An Anterior Ablation Line Is Preferred for Perimital Flutter after Heart Transplant

BHAVANESH MAKANJEE, M.B.C.H.B., GEORGE J. KLEIN, M.D., NICHOLAS DERVAL, M.D., and ALLAN C. SKANES, M.D.

University of Western Ontario, London, ON, Canada

Perimital atrial flutter in cardiac allograft recipients is uncommon. In general, mitral isthmus ablation can be quite challenging in all patients with perimital flutter, including the subset of patients who present following left atrial ablation for atrial fibrillation. We report 2 cases where an anterior ablation line was easily performed to eliminate perimital flutter and produce bidirectional block. (J Cardiovasc Electrophysiol, Vol. pp. 1-3)

Introduction

De novo perimital atrial flutter in cardiac allograft recipients is uncommon. In general, mitral isthmus ablation for this can be quite challenging in all patients with perimital flutter, including the subset of patients who present following left atrial ablation for atrial fibrillation. The ease and efficacy of isthmus ablation in cardiac allograft recipients is not known. We report 2 such patients in whom an anterior ablation line proved expedient to eliminate reentry.

Case 1

A 65-year-old man presented with atypical atrial flutter 13 years following a cardiac transplant (Fig. 1). His past medical history was remarkable for rheumatic fever in childhood, a mitral commissurotomy at age 25, and a mechanical aortic and mitral valve replacement at age 28. He subsequently developed intractable heart failure at age 51 for which he received a cardiac transplant. This was performed utilizing a bariatric anastomosis.

At presentation there was no evidence of transplant rejection or systemic illness. A transthoracic echocardiogram revealed normal left ventricular systolic function, severe bariatric enlargement with the left atrium measuring 60 mm, and no intracardiac thrombus. At electrophysiological study, both the native right atrium and the donor atria were in dissociated atrial flutters (not shown). The cycle length in the native right atrium (CL 180 ms) was shorter than in the donor atria (CL 200 ms), with no evidence of any neo atrio–atrio connection. The native right atrial flutter was terminated with pacing from the native right atrium, with no perturbation of the slower atrial flutter in the donor atria. Dissociated atrial beats were noted thereafter in the native right atrium (Fig. 2). The boundary between the donor atrium (in atrial flutter) and the native atrium (in a dissociated rhythm and labeled as scar on activation map, Fig. 3)

Case 2

A 49-year-old man presented with symptomatic atypical atrial flutter 24 years following a cardiac transplant. This had been performed utilizing a bariatric anastomosis. His palpitations were poorly tolerated, requiring cardioversions on two separate occasions, and were recurrent despite amiodarone 200 mg per day being instituted. His prior medical history was significant only for an idiopathic dilated cardiomyopathy.

A transesophageal echocardiogram revealed no evidence of left atrial thrombus, bariatric enlargement, and normal left ventricular systolic function. The patient was in atrial flutter (CL 280 ms) at the commencement of the electrophysiological study. This was confirmed as perimital flutter with entrainment mapping and electroanatomical mapping (CARTO, Biosense Webster, Diamond Bar, CA, USA).

A single anterior ablation line from the mitral annulus at 12 O’clock to the posterior suture line was created. This linear ablation measured 3.9 cm and required 6.2 minutes of radiofrequency delivery (1 lesion). Bidirectional block across the line was confirmed. A conventional mitral isthmus line was not attempted. During ablation there was a reversal in the coronary sinus atrial activation sequence with sequential activation from the proximal to the distal coronary sinus. The cycle length of this

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tachycardia remained constant at 280 ms and entrainment at the mitral annulus now yielded a long postpacing interval (PPI 450 ms). Catheter manipulation at the cavitricuspid isthmus resulted in termination of the flutter without ectopic activity (catheter bump). A conventional cavitricuspid isthmus ablation was subsequently performed in sinus rhythm. No atrial flutter was inducible thereafter. He remains well after 3 months of follow-up.

**Discussion**

Atrial flutter in cardiac allograft recipients is fairly common. These arrhythmias may occur in the immediate postoperative period, with acute rejection or with transplant vasculopathy. In stable cardiac allograft recipients, atrial flutter is usually cavitricuspid isthmus dependent, whereas left atrial perimital flutters are distinctly unusual. Vaseghi et al. reported only 2 patients with perimital flutter in a cohort of 729 patients who underwent orthotopic cardiac transplant.

A conventional posterolateral mitral isthmus line can be challenging even in patients with structurally normal hearts. The line of ablation between the lateral mitral isthmus and the ostium of the left inferior pulmonary vein may be anatomically short (17–51 mm) but can be technically demanding. In their series of 100 consecutive patients, Jaïs et al. needed more than 30 minutes of radiofrequency delivery in 20% of patients in order to achieve complete block.

A major determinant of difficulty may be regional anatomy and maintaining catheter stability at the isthmus. The thickness of the local atrial tissue can be variable and quite considerable in some instances, with left atrial myo-
occardium measuring between 1.4 mm to 7.7 mm at the isthmus just adjacent to the left inferior pulmonary vein (Fig. 6).

The mean transmural thickness of the left atrial anterior wall, on the other hand, was 1.86 mm (SD±0.59) in one series.

An anterior mitral line in our patients proved straightforward. Even though the line of ablation is usually anatomically longer compared with the traditional lateral mitral isthmus, the anastomotic suture line forms an easily reached posterior boundary in cardiac allograft patients who have had a biatrial anastomosis. Additionally, the atrial wall is usually relatively thin. In our patients, the anterior lines of ablation were 4.0 cm and 3.9 cm in length, respectively. Potentially, this may be relevant in patients with atrial fibrillation who have undergone left atrial catheter ablation and who subsequently who present with perimital flutter. Left atrial ablation may have included a roof line ablation that may simulate the anastomotic suture site in orthotopic allograft recipients.

**Conclusion**

In cardiac allograft recipients presenting with perimital flutter, an ablation line between the anterior annulus and the posterior suture line appears to be significantly easier than the usual posterior mitral isthmus line.

This merits further assessment in patients with atrial fibrillation who develop perimital flutter following left atrial ablation, especially if they have had a roofline ablation that may simulate the anastomotic suture site in cardiac allograft recipients.

**References**

Queries

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