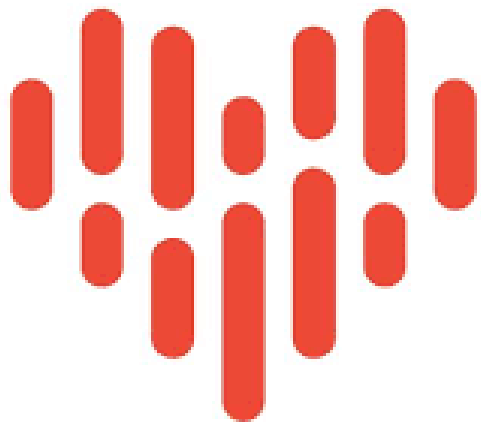


Hybrid convergent AF ablation



Dr Frédéric A SEBAG

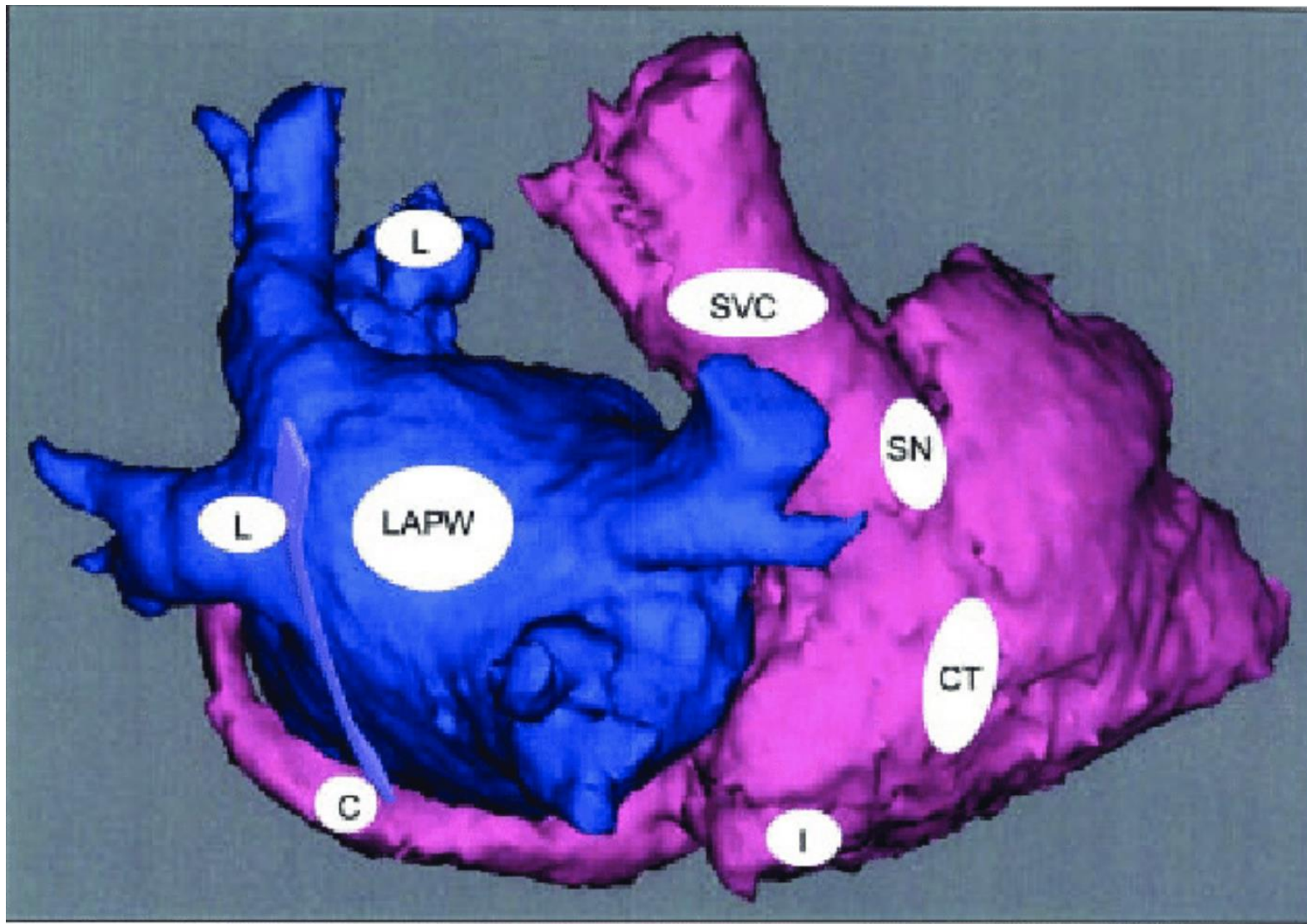
Rythmopole.paris

Electra meeting May 20th

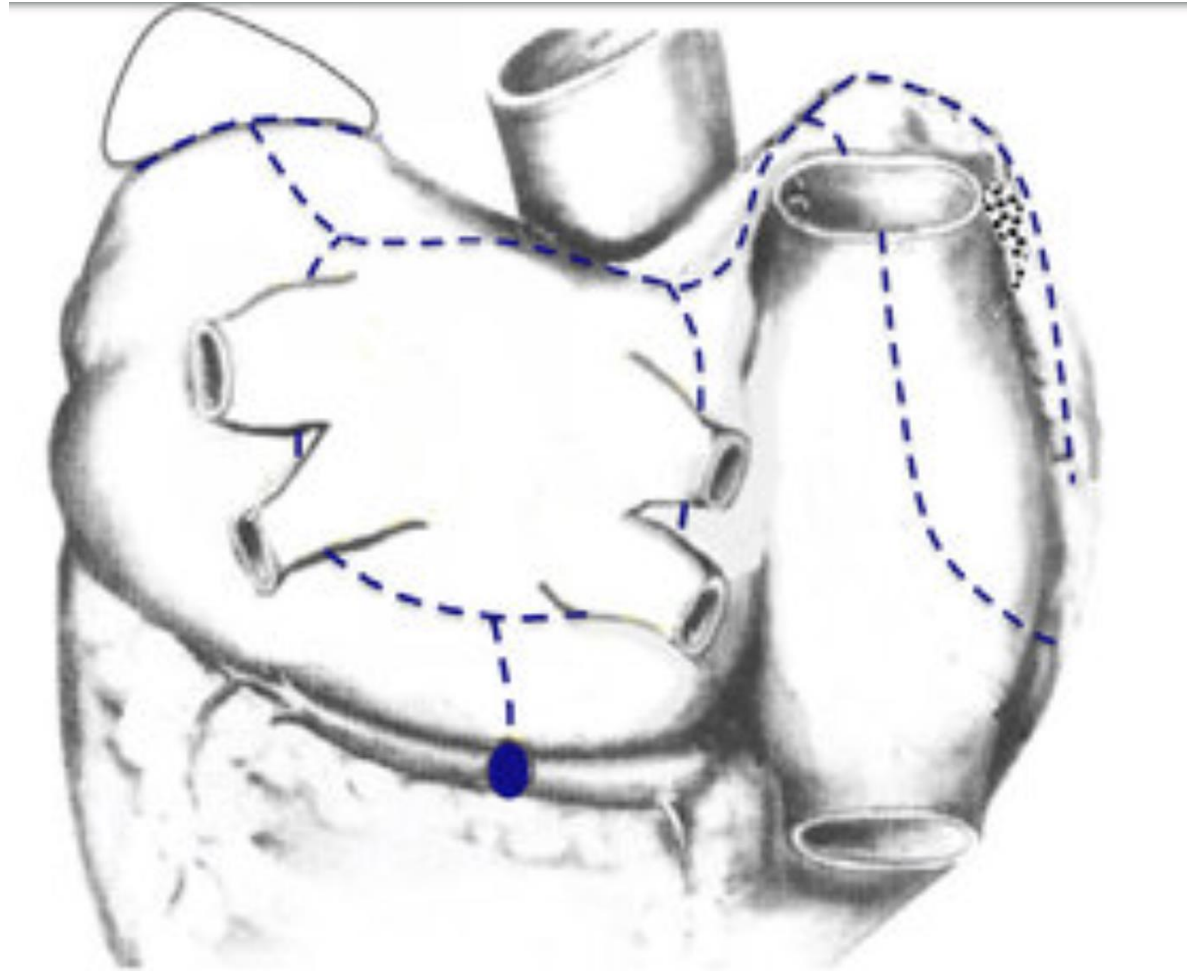
Conflict of Interest

- None to declare

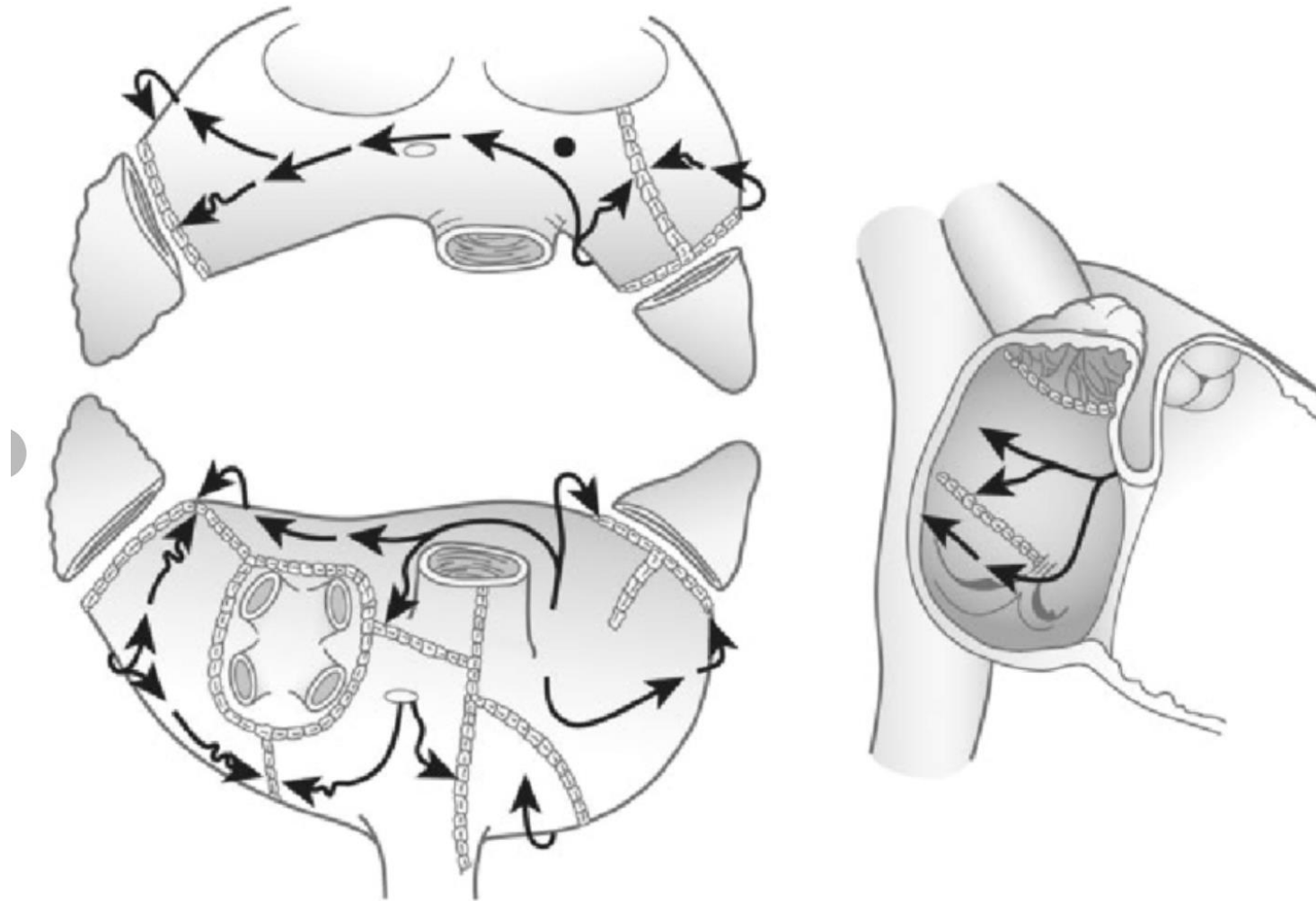
Non PV Triggers



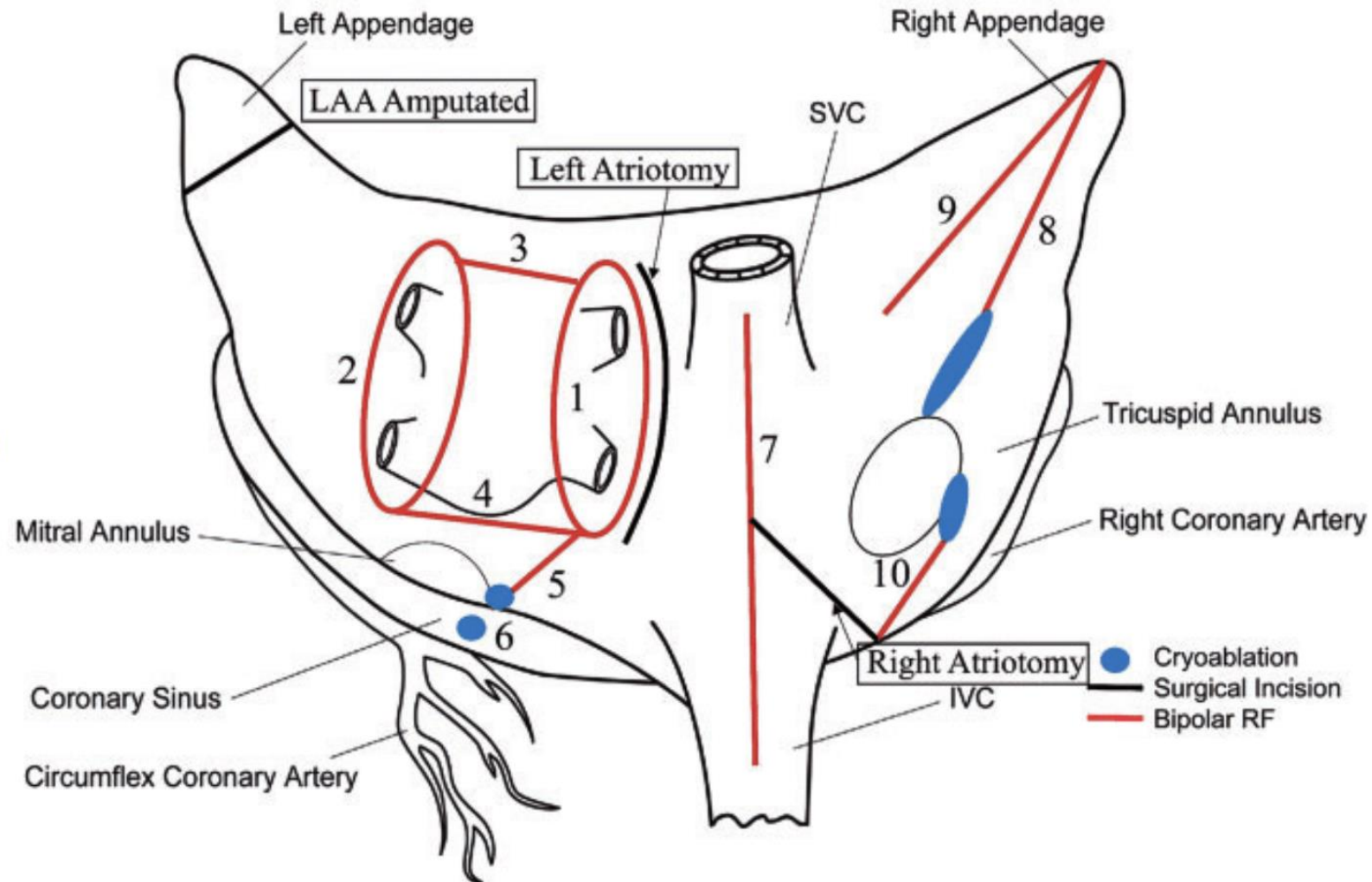
History COX MAZE I: 1987



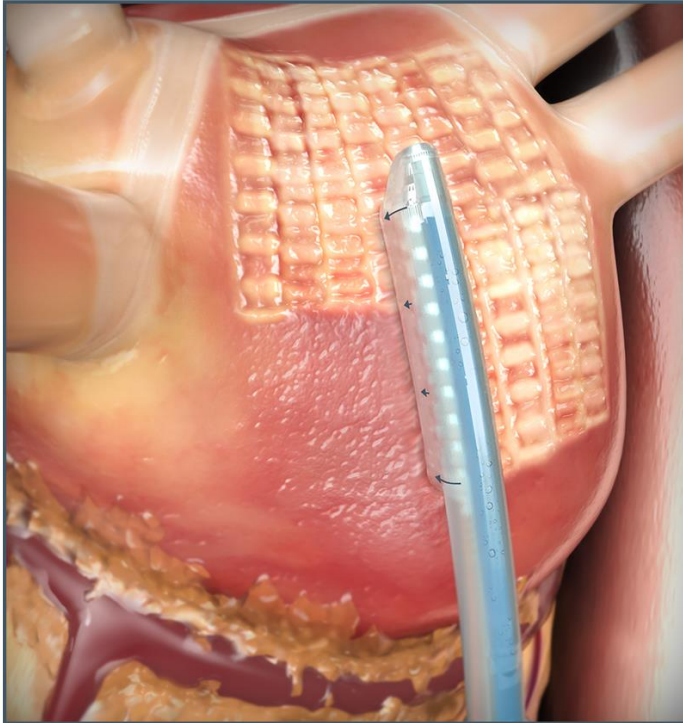
History COX MAZE III: 1990s



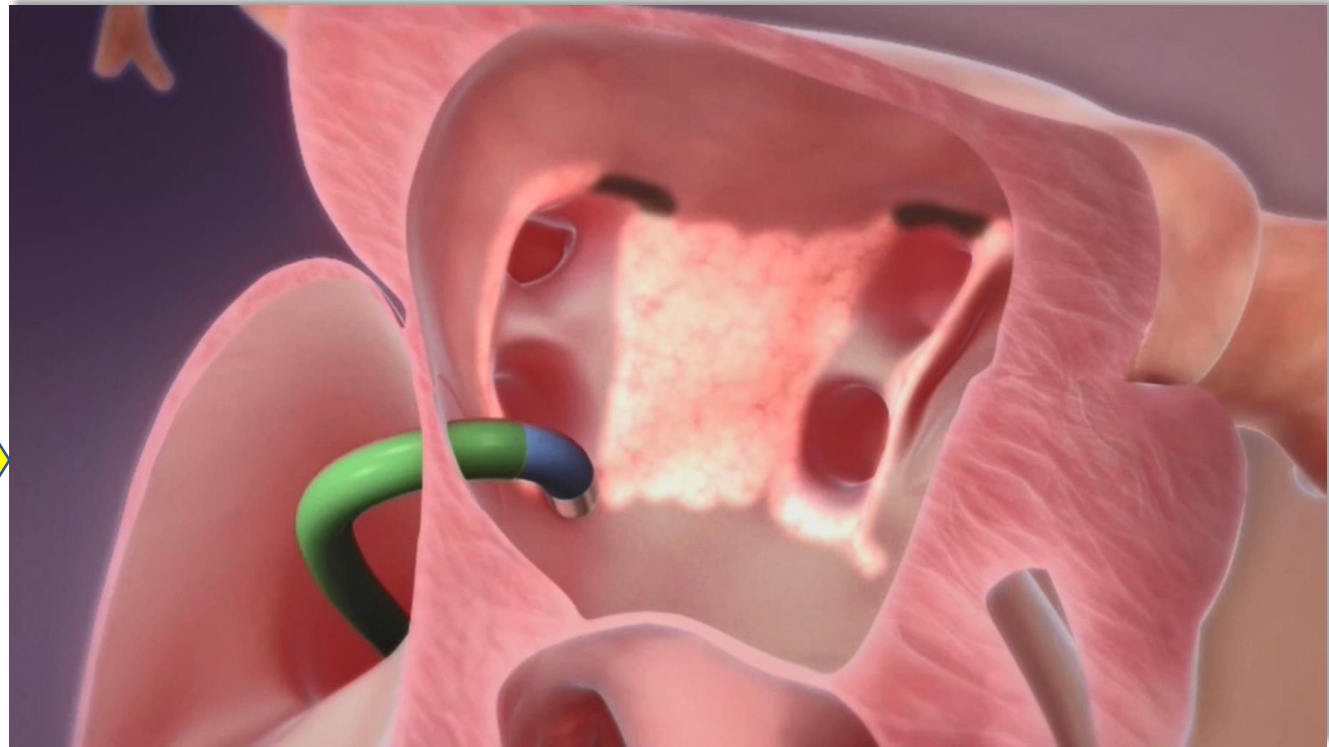
History COX MAZE IV: 1999



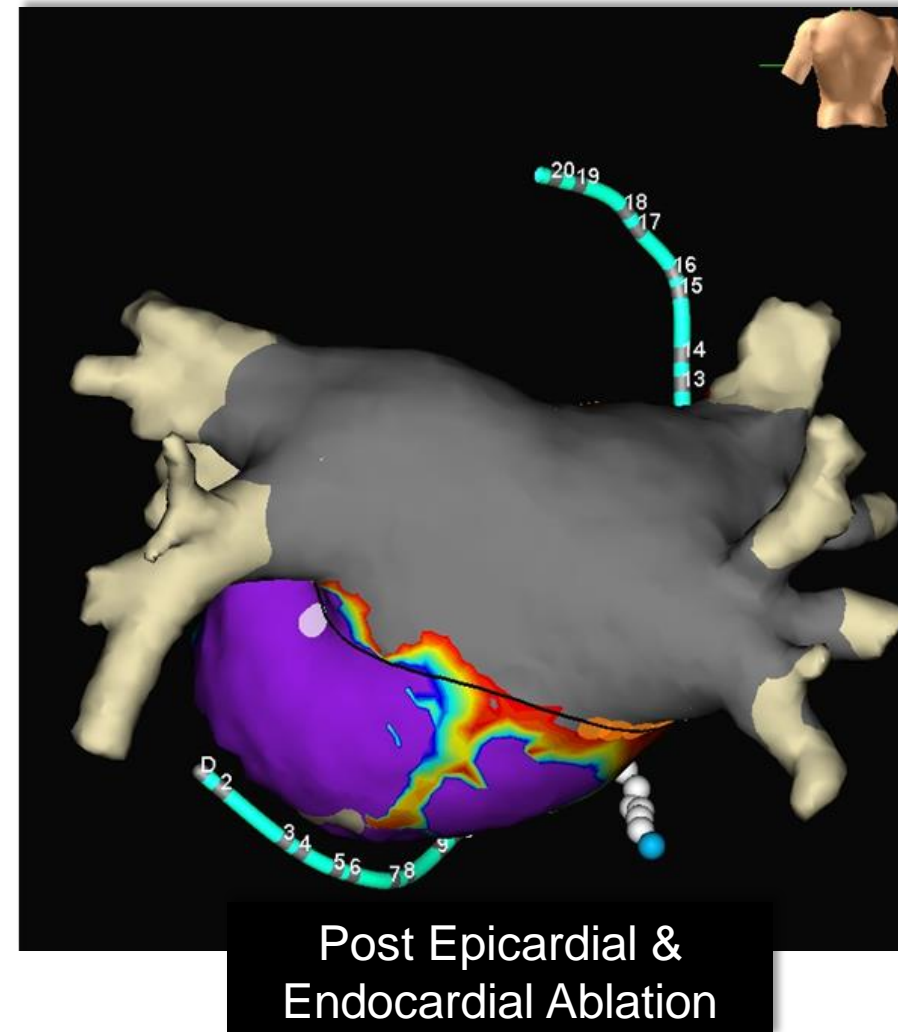
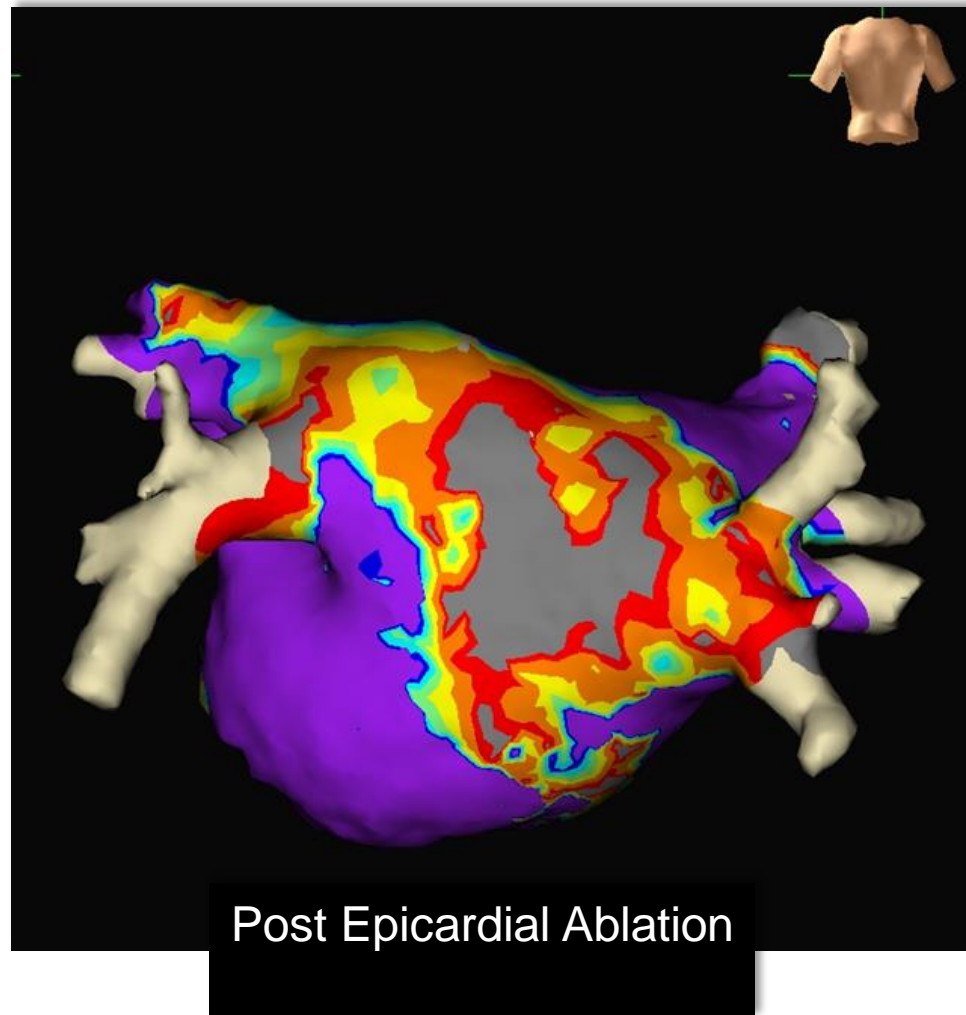
Hybrid Approach:



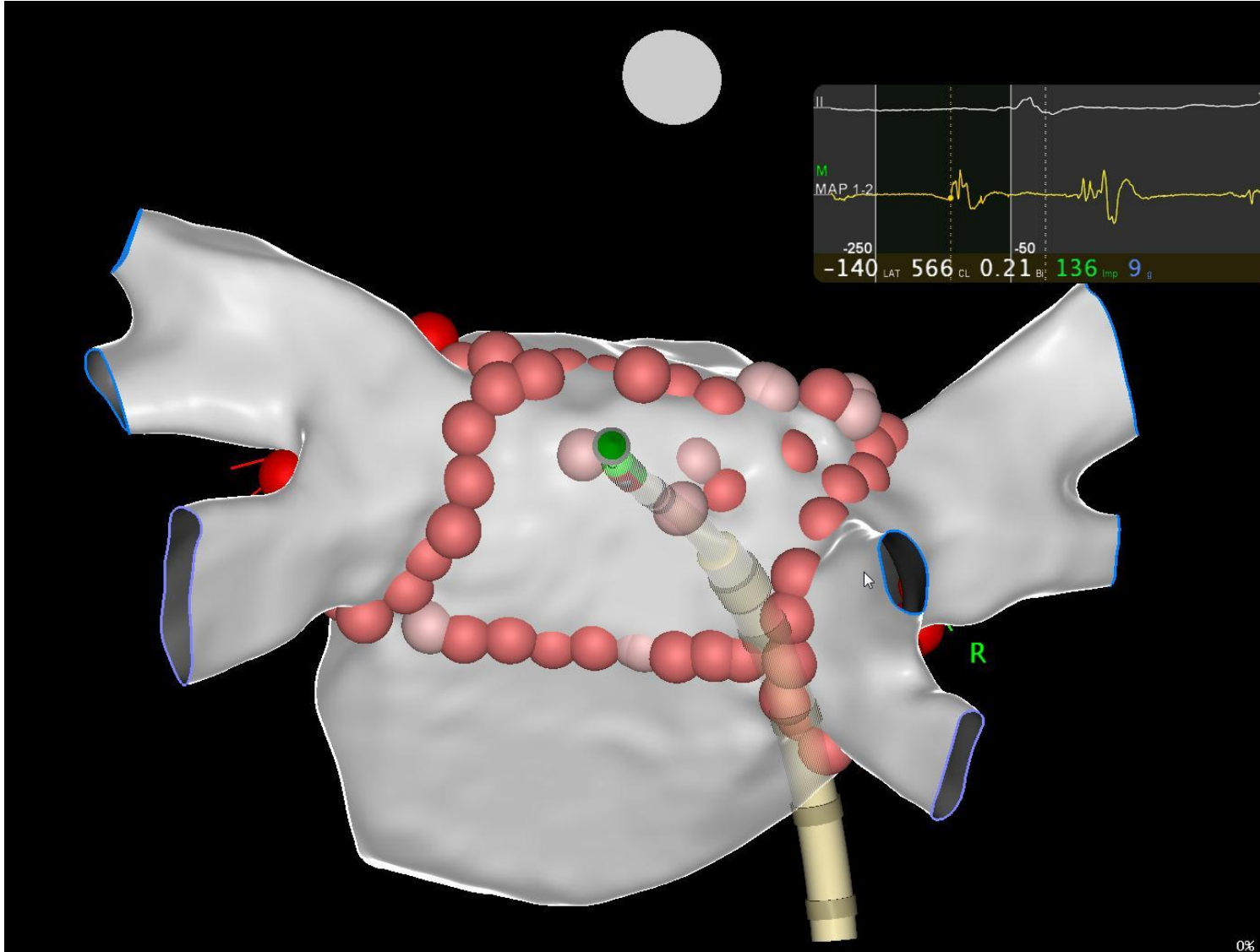
**Same
or
Staged**



From the EP point of view



From the EP point of view: It's doable endo



Pros

&

Cons

- Epicardial lesions
- far from PVs, Phrenic N, Oeso
- Visualisation of ablation
- Transmural lesion
- Linear lesions
- LAA removal or Exclusion
- Ablation or ligation of VOM
- SVC isolation possible
- GPs ablation possible

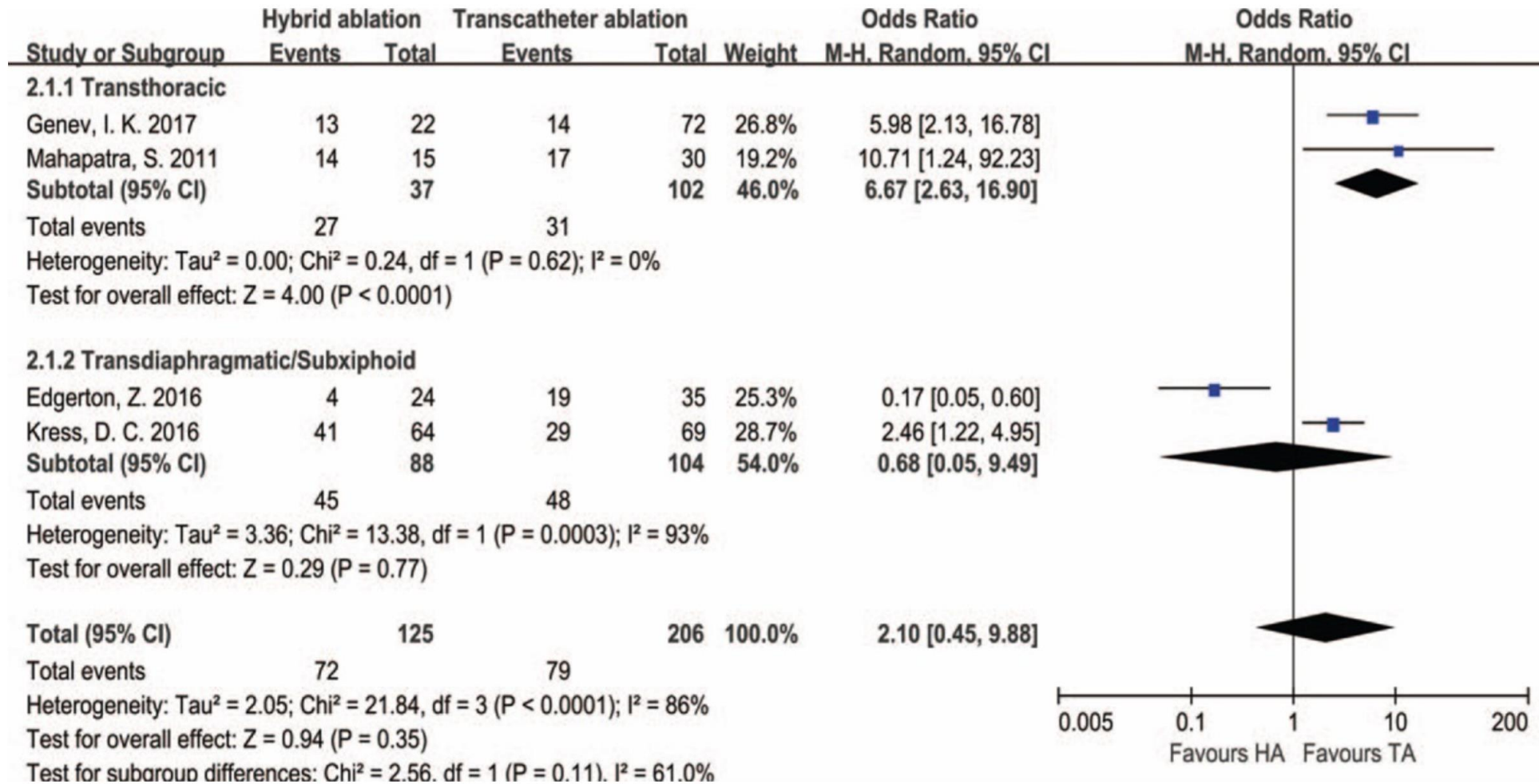
- Pericardial reflections
- Epicardial fat
- Mitral line impossible (Cx)
- No mapping system
 - No block validation
 - No CAFEs ablation
 - No flutter mapping
- 2 procedures
 - With some morbidity in the first
- Need trained (and kind) surgeons

Metanalysis

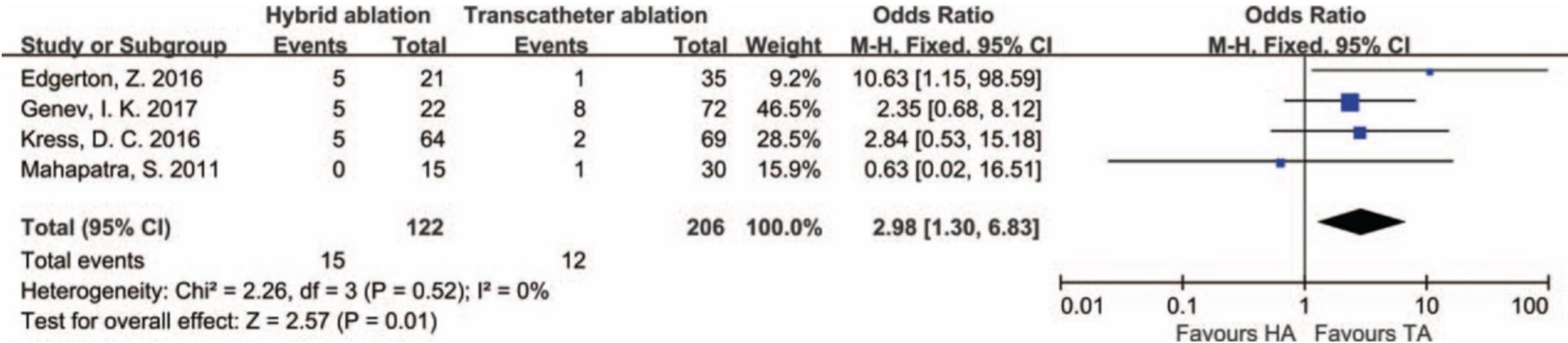
Studies	Timing	Hybrid procedure (Minimally invasive SA)	Hybrid procedure (TA)	Transcatheter procedure	Follow-up
Mahapatra ^[11]	Staged, TA performed 3–5 d after minimally invasive SA	RFA, bialateral thoracoscopic PVs were ablated and tested for evidence of entrance/exit block. Isolation of SVC, placement of roof line, mitral line, elimination of ganglia response, LOM ablation, and LAA exclusion	RFA. If atrial flutter was induced, it was mapped and ablated. If AF was induced, checking PVs isolation, roof line, then mitral isthmus line and CFAEs were performed	RFA. Antral ablation, roof line, and CTI line. Mitral line was made in 17 cases, CS ablation performed in 9 cases, SVC isolated in 11 cases, and CFAEs performed in 12 cases	EKG, 7-d Holter, 24-h Holter, telephone
Edgerton ^[13]	Concomitant	RFA, subxiphoid. Using irrigated unipolar RF ablator to perform PVs, posterior wall, LOM (without dissection) and the lateral right atrium isolation. Assessing PVs entrance and exit block	RFA. Verification of the surgical lesions Further ablation: CS and LAA. If CFAEs were detected in the LA, they were ablated	RFA. Isolation of PVs, posterior wall, LOM, CS, LAA, and right atrium	EKG, 7-d Holter, AADs was continued after 3 mo
Kress ^[12]	Concomitant	Cryo or RFA, transdiaphragmatic. Isolation of PVs, posterior LA wall with a 3-cm Numeris probe which was saline-irrigated and vacuum attached, at 30W for 90 s	Isolation of PVs with catheter ablation or the cryoballoon, CFAEs and linear lesions with RFA	Isolation of PVs with RFA or cryoballoon, CFAEs and linear lesions with RFA	EKG, loop recorder, Holter, AADs was permitted
Genev ^[14]	NA	Mini thoracotomy	NA	NA	NA

AADs = antiarrhythmic drugs, CFAEs = complex fractionated atrial electrograms, Cryo = cryoablation, CS = coronary sinus, CTI = cavotricuspid isthmus, EKG = Electrocardiogram, LA = left atrium, LAA = left atrial appendage, LOM = ligament of Marshall, NA = not available, PVs = pulmonary veins, RFA = radiofrequency ablation, SA = surgical ablation, SVC = superior vena cava, TA = transcatheter ablation.

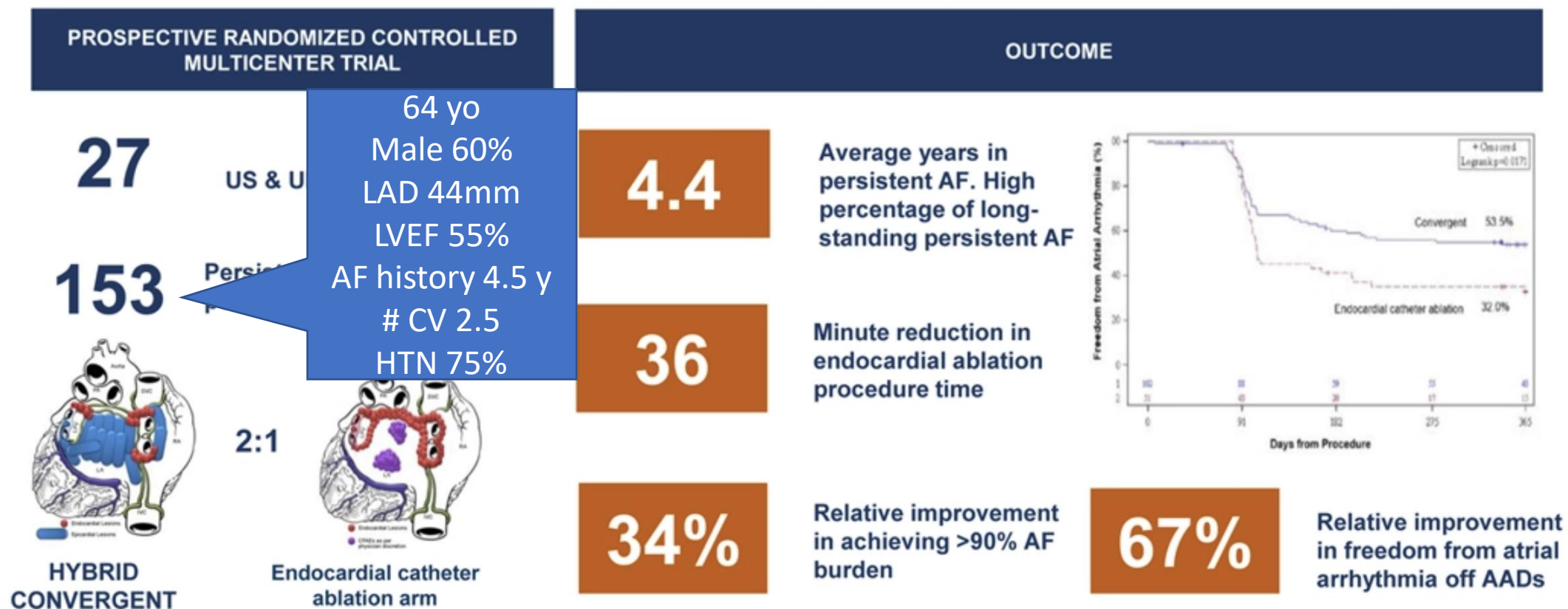
Metanalysis



Metanalysis



Hybrid AF Convergent Procedure Vs Endocardial Catheter Ablation Alone for the Treatment of Drug Refractory Persistent and Longstanding Persistent AF (CONVERGE Trial)



More data needed

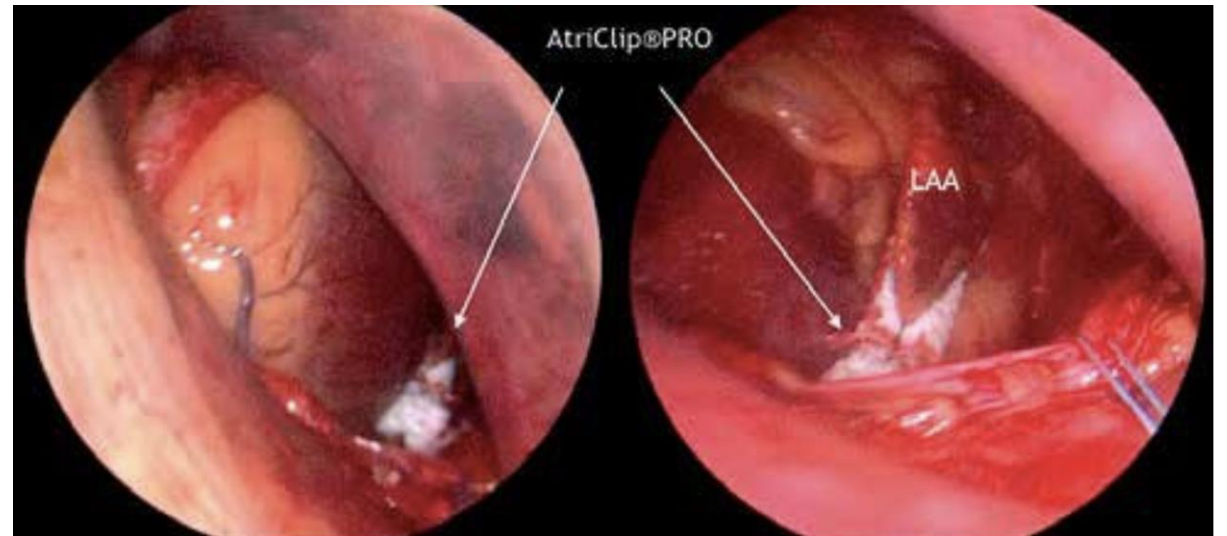
Title	Trial ID	Status	Location
Hybrid ablation of persistent and long-standing persistent stand-alone atrial fibrillation	NCT02832206	Recruiting	Charles University, Czech Republic
Two-stage hybrid ablation or thoracoscopic epicardial ablation for long-standing persistent atrial fibrillation (THAT-LSPAF)	NCT03708471	Recruiting	Guangzhou, Guangdong, China
Hybrid therapy and heart team for atrial fibrillation (HT2AF)	NCT03737929	Recruiting	University Hospital, Toulouse
Comparison between one-stage hybrid ablation and thoracoscopic surgical ablation for intractable atrial fibrillation	NCT03127423	Recruiting	Beijing, China
One staged hybrid approach of surgical/catheter ablation for persistent atrial fibrillation	NCT02968056	Recruiting	Ju Mei, Xinhua Hospital, Shanghai Jiao Tong University School of Medicine
Combined endoscopic epicardial and percutaneous endocardial ablation versus repeated catheter ablation in persistent and longstanding persistent atrial fibrillation (CEASE-AF)	NCT02695277	Recruiting	Multiple sites, international
CONVERGE CAP study-for the treatment of symptomatic persistent or long-standing persistent AF (CAP)	NCT04239534	Not yet recruiting	–
Thoracoscopic ablation versus catheter ablation in patients with atrial fibrillation (TACAAF)	NCT04237389	Recruiting	Revishvili Amiran Shotaevich, National Research Center of Surgery, Russia
Dual epicardial endocardial persistent atrial fibrillation study (DEEP)	NCT01661205	Recruiting	Multiple sites, international

Indications: difficult cases

- Previous AF ablation failures
- Ls Pers AF
- Large LA (LAVI $>60\text{ml/m}^2$)
- Low LVEF $<35\%$
- Concomittant LAA closure
- ...

Our approach

- Left lateral mini-thoracotomy
- Left atrial Atriclip[®]
- LAPW ablation +/- PVI
- LOM clip or ablation
- 16 patients included
 - Enrollement started in Sept 21
 - No acute complications



Conclusion

- Existing alternative
- Lack of data to convince Eps the need of a cardiac surgery procedure to obtain PVI+ PWI
 - More durable results?
 - Many combos
- 2 procedures with possible complications
- Extra LAA closure, VOM ablation achievable