Left Atrial Ablation For Atrial Fibrillation: Box Lesion With Bipolar Radiofrequency Device

L. Sternik, D. Spiegelstein, H. Cohen, D. Luria, M. Glikson, S. Levin, E. Raanani.

Cardiac Surgery, Sheba Medical Center
and Heart Center,
Sheba Medical Center, Ramat Gan, Israel,

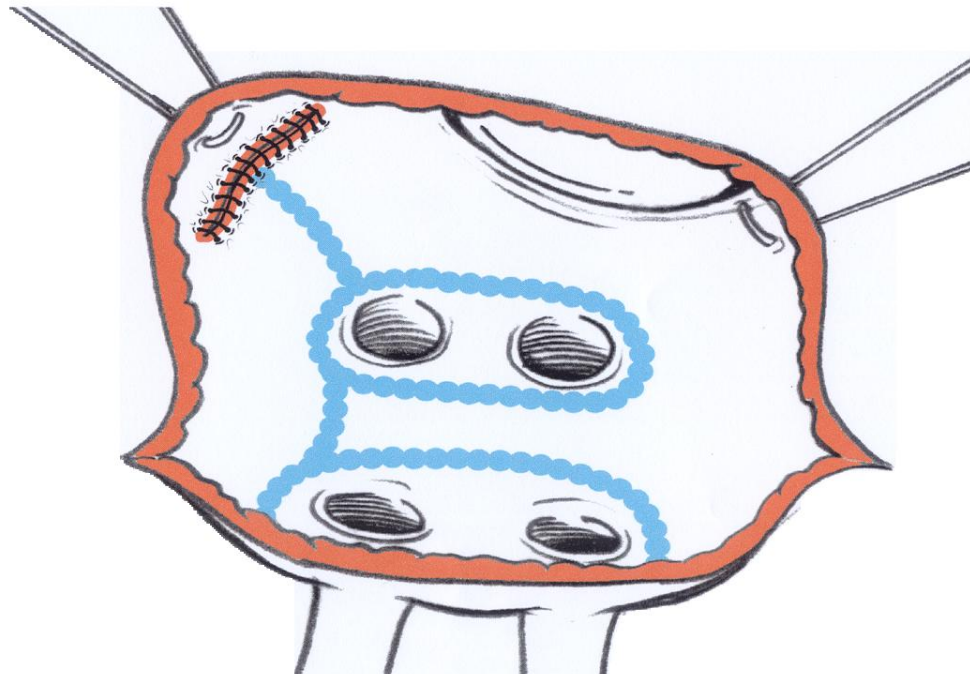
DISCLOSURE

No authors have any financial interest in this presentation

Pulmonary Vein Isolation with Interconnecting lesion

Left Atrial Procedure

Pulmonary Veins



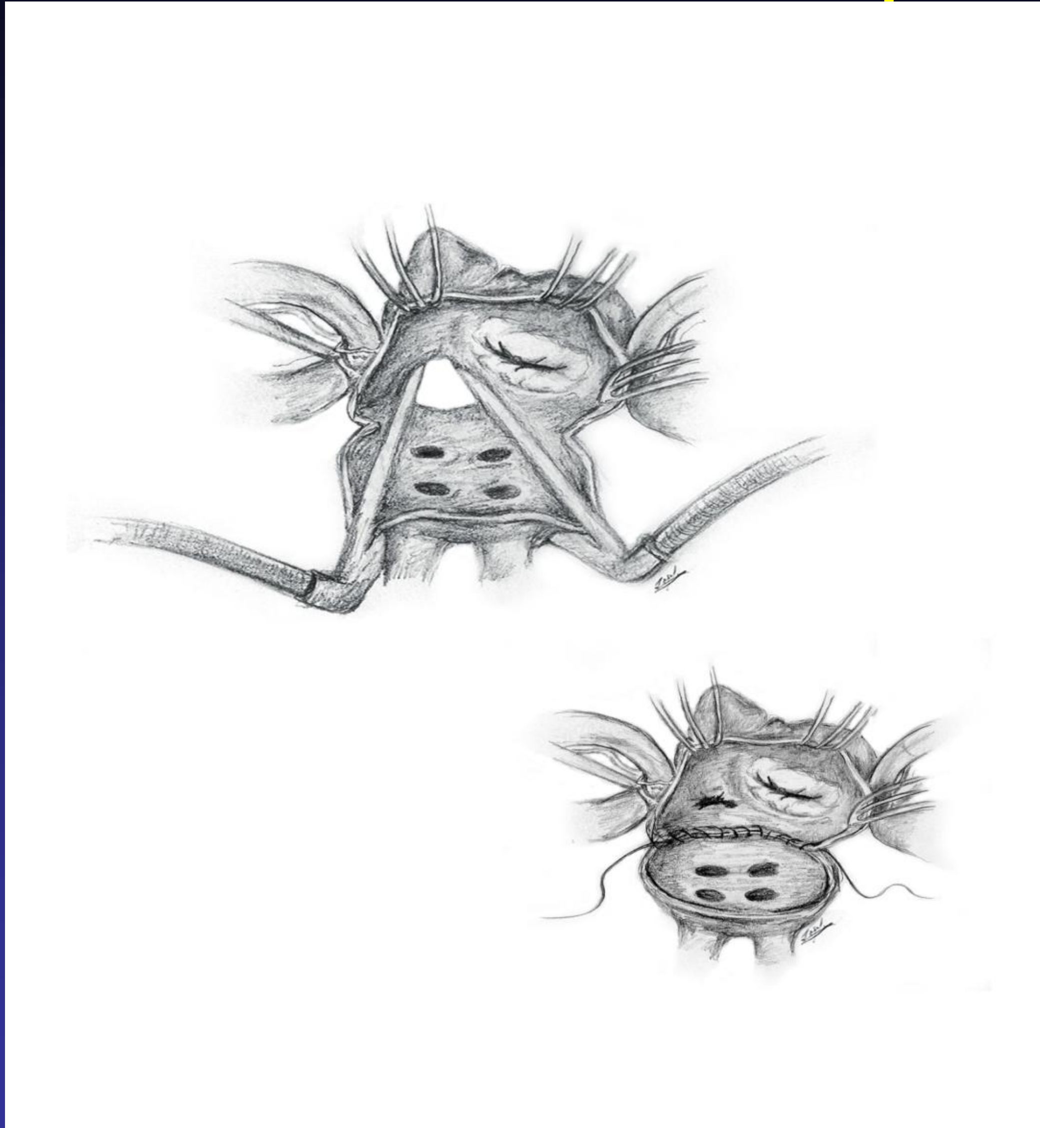
Ref: Dr Hauw Sie, "The Surgical Treatment of Atrial Fibrillation"

Disadvantages of Epicardial Pulmonary Vein Isoaltion

- Ablation of two layers of atrial wall in epicardial pulmonary vein isolation can give problems with transmurality due to excessive tissue thickness

- Dissection around the pulmonary veins could be complicated especially with aberrant veins.

“Box lesion” - last 57 patients



Procedure

Maze III lesion set

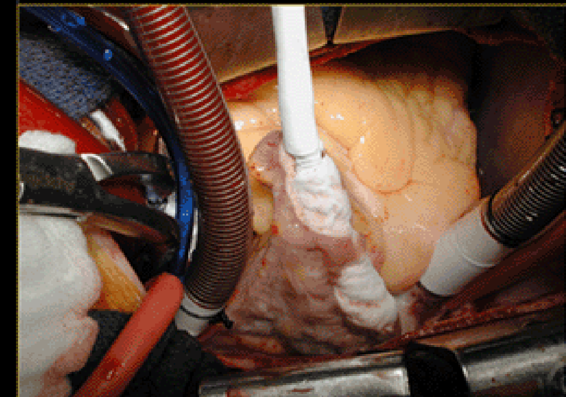
Bipolar RF – transmularity

- no collateral damage

Cryo-

In areas where

bipolar RF is impossible (Left Atrial Isthmus and Mitral Valve Annulus) -



Patients

- Feb 2004 – Feb 2011 - 263 patients
- 207 pts
  Surgical Ablation including Bilateral Epicardial Pulmonary Vein Isolation
- 57 pts (last)
  Surgical Ablation including Box Lesion

Preoperative patient characteristics

	N=57
Age (y)	64 ± 10
Males	36 (64%)
Atrial Fibrillation Type:	
Permanent	14 (25%)
Persistent	31 (54%)
Paroxysmal	12 (21%)
Atrial Fibrillation Time (years):	
< 1	11 (20%)
1-5	22 (38%)
5-10	19 (33%)
>10	5 (9%)
Left atrial volume > 200cm³	7 (13%)

Ablation type and operative data

	N=57
Mitral valve surgery	38 (66%)
Mitral replacement	13 (34%)
Mitral repair	25 (66%)
Non-mitral surgery	19 (34%)
Isolated Maze	3 (5%)
CPB time (min)	120 ±97
Cross-clamp time (min)	97±27
Mortality	0
Rhythm at discharge:	
Sinus	52 (92%)
Atrial fibrillation/Flutter	5 (8%)
Permanent pacemaker	1 (3%)

CPB – cardio-pulmonary bypass

Early and mid-term results

	N=56
Length of follow-up (months)	8± 6
Rhythm at follow-up 3 months:	
Sinus Without AAD Without Coumadin	89% 88% 13%
Atrial fibrillation/Flutter	11%
Rhythm at follow-up 6 months:	
Sinus Without AAD Without Coumadin	94% 93% 27%
Atrial fibrillation/Flutter	6%
Rhythm at follow-up 12 months:	
Sinus Without AAD Without Coumadin	85% 88% 59%
Atrial fibrillation/Flutter	15%

Follow-up Protocol

- Surgeon/Electrophysiologist
- 1, 3, 6 and then every 6 month
- Holter ECG, Echo, Atrial Contractility?
- "AF Alarm"

Conclusion

- With "Box lesion" around the pulmonary veins we expect to improve transmurality due to epi- and endocardial ablation of one rather than two layers of atrial wall, as in epicardial pulmonary vein isolation.
- Isolation of the entire posterior wall of the left atrium rather than only the pulmonary veins is better electrophysiologically
- Dissection around the pulmonary veins unnecessary. This dissection could be complicated especially with aberrant veins.