

Box Lesion in the Open Left Atrium for Surgical Ablation of Atrial Fibrillation

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Objective:

Maze with a "box lesion" around the pulmonary veins is currently gold standard procedure. Recently, we changed our surgical ablation of atrial fibrillation technique from standard bilateral epicardial pulmonary vein isolation with interconnecting lesions, to a "box lesion" procedure with a bipolar radiofrequency ablator. Our study describes this new technique.

Methods:

Between March 2009 and June 2012 we performed 90 ablations by the "box" technique, using a bipolar radiofrequency device. Fifty-five (61%) patients had persistent and 21 (23%) long-standing persistent atrial fibrillation. Left atriotomy was performed along the interatrial septum. Left atrial appendage was amputated. The "box" was made by connecting the left atriotomy to the base of the amputated appendage with lines along the transverse and oblique sinuses by epi- and endocardial application of a bipolar radiofrequency ablator. Left atrial isthmus was ablated by cryoprobe.

Results:

Follow-up was 402 ± 258 days, and was performed by electro physiologists and surgeons. There were no ablation-related complications. The "box" technique was easy to perform, with no dissection around the pulmonary veins, and was found to be particularly effective when surgery was performed through the right minithoracotomy incision (5 patients). Eighty (94%), 69 (93%) and 47 (91%) patients were in sinus rhythm at 6 months, and at 1 and 2 years of follow-up, respectively. 78%, 88% and 85% of patients with sinus rhythm were free from antiarrhythmic medications at 6 months, 1 year and 2 years of follow-up, respectively.

Conclusions:

The "box lesion" technique provides excellent freedom from atrial fibrillation, and may improve transmural ablation due to ablation of one rather than two layers of atrial wall, as in epicardial pulmonary vein isolation. Furthermore, this technique deems dissection around the pulmonary veins unnecessary, and was found to be particularly effective when surgery was performed through the right mini-thoracotomy incision.