Barts and The London NHS
NHS Trust

Barts and The London
School of Medicine and Dentistry

Barts and The London
Cardiovascular Biomedical Research Unit

Smarttouch - the technology and practical aspects of its use

Richard Schilling

William Harvey
Research Institute

Disclosures

- Research/consultancy agreements with:
  - –Biosense Webster
  - –St Jude
  - –Medtronic
  - –Hansen medical
  - –Boston Scientific

Setting up smarttouch

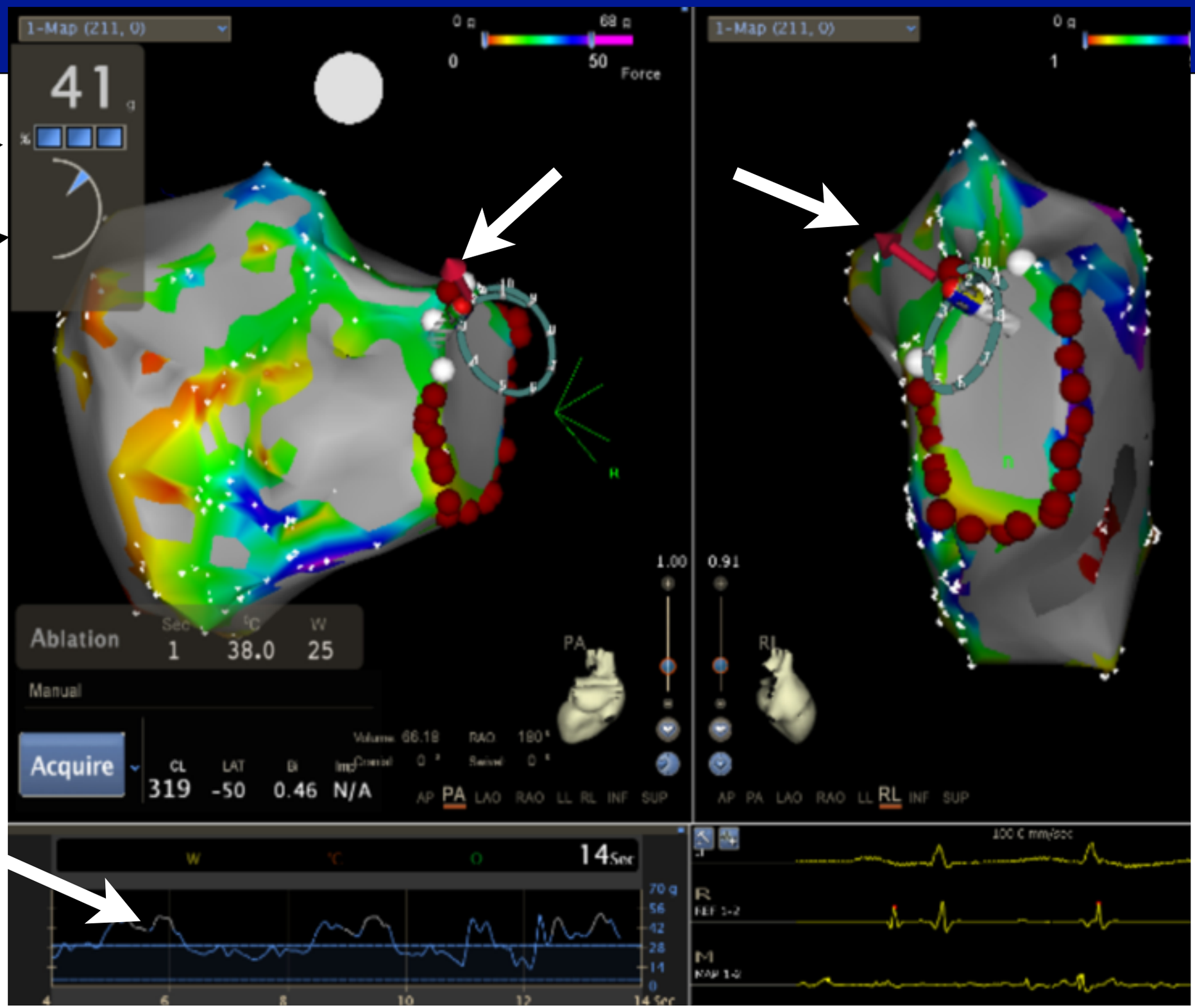
- Put the catheter in at start of case
- Create geometry
- Make sure it is not in contact
- Zero the pressure

Smarttouch display

Force

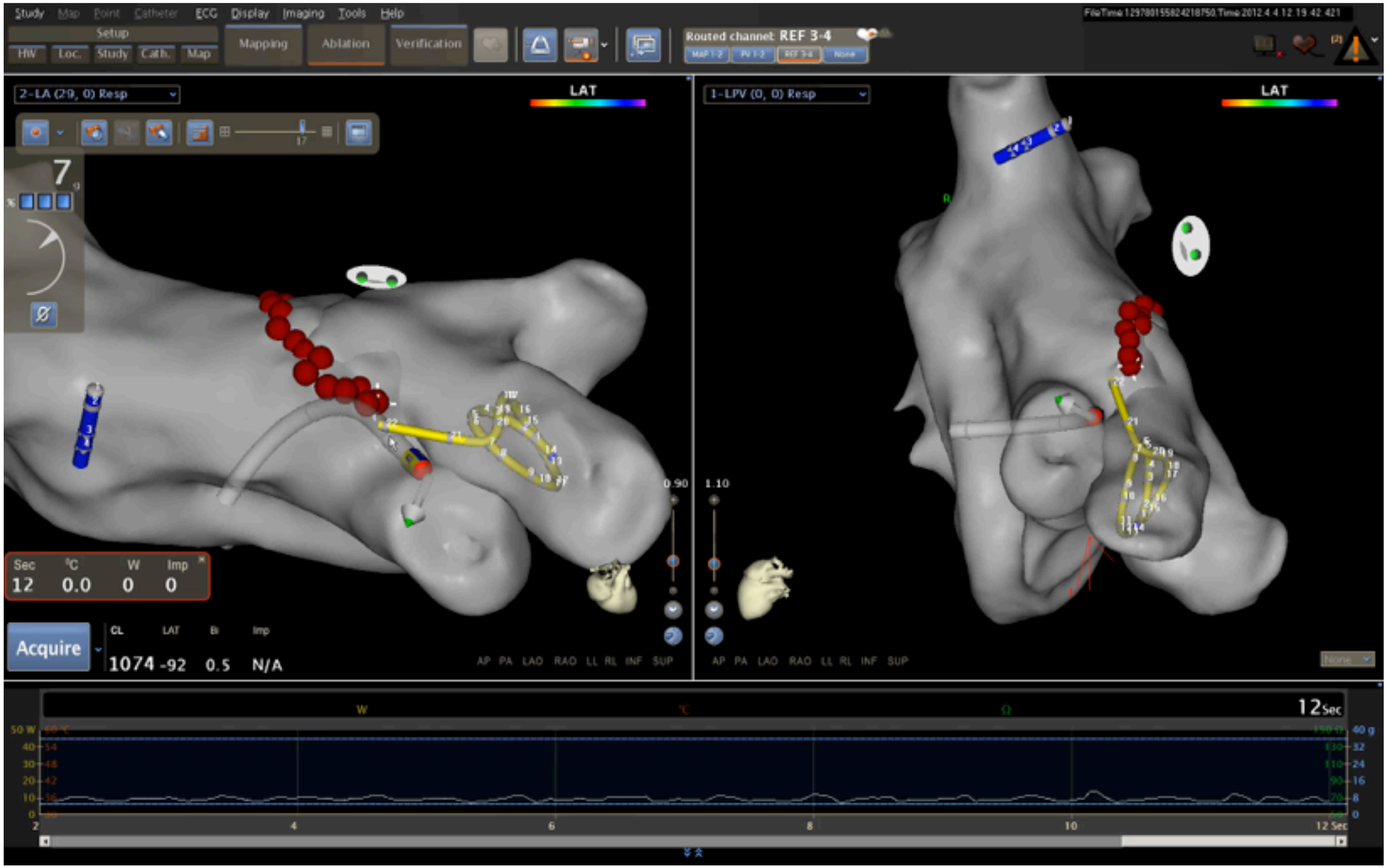
Vector

F/T graph



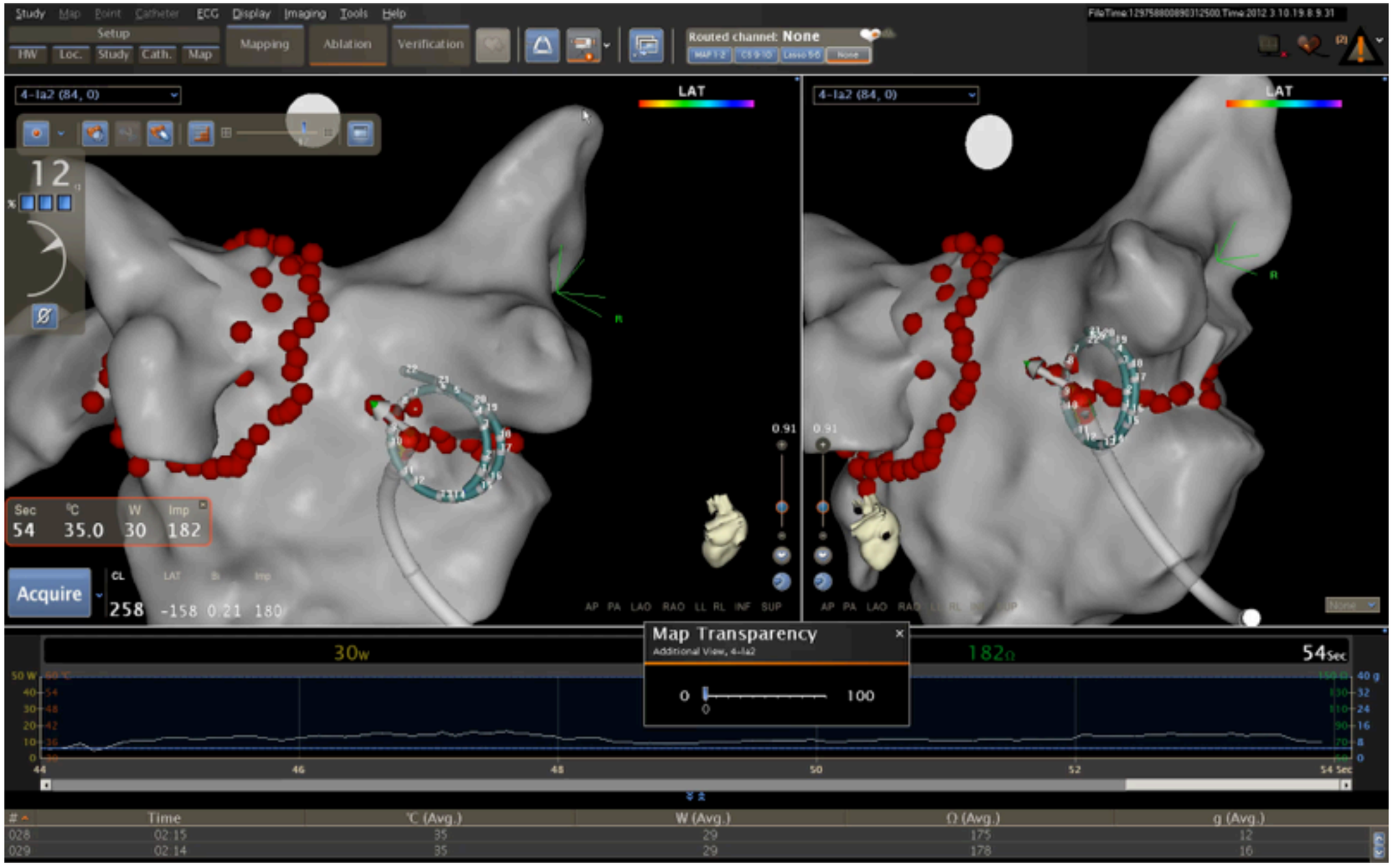
Smarttouch defines anatomy

- catheter on venous side of LAA/LPV



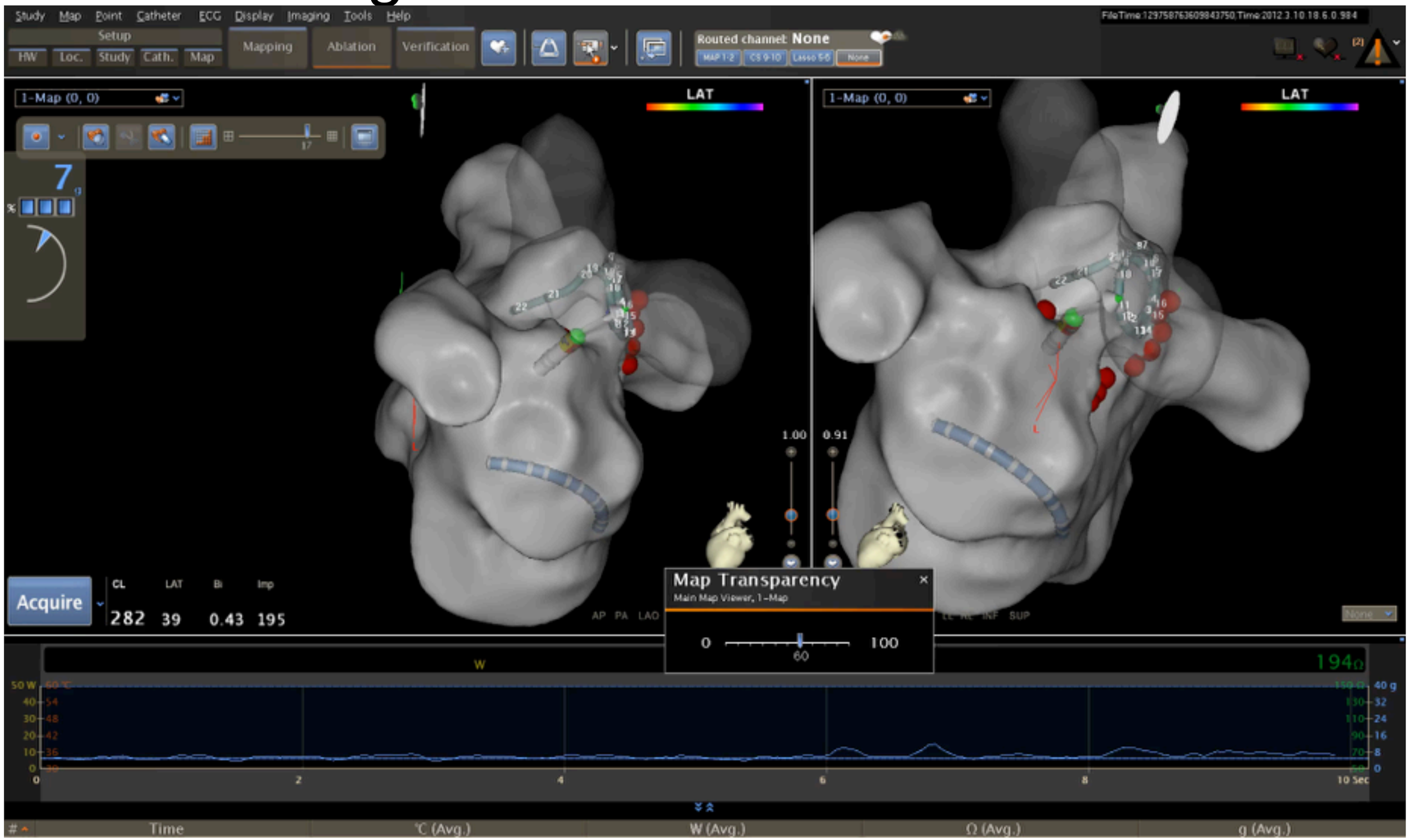
Smarttouch defines anatomy

- The true edge of the RLPV



Smarttouch defines anatomy

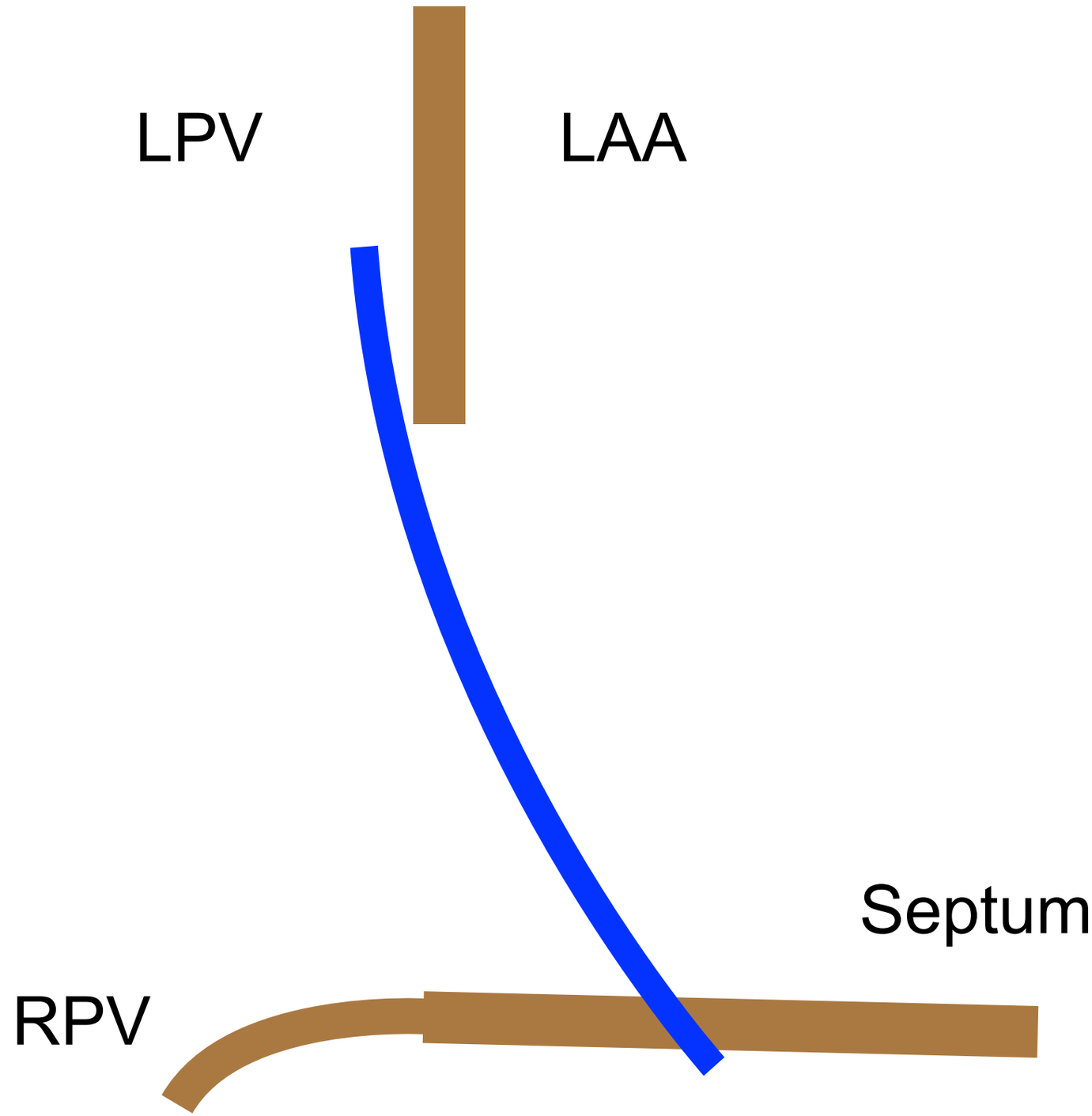
- LAA side of ridge



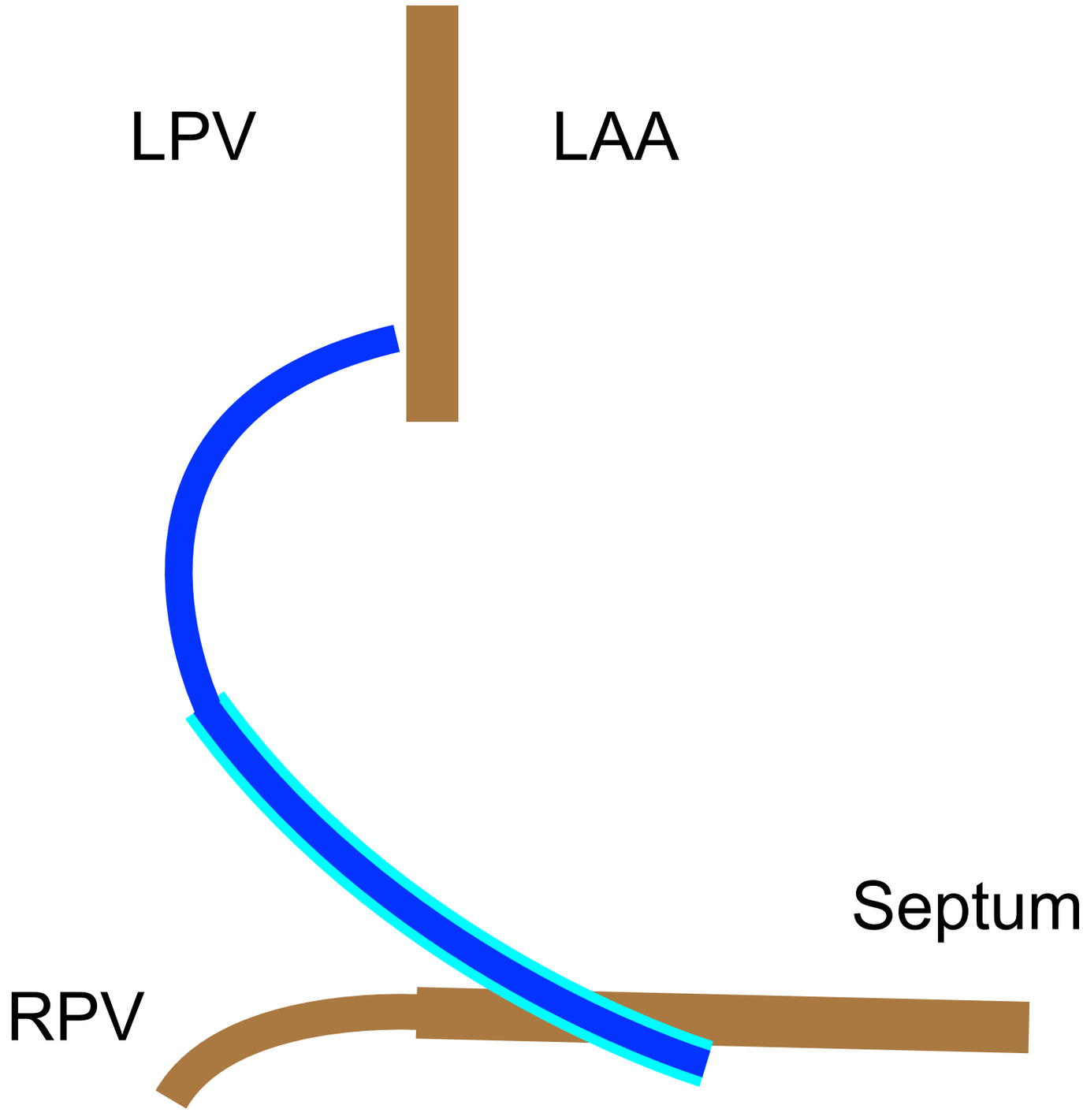
LAA/LPV ridge

- LPV side:
  - Catheter in contact but no force until tip flicks

Catheter in “contact”

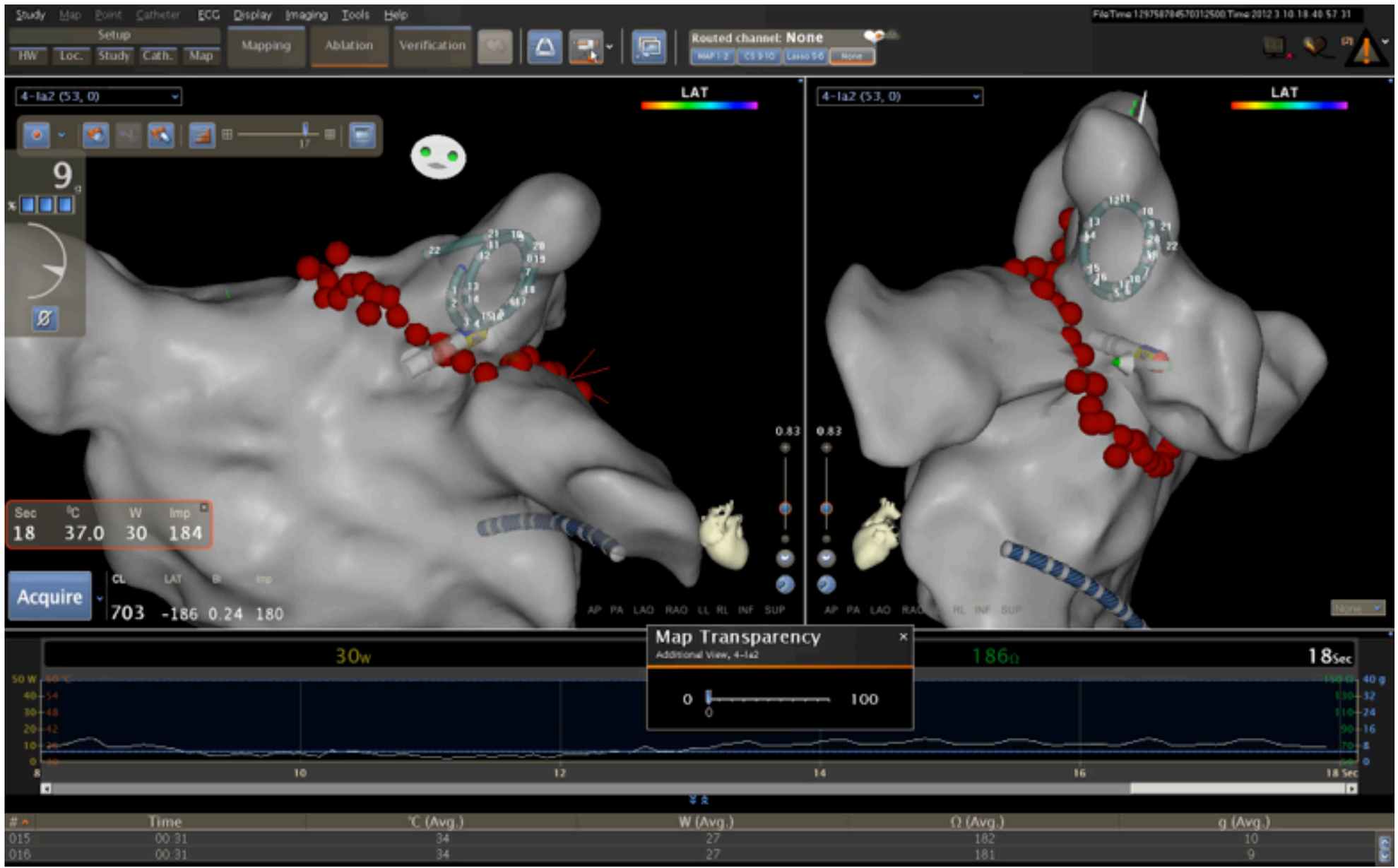


Use of the sheath for contact



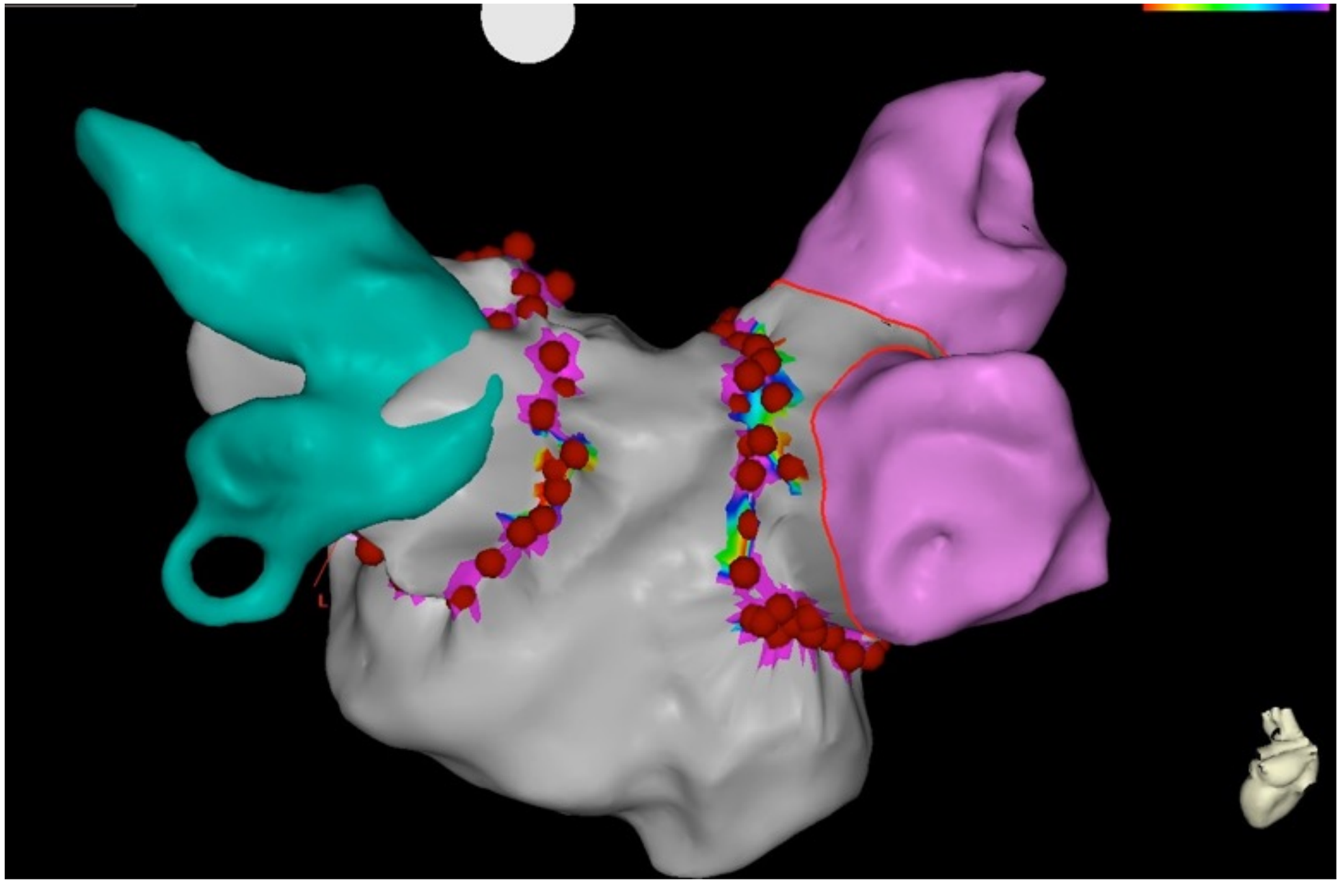
LAA/LPV ridge

- Orientation of sheath change:
  - Tip force now possible



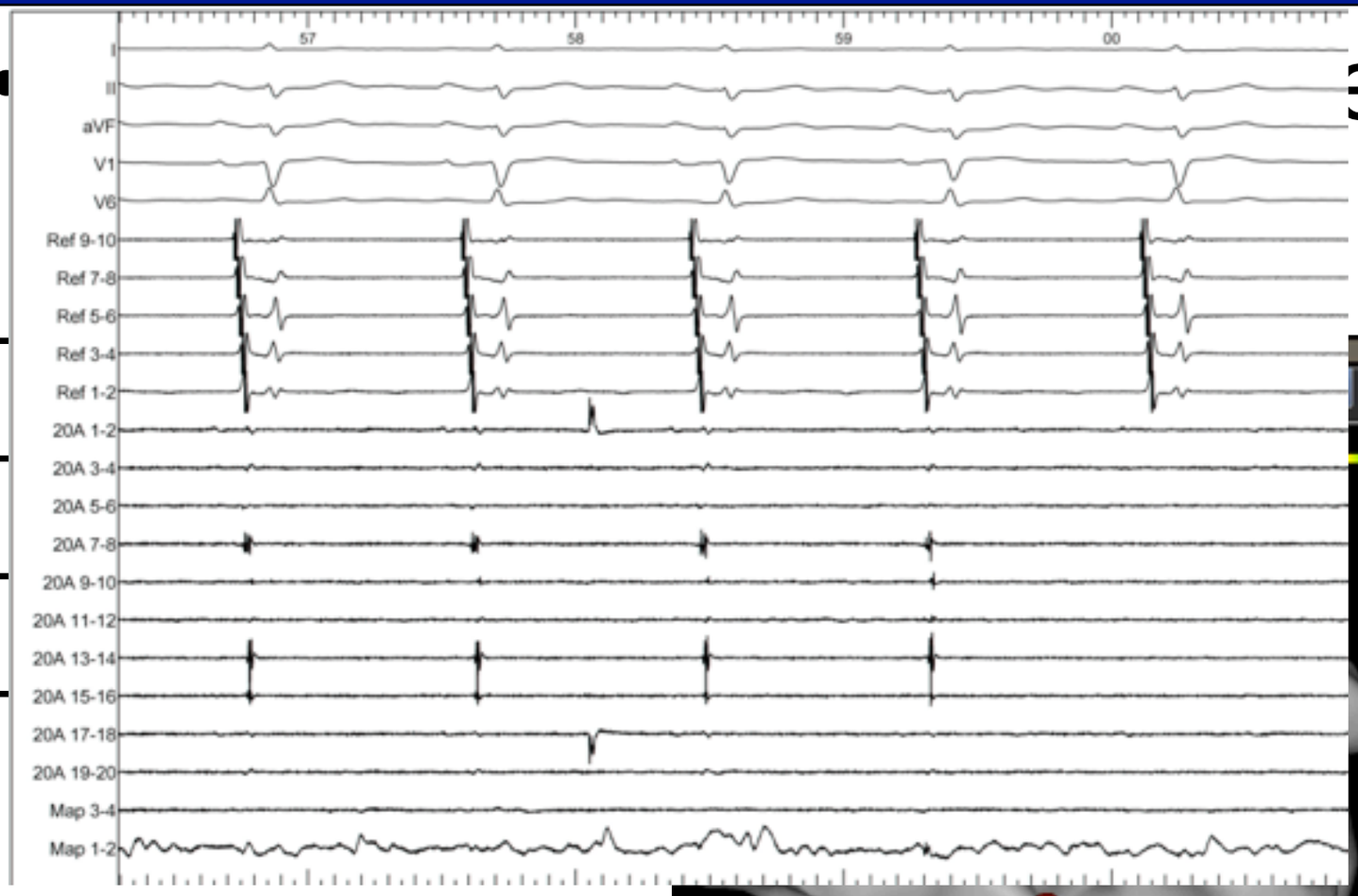
Force map

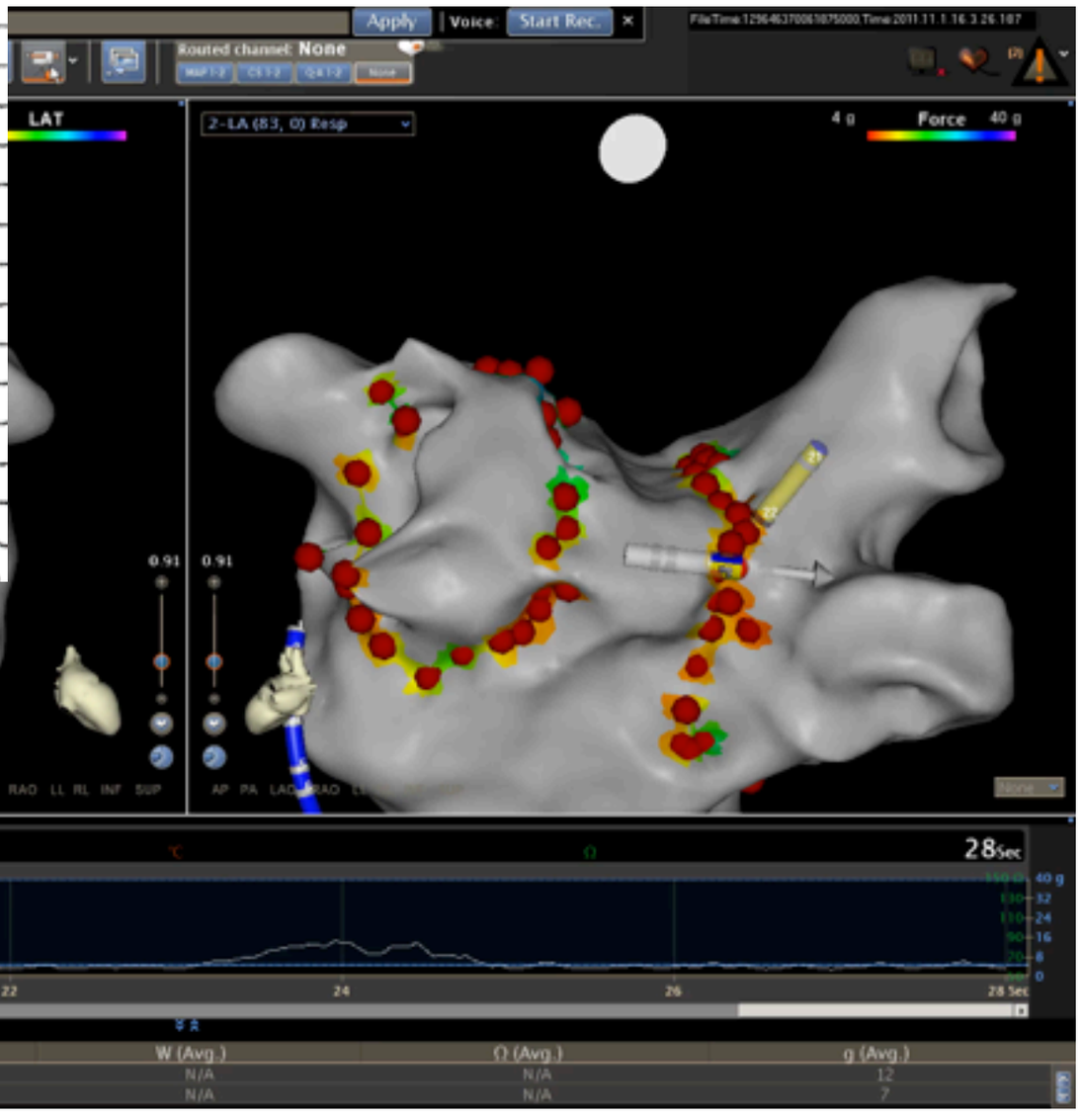
- Purple = adequate force



Force to identify breaks

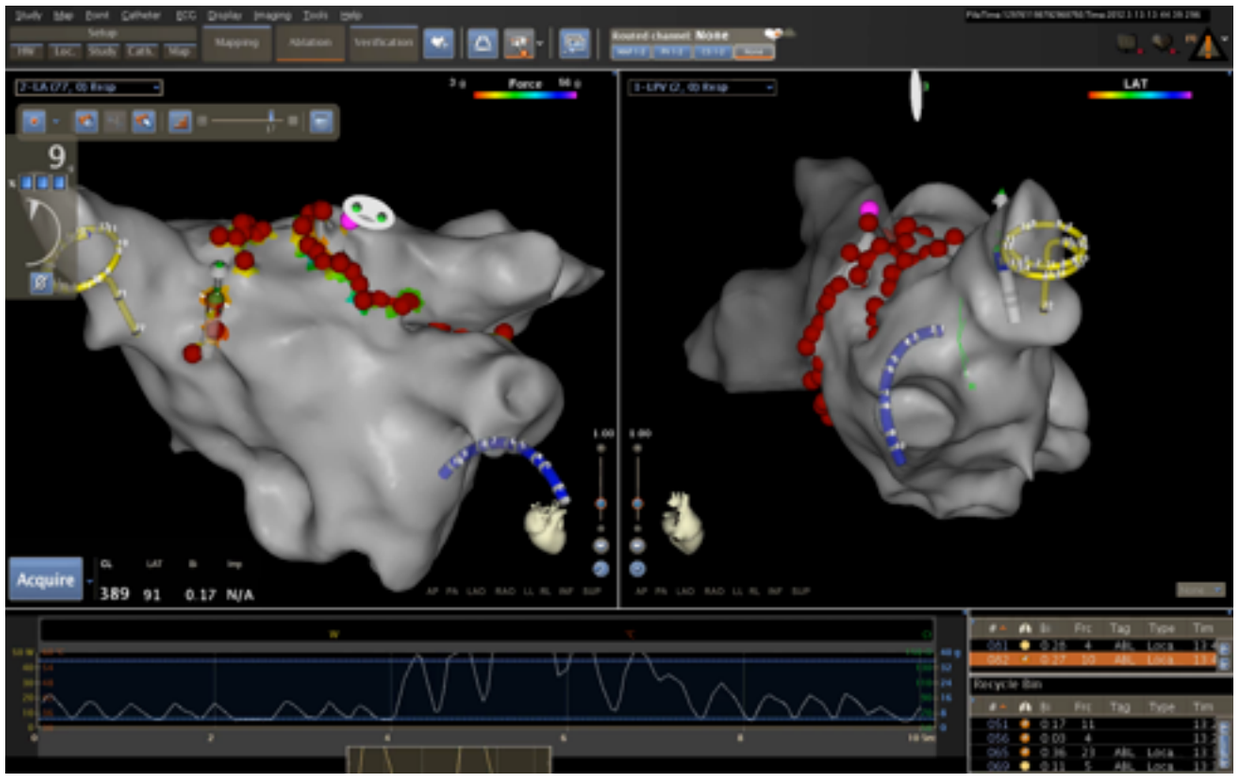
- e indicators of



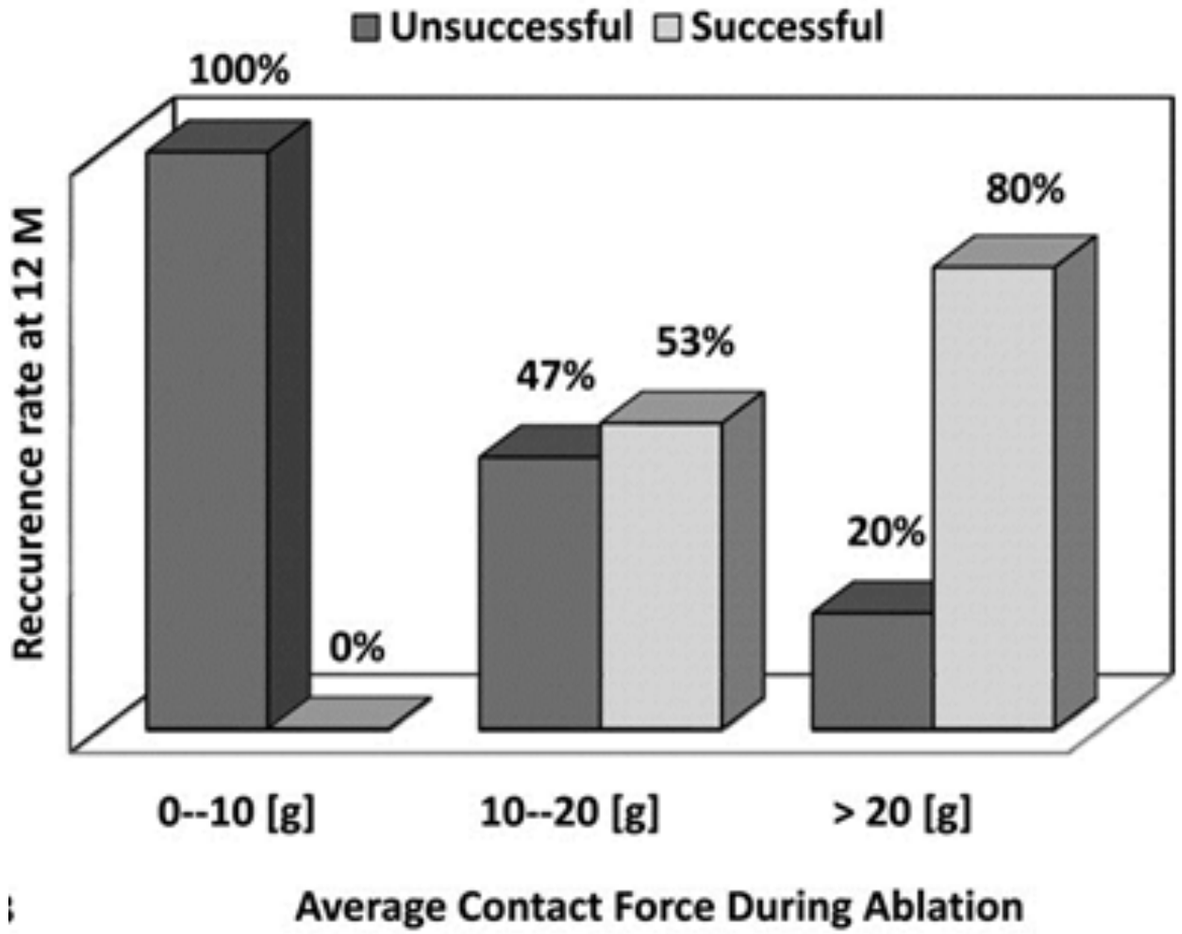


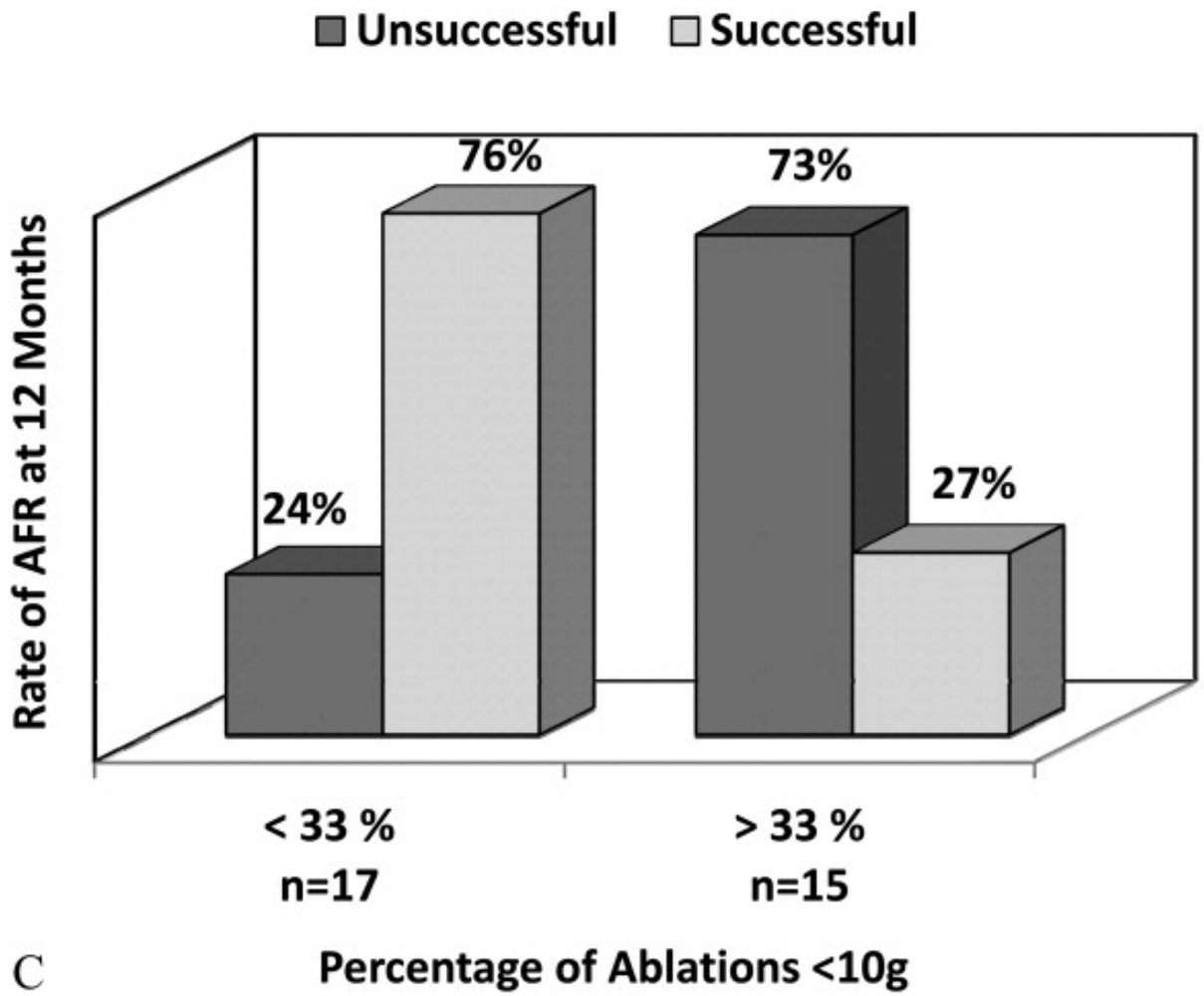
Safety with smarttouch

- The roof is a point of danger



Contact force and reconnection



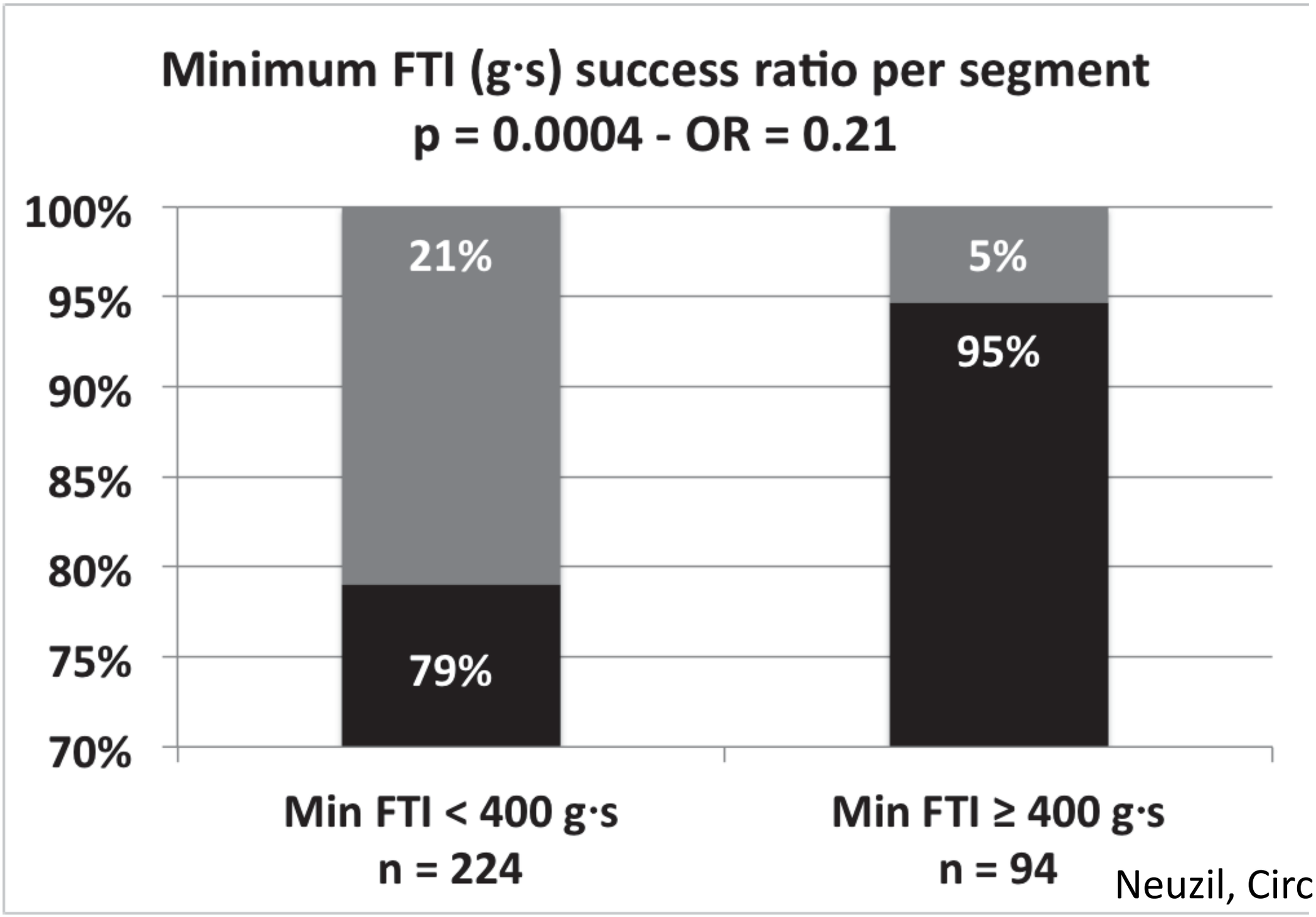


Reddy, Heart Rhythm 2012

Degree of contact and reconnection

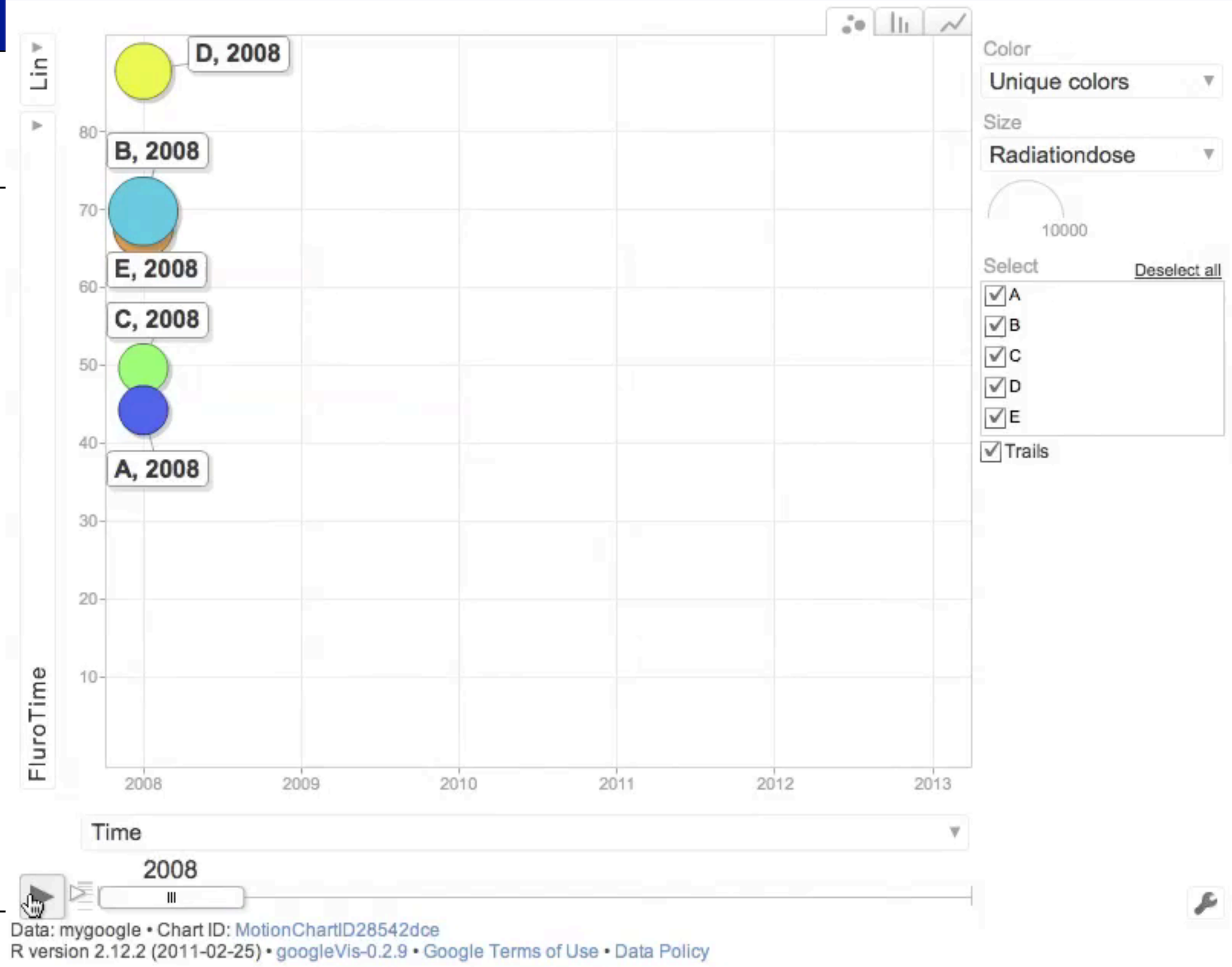
- N=46 PAF pts
- At 3 months
  - Median contact force lower for reconnecting PVI segments (15.5 vs 19.5g)
  - Minimum contact force and minimum FTI in segment most predictive

Neuzil, Circ AE 2013



Neuzil, Circ AE 2013

RJS AF case radiation exposure



Data: mygoogle • Chart ID: MotionChartID28542dce
R version 2.12.2 (2011-02-25) • googleVis-0.2.9 • Google Terms of Use • Data Policy

Lesion prediction

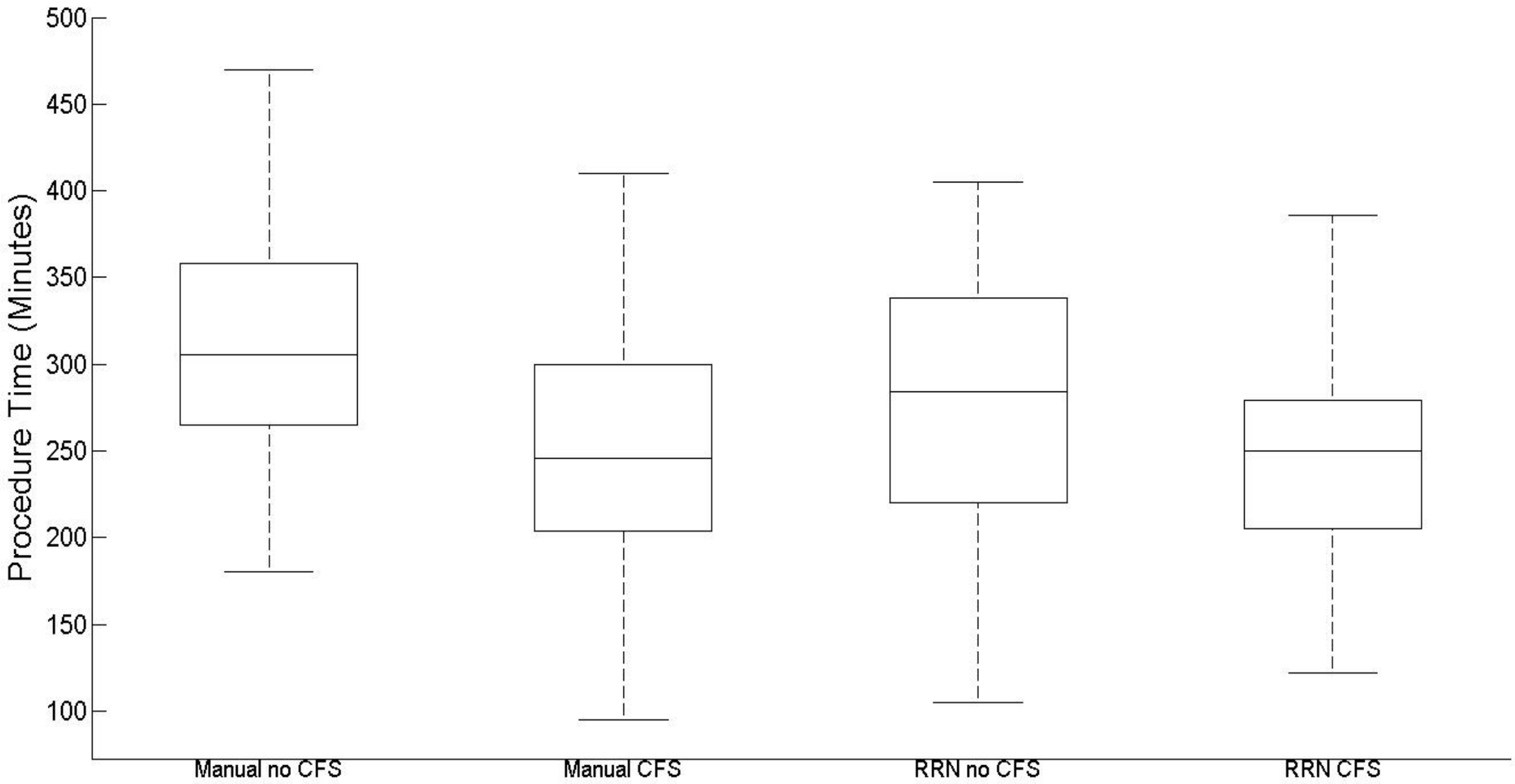
- 15 PeAF patients
- 348 static 30s ablations (PVI and CFAE)
- Impedance sampled at 10Hz
- Contact Force sampled at 20Hz
- Impedance drop to interval FTI

Integration with other technologies

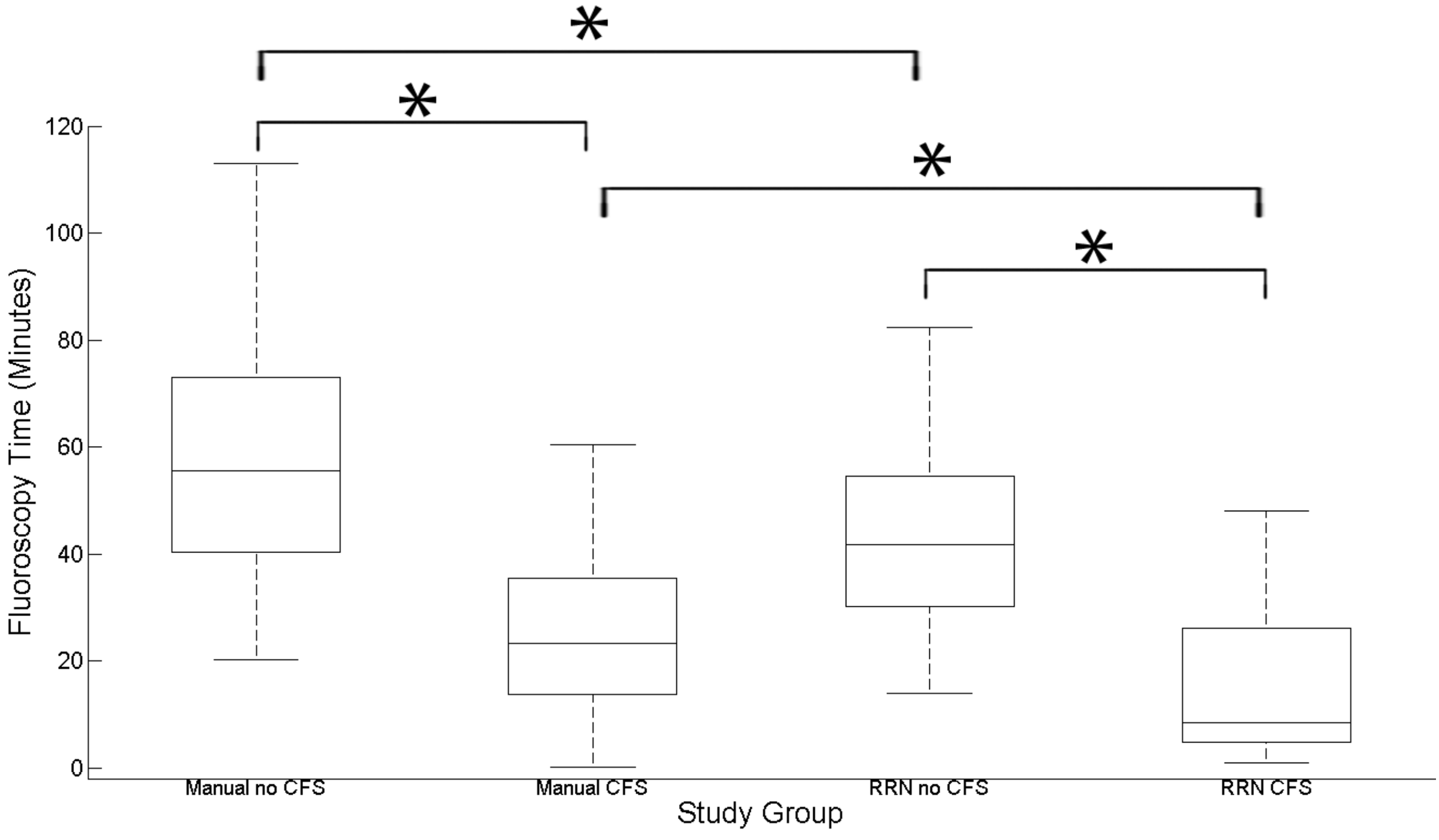
- Case cohort study of robotic (Hansen) guided mapping and ablation of persistent AF
- 4 groups of 50 patients
  - –Manual + CFS
  - –Robot + CFS
  - –Manual Ablation
  - –Robotic Ablation

	All Patients	Manual no CFS	Manual with CFS	RRN No CFS	RRN with CFS	p-value
Number	200	50	50	50	50	
Male Gender (%)	163 (82%)	40(80%)	41 (82%)	37(74%)	45 (90%)	0.22
Age in years, median(range)	61 (29-82)	61 (38-82)	62(29-80)	60 (33-78)	60 (42-76)	0.5
Duration NPAF in months – Time in continuous AF, median(range)	10 (0-60)	12 (0-60)	12 (1-60)	9 (0-60)	9 (0-60)	0.83
LA Diameter (mm±SD)	4.4±0.7	4.5±0.8	4.4±0.6	4.5±0.6	4.3±0.9	0.68
Hypertension (%)	61 (31%)	12 (24%)	21 (42%)	13 (26%)	15 (30%)	0.2
Coronary Artery Disease (%)	29 (15%)	4 (8%)	8 (16%)	9 (18%)	8 (16%)	0.5
Cerebrovascular Disease (%)	9 (5%)	5 (10%)	1 (2%)	1 (2%)	2 (4%)	0.17
Diabetes (%)	19 (10%)	5 (10%)	5 (10%)	6 (12%)	3 (6%)	0.78
Severe Left Ventricular Impairment, EF<35% (%)	10 (5%)	1 (2%)	2 (4%)	4 (8%)	3 (6%)	0.5
CHADSVASC Score mean±SD	1.3±1.2	1.3±1.3	1.5±1.2	1.3±1.2	1.1±1	0.49

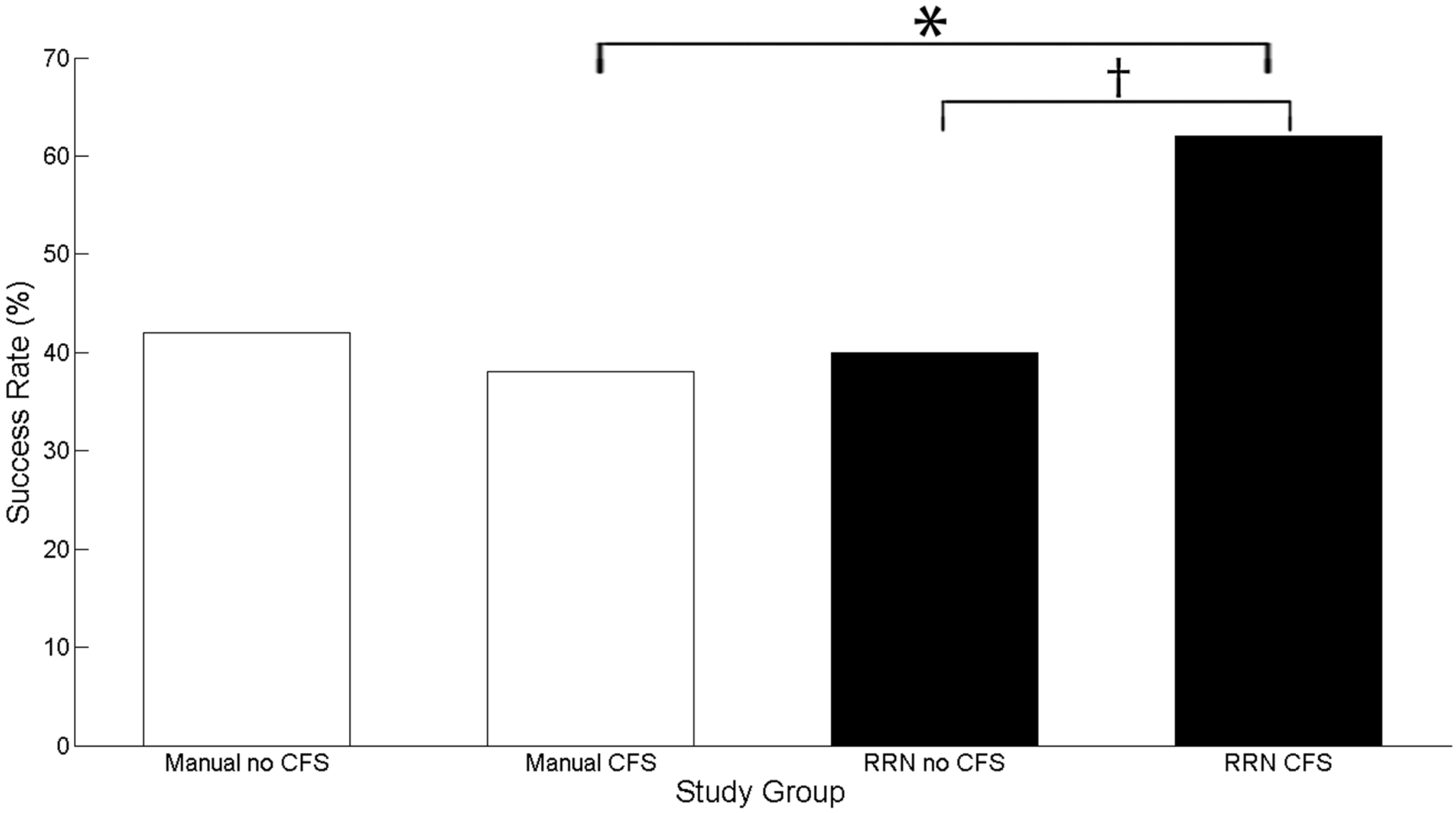
Procedure times



Fluoroscopy times



Single procedure 6 month success



	Manual no CFS	Manual CFS	RRN no CFS	RRN CFS
Minor Complications	0	1 (2%) Pericardial Effusion	4 (8%) 3 Pericardial Effusions, 1 Haematoma	3 (6%) Pericardial Effusions
Major Complications	2 (4%) Haematoma, Tamponade	2 (4%) Pseudoaneurysm, Phrenic nerve palsy	0	0

Conclusion

- Smarttouch provides reliable, accurate force sensing
- Additional sense for the interventional electrophysiologist
- Improved procedural metrics
- Clinical benefit if stable adequate FTI
- With ↑ power comes ↑ risk
- Consistent rather than greater power