radiofrequency (RF) lesion bridging the large scar area on the free wall of the PVA to the tricuspid annulus terminated the tachycardia. A 20-electrode mapping catheter (Halo, Biosense Webster, Inc.) was positioned in the PVA around the TV annulus through the sheath [Figure 2] with the proximal electrode pair at 1 o’clock and the distal electrode pair at 7 o’clock of the TV (viewed in the left anterior oblique projection). There was a collision of the cranial and caudal wavefronts in the mid-lateral PVA during pacing the inferior baffle of the SVA. The decision then was made to ablate the IVC portion of CTI in the SVA. A linear lesion extending from the mitral annulus to the IVC was made. After the additional ablation in the SVA, the PVA was activated in a strictly cranial-to-caudal pattern (from proximal to distal on the halo catheter) during pacing, indicating complete medial to lateral conduction block in the CTI.

At the end of the procedure, no tachycardia was inducible. No tachycardias were documented during 3 days of continuous in hospital electrocardiogram monitoring. The patient was discharged without antiarrhythmic drugs. During the 8-month follow-up, the patient was free of tachycardia recurrence.

The most common form of IART encountered in patients after Senning operation is a circuit that rotates around the TV in a manner similar to typical CTI-dependent atrial flutter.\(^{[1]}\) However, several features distinguish it from typical flutter. First, in the atrial switch population, the coronary sinus ostium and TV annulus are often on the PVA side, rather than the SVA side. Thus, the TV portion of CTI is not directly accessible from a systemic venous

![Figure 1:](attachment:image1.png)  
(a) Activation map of both atria (left anterior oblique view) showed the reentry rotated clockwise around the tricuspid valve (TV). Entrainment pacing at multiple sites around the TV in pulmonary venous atrium (PVA) confirmed the circuit. The cavo-tricuspid isthmus was partitioned in two. The inferior vena cava portion on systemic venous atrium and the TV portion on PVA, both isthmuses were involved in the circuit (revealed by entrainment); (b) Reconstruction of the contrast enhanced computed tomography.

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Successful Ablation of Cavo-tricuspid Isthmus Dependent Atrial Flutter in a Patient with Senning Operation

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approach. Although the PVA can be reached via the retrograde approach (i.e., through the aorta and right ventricle), it is usually difficult to obtain good catheter stability on the isthmus especially when a significant TV insufficiency is present, which is common in patients after Senning operation. Catheter access to this area necessitates a transbaffle puncture approach which can afford greater catheter stability. Although the transbaffle puncture from the “left-sided” SVA to the “right-sided,” PVA is quite different from the routine transseptal puncture technique. It should be noted that the puncture may actually cross the remnant atrial tissue instead of the synthetic material (e.g., Dacron or Goretex) in the case of a Senning baffle, which will make the task less tough.\(^2\)

In the current case, the reentrant circuit was bounded by an incisural scar indicated by an electrical silent area on the free wall of the PVA. A linear RF lesion bridging the scar to the TV terminated the tachycardia. However, isthmus block could be achieved only by additionally ablating the isthmus tissue in the SVA. Involvement of the CTI tissue in both atria was confirmed by entrainment mapping and ablation. Actually, in most Senning patients, the mid-CTI was bisected by the inferior baffle suture line, part of the CTI isthmus is left in the SVA. In these patients, both PVA and SVA portions of the CTI may be involved in the peri-TV reentry. Thus, biatrial isthmus ablation is necessary to achieve isthmus block and prevent long-term recurrence.\(^3\)

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