Left Atrial Ablation for Atrial Fibrillation: Box Lesion Versus Epicardial Pulmonary Vein Isolation

Sternik, Leonid[1]; Luria, David[2]; Glikson, Michael[2]; Kogan, Alexander[1]; Malachy, Ateret[1]; Levin, Shany[1]; Raanani, Ehud[1]
[1]Sheba Medical Center, Tel-Hashomer, Cardiac Surgery Dept, Ramat Gan, Israel; [2]Sheba Medical Center, Cardiology Dept, Ramat Gan, Israel

Background: Maze with a "Box lesion" around pulmonary veins (PV) is the gold standard procedure. Recently, we changed our technique of surgical ablation of atrial fibrillation (AF) from standard bilateral epicardial PV isolation to "Box lesion" with bipolar radiofrequency (RF) ablator. In this study we compare these techniques.

Methods: Between March 2009 and October 2011 we performed AF ablation in 70 patients by the "Box" technique around the PV, using a bipolar RF device. Patients were 64 ± 10 years. 40 (56%) patients had persistent and 15 (22%) permanent AF; "Box" was made by connecting left atriotomy to the base of amputated left atrial appendage with two lines along transverse and oblique sinuses by epi- and endocardial application of a bipolar RF device. Left atrial isthmus was ablated by cryoprobe. Non-box group of 80 patients was operated by epicardial PV isolation with interconnecting lesions and left atrial isthmus lesion with the same devices.

Results: No complications were related to the ablation. Both groups were matched retrospectively to be statistically similar from all preoperative parameters. 63 (79%) patients in non-box group and 64 (92%) patients in box group were in sinus rhythm at discharge (p=0.05). 58 (74%) patients in non-box group and 65 (93%) of patients in box group were in sinus rhythm at 1 year follow-up (p=0.044).

Conclusions: "Box lesion" is easier to perform and provides better freedom from AF than bilateral epicardial PV isolation with interconnecting lesions. We can explain it by better transmurality achieved by applying bipolar RF ablator only on one layer of atrial wall in contrary to epicardial PV isolation.