



Triumphs and disasters in the EP lab

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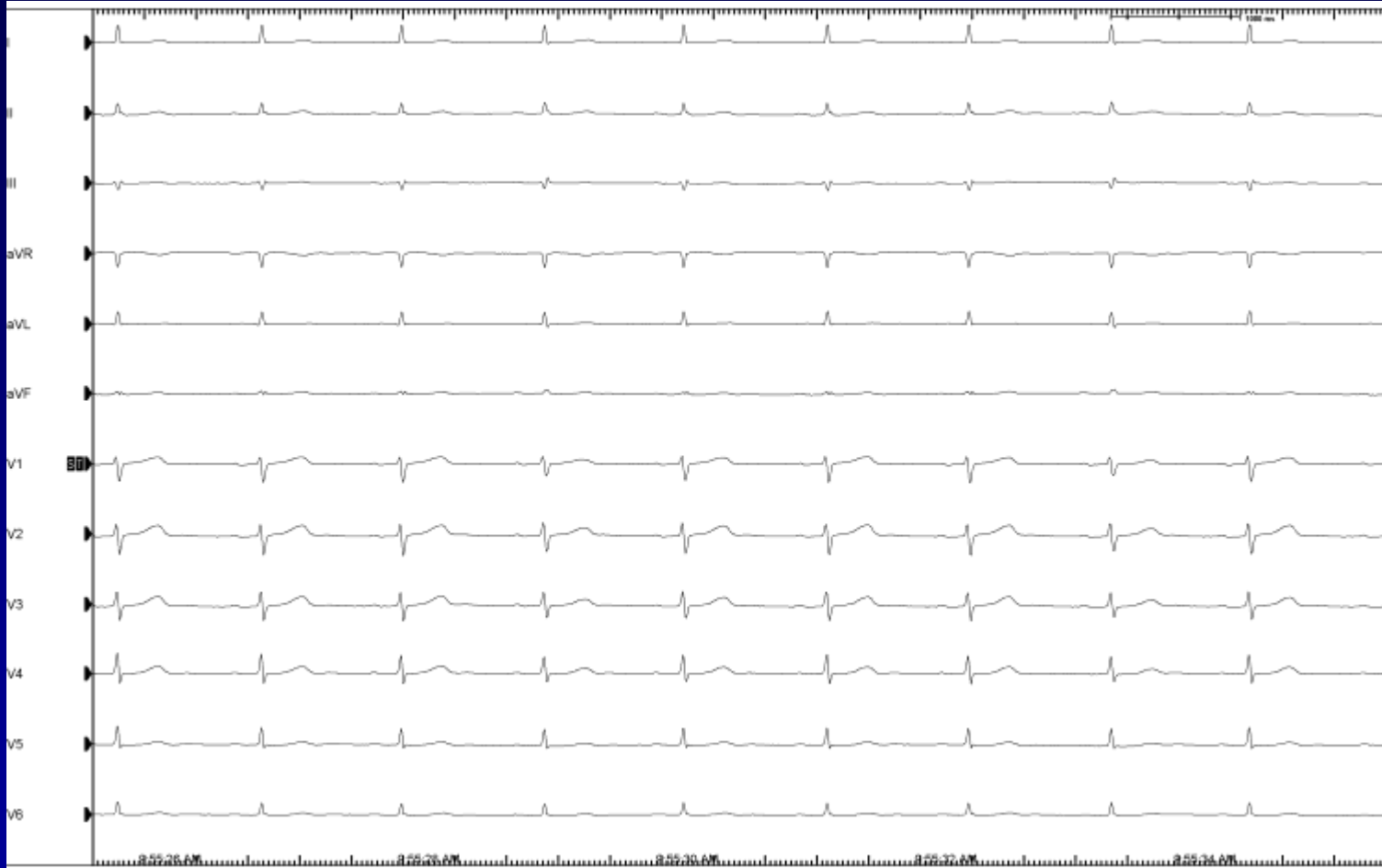
Case 1

- 71 Male
- 4 year history of Atrial fibrillation
- Obese
- Hypertensive
- Previous open repair of infrarenal aortic aneurysm

Plan

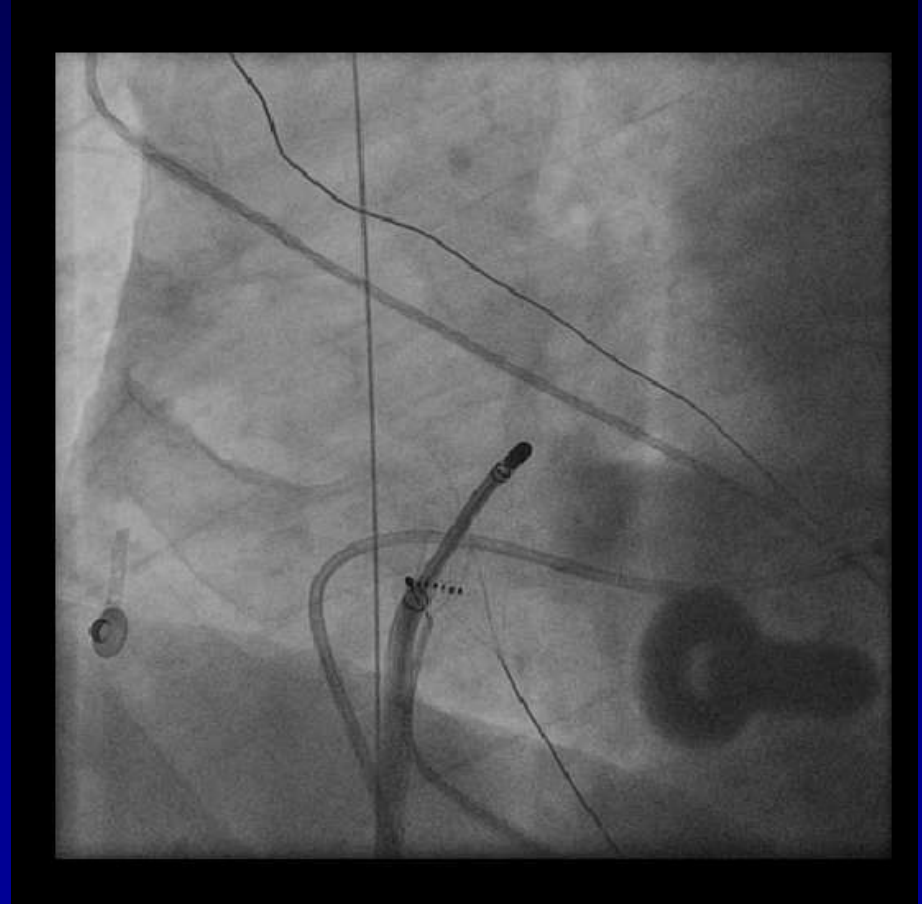
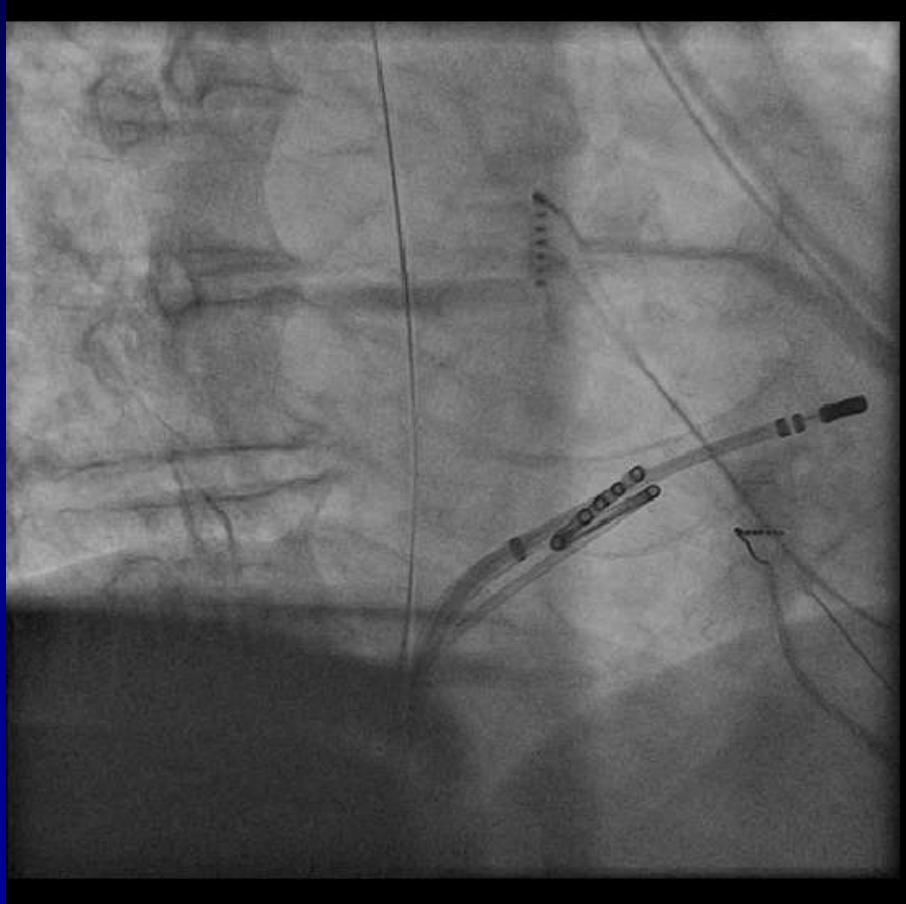
- Sinus Rhythm
 - HR 83 BP 150/110
- Wide area circumferential ablation
- Carto 3
- Sedation
- 3 Sheaths in the Right Femoral Vein
- Two SL1 sheathes

ECG



BP 110/70

Initial set-up prior to transeptal



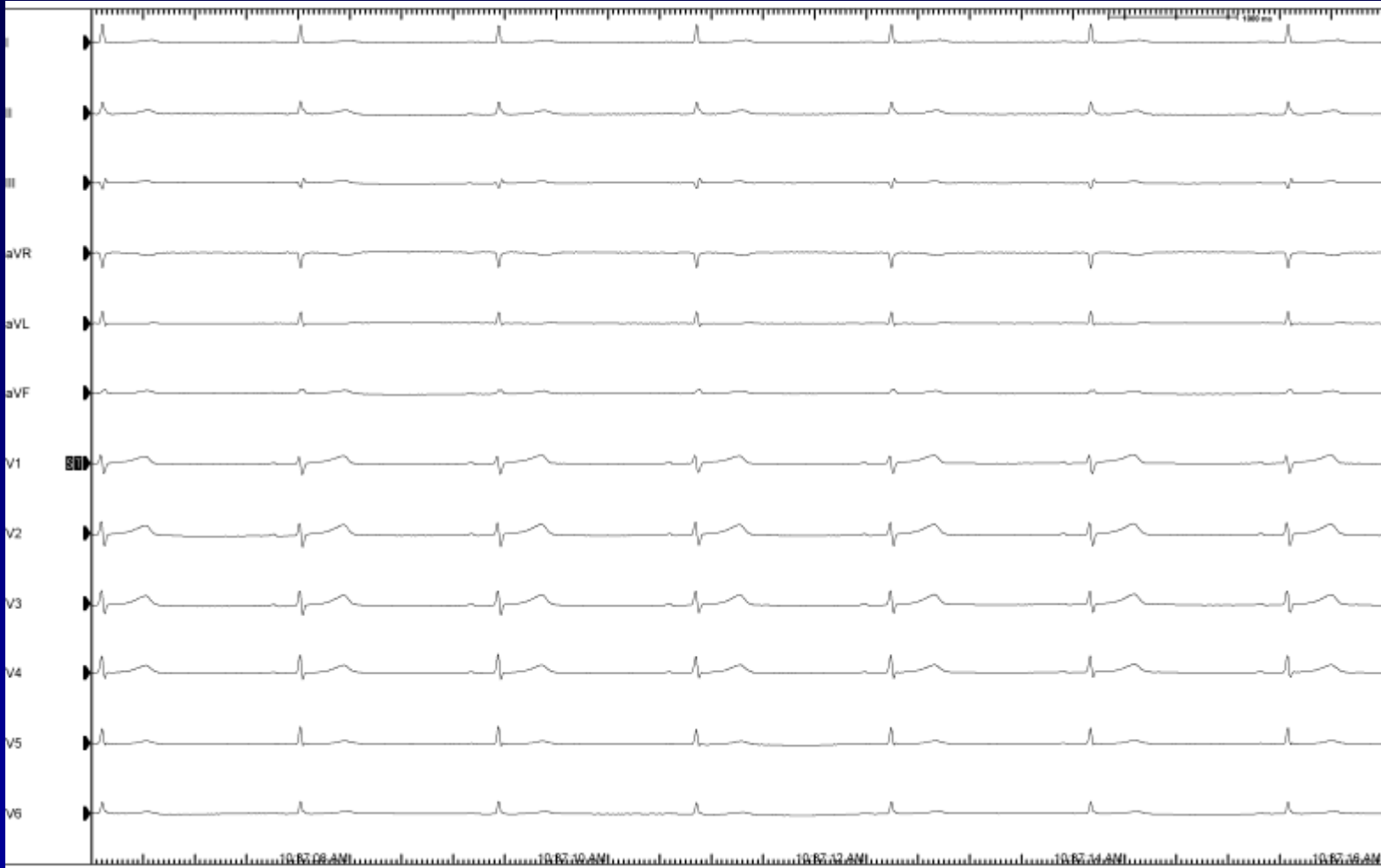
Started Transeptal

- Initial Pull back straight forward
- Tenting Septum

Heart rate 45

Blood pressure 85/68

Repeat Measurements



Heart rate: 40

Blood Pressure: unrecordable

What is going on??

- Vagal
- Tamponade
- Air embolus
- Anaphylaxis
- Bleed

Plan B

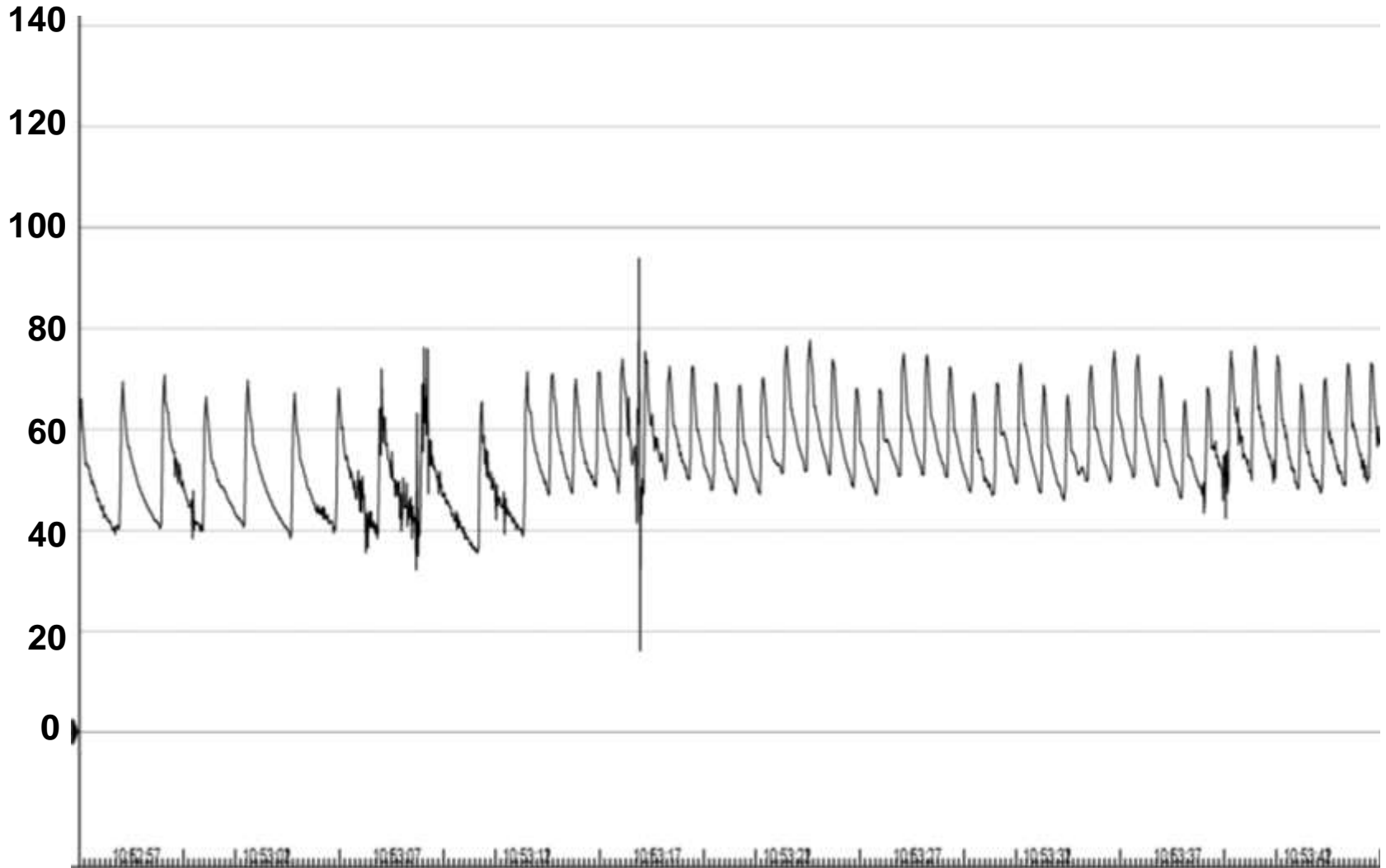
- Atropine
- Chlorpheniramine
- Fluids
- Emergency ECHO
- Arterial Line
- More local anaesthetic

ECHO

No effusion

Reasonable LV function

BP response



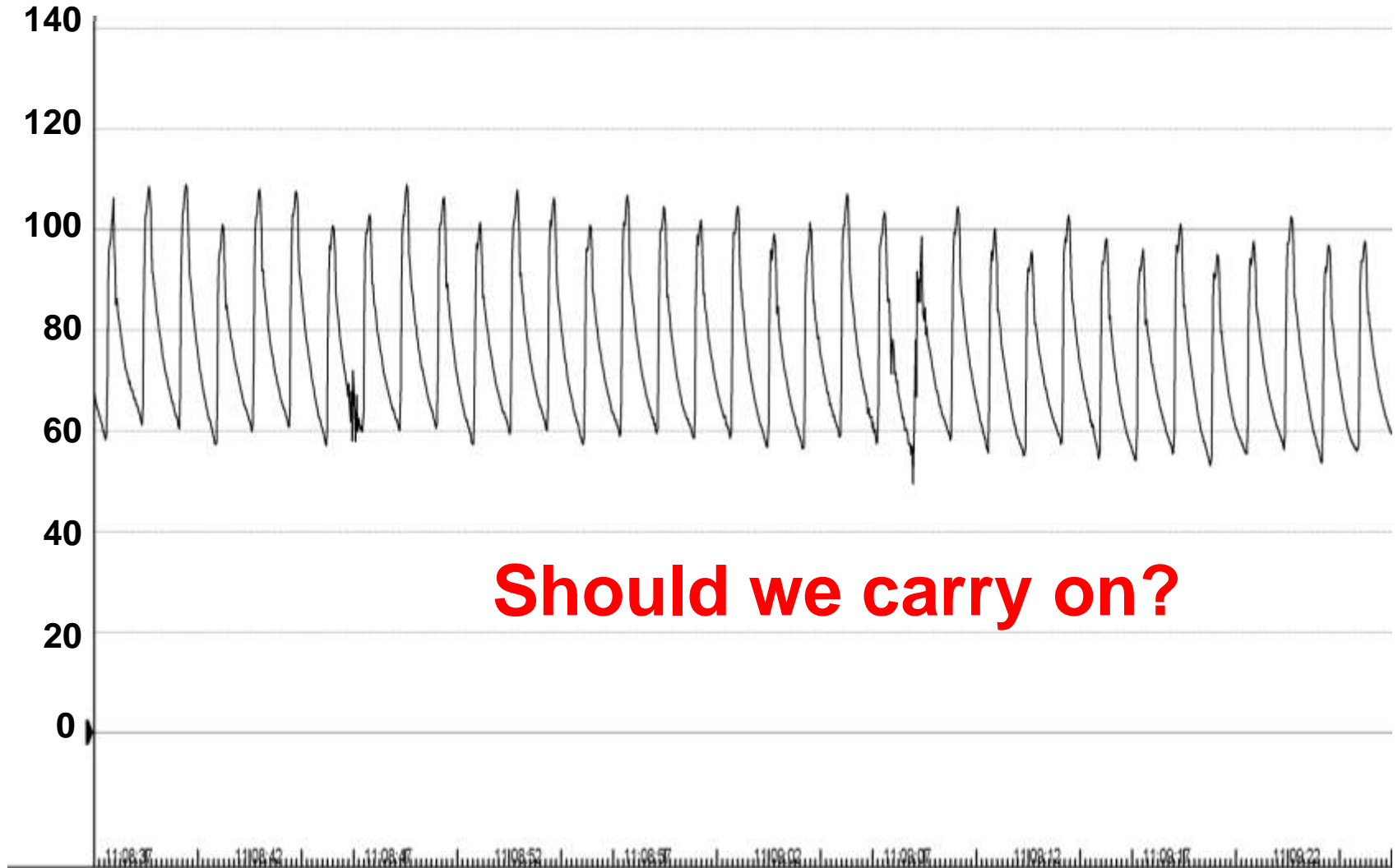
What now?



What now?



2 minutes later

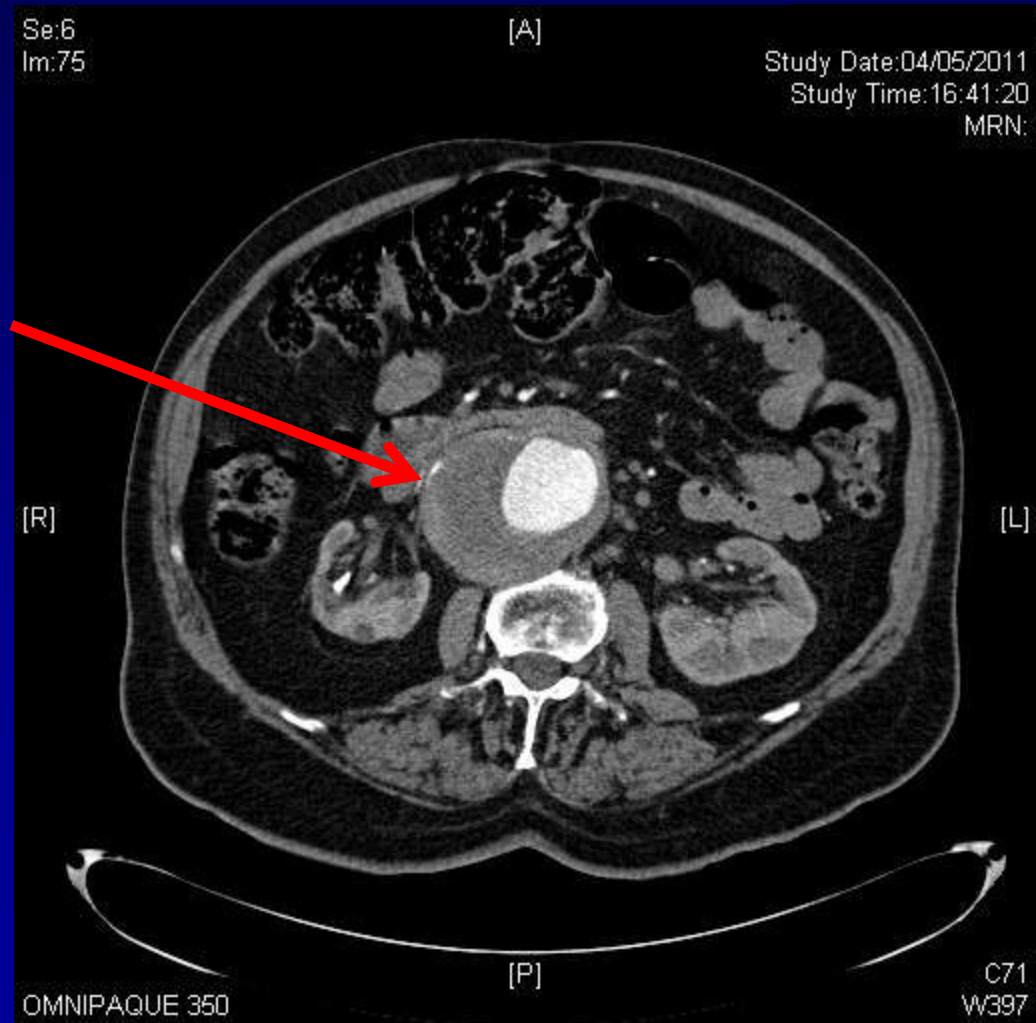


Back to CCU

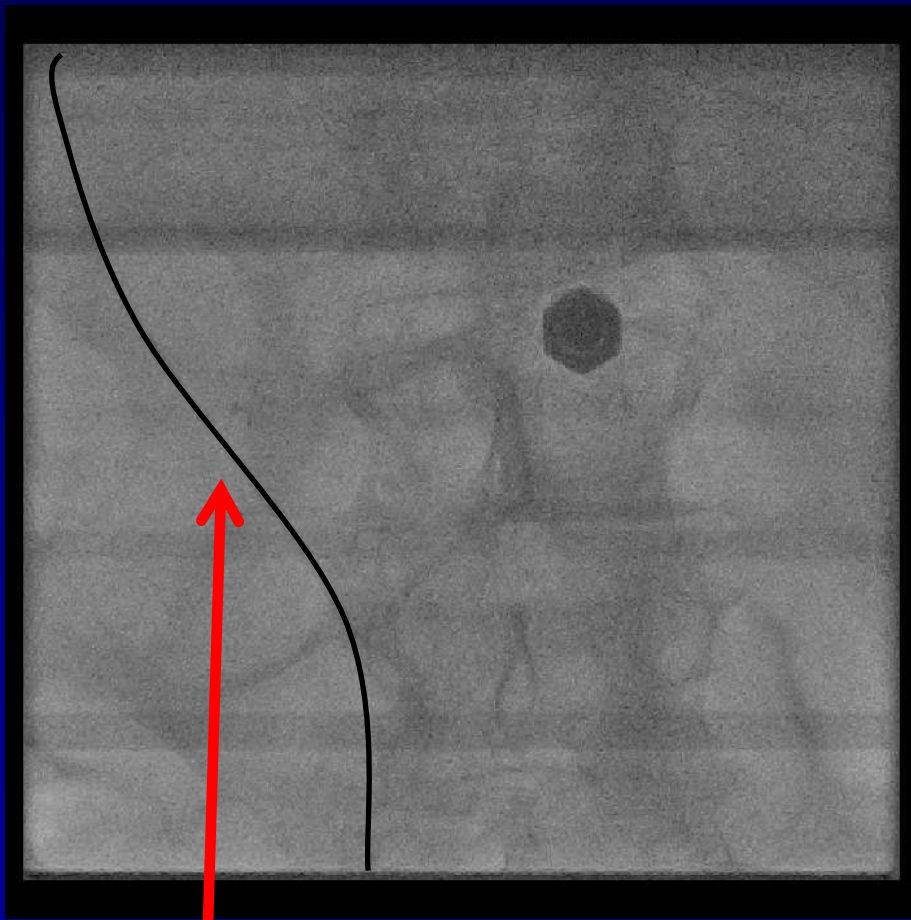
- CT scan to exclude retroperitoneal bleed
- Well but ongoing sinus bradycardia

No retroperitoneal Bleed

7.3cm x 12.4cm
Supra renal aortic aneurysm



In retrospect



CS catheter bending
around Aortic
aneurysm

Conclusion

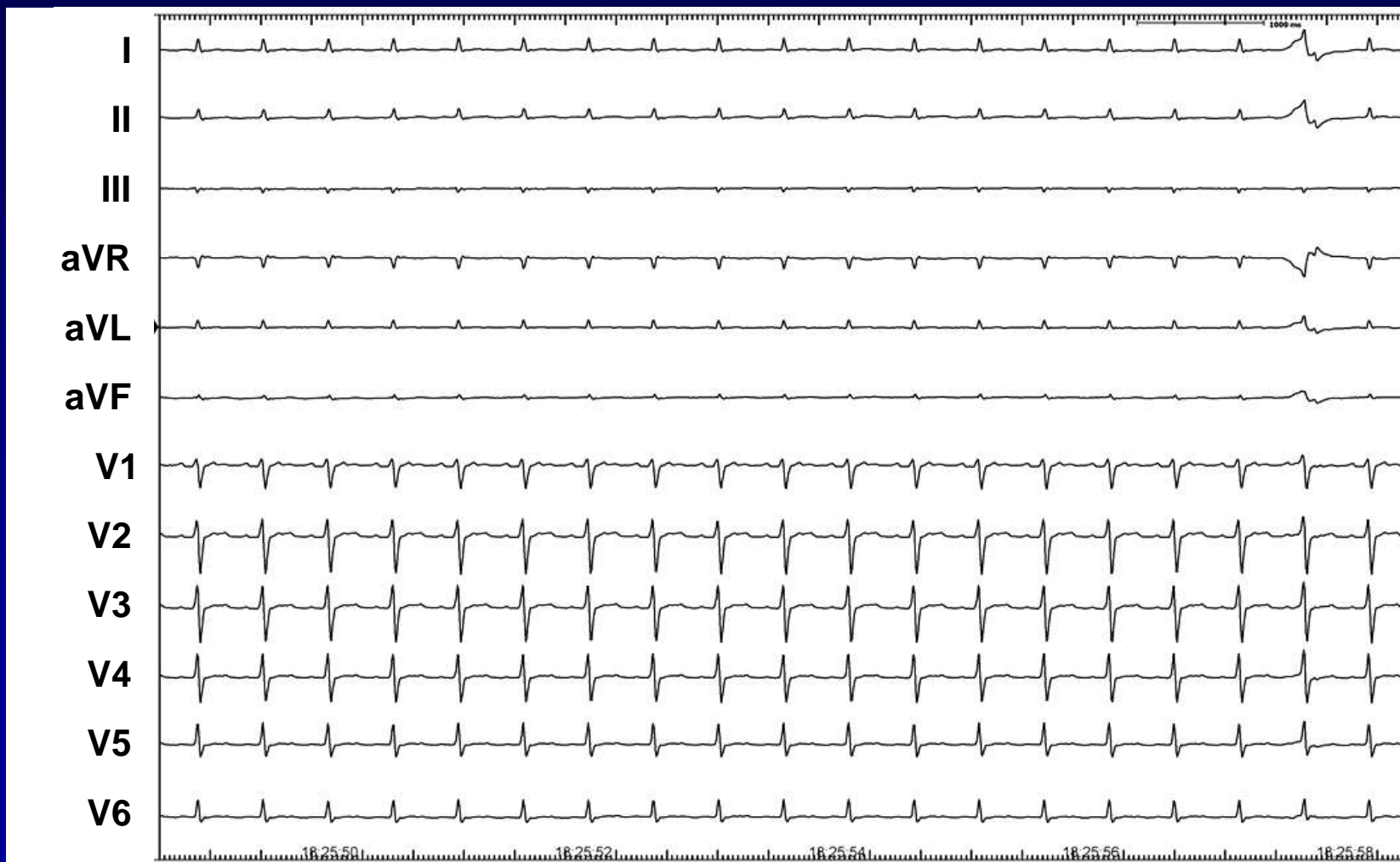
- Profound vagal response to displacement of a massive aneurysm by stiff transeptal sheathes
- Referred for urgent endovascular repair

Severe bradycardia in a patient undergoing endovascular stent-graft repair for abdominal aortic aneurysm with vena cava balloon occlusion.
Sato Y et al. Can J Anaesth. 2003 Nov;50(9):970-1.

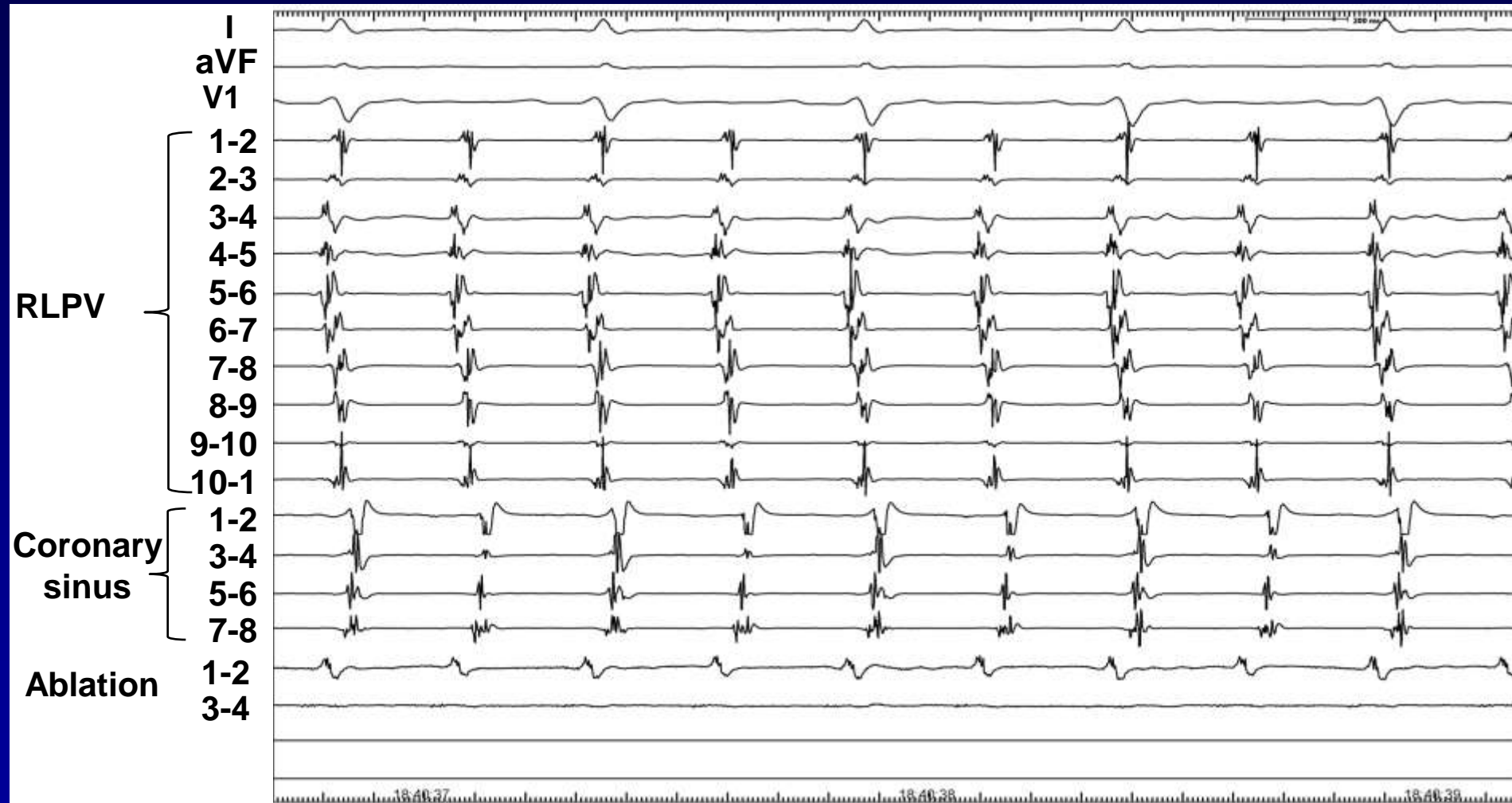
Case 2

- Highly symptomatic 55 male
- 2 prior ablations for persistent AF
 - Ablation 1: Wide area circumferential ablation (WACA) + Complex fractionated electrograms
 - Ablation 2: Reisolate veins + CFAE + roof and mitral isthmus line
- Persistent atrial tachycardia

Initial ECG

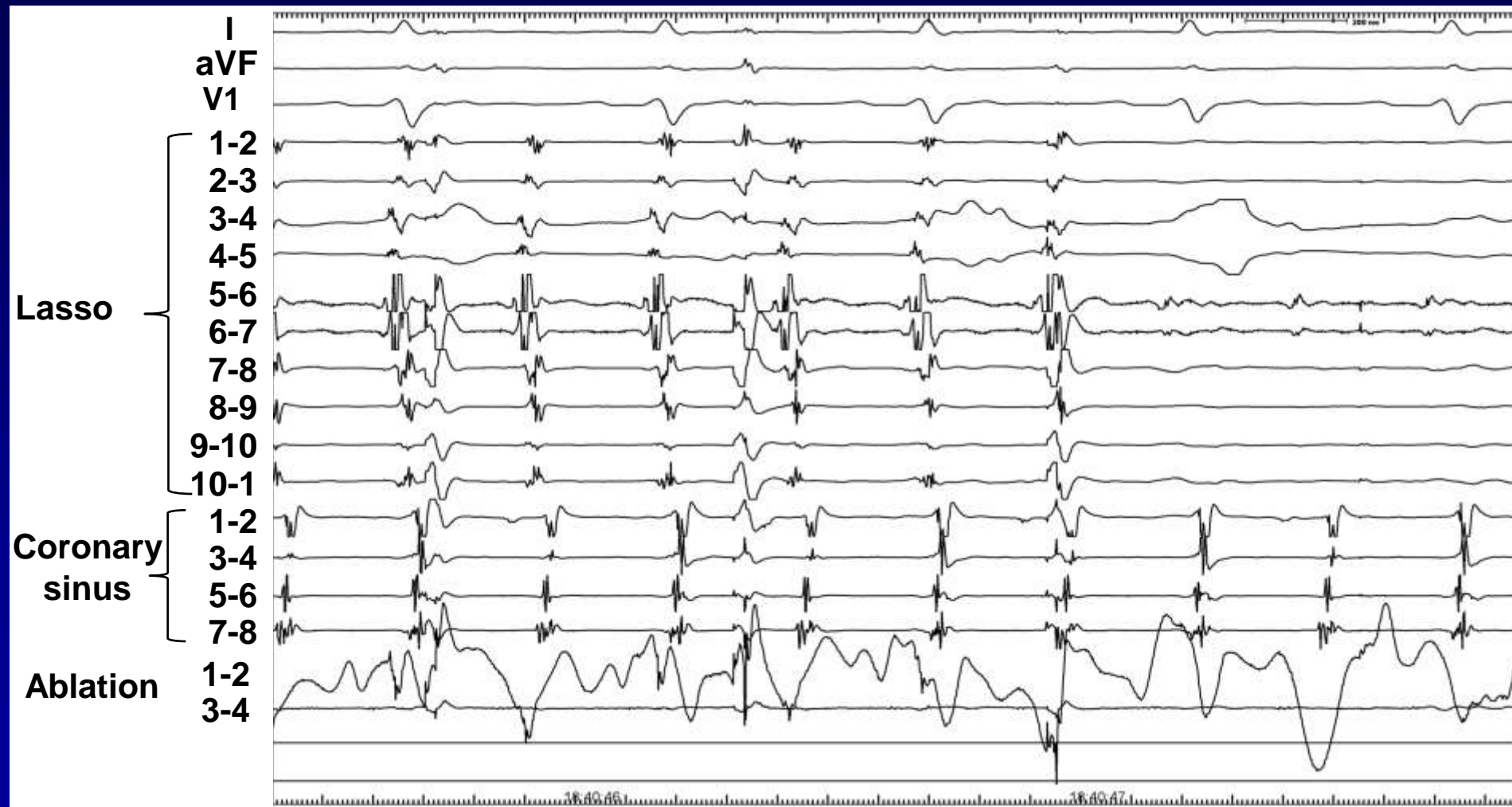


Initial electrograms

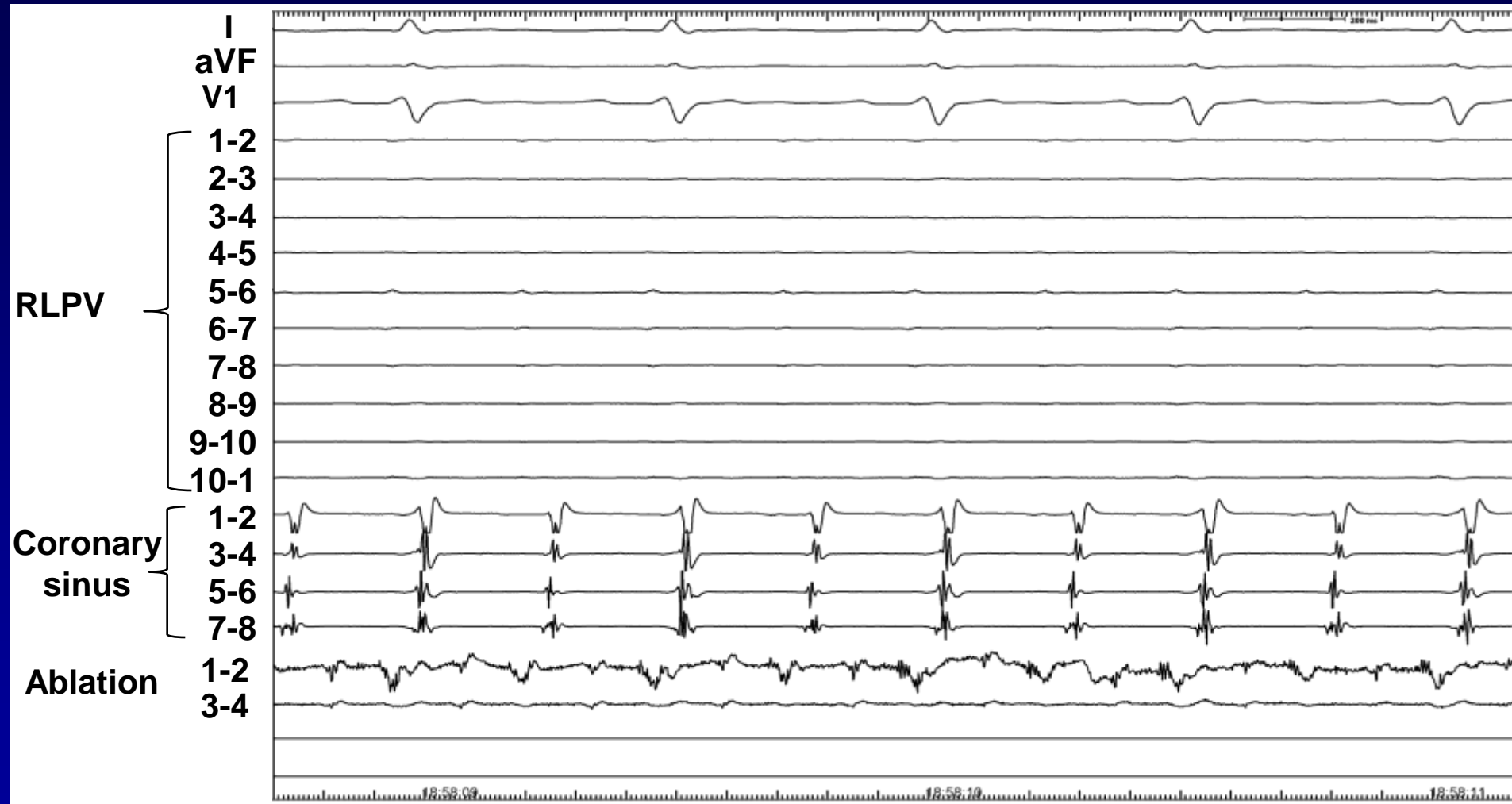


Lasso in Right Lower Pulmonary Vein (RLPV)

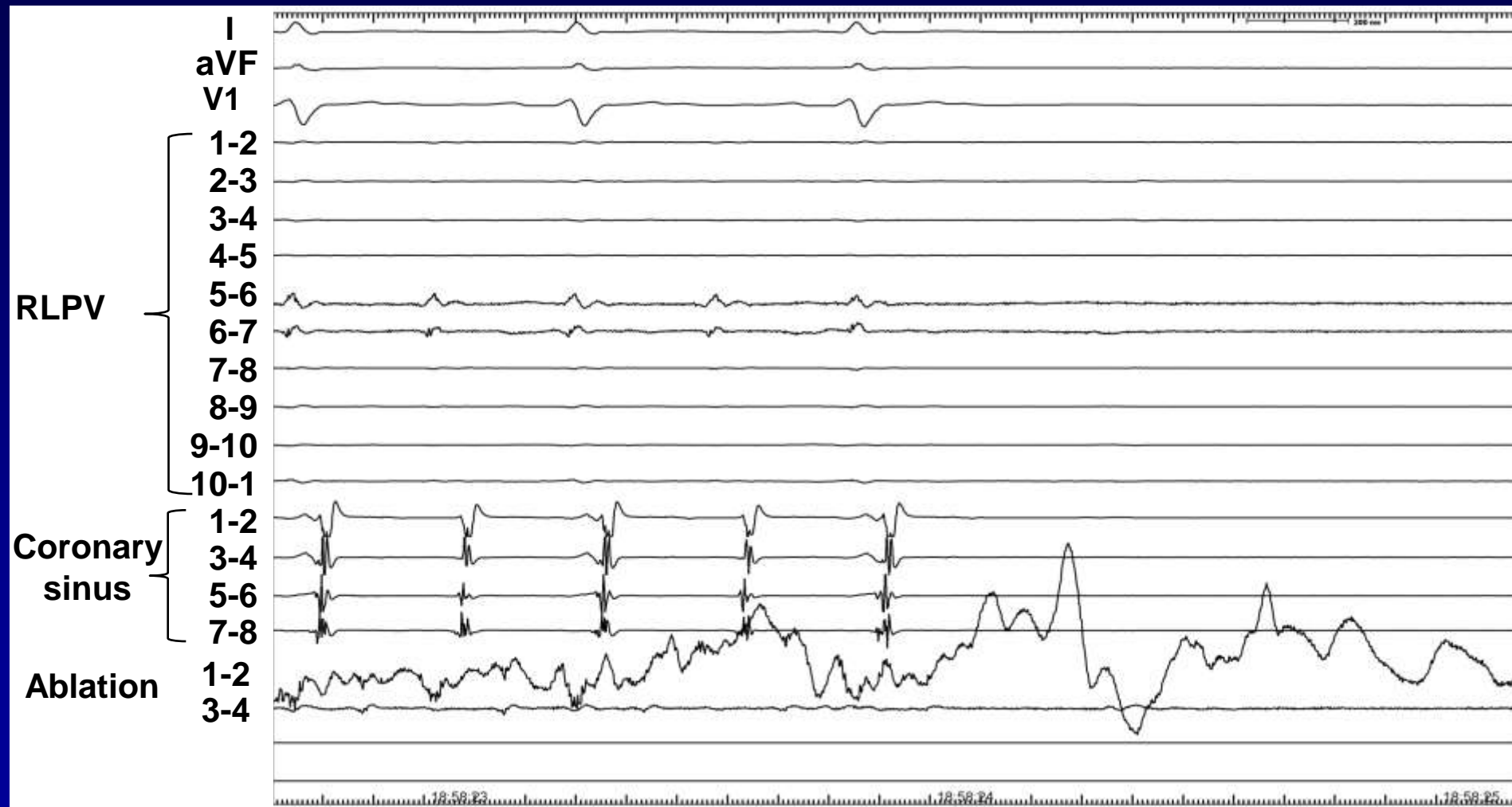
RLPV isolated



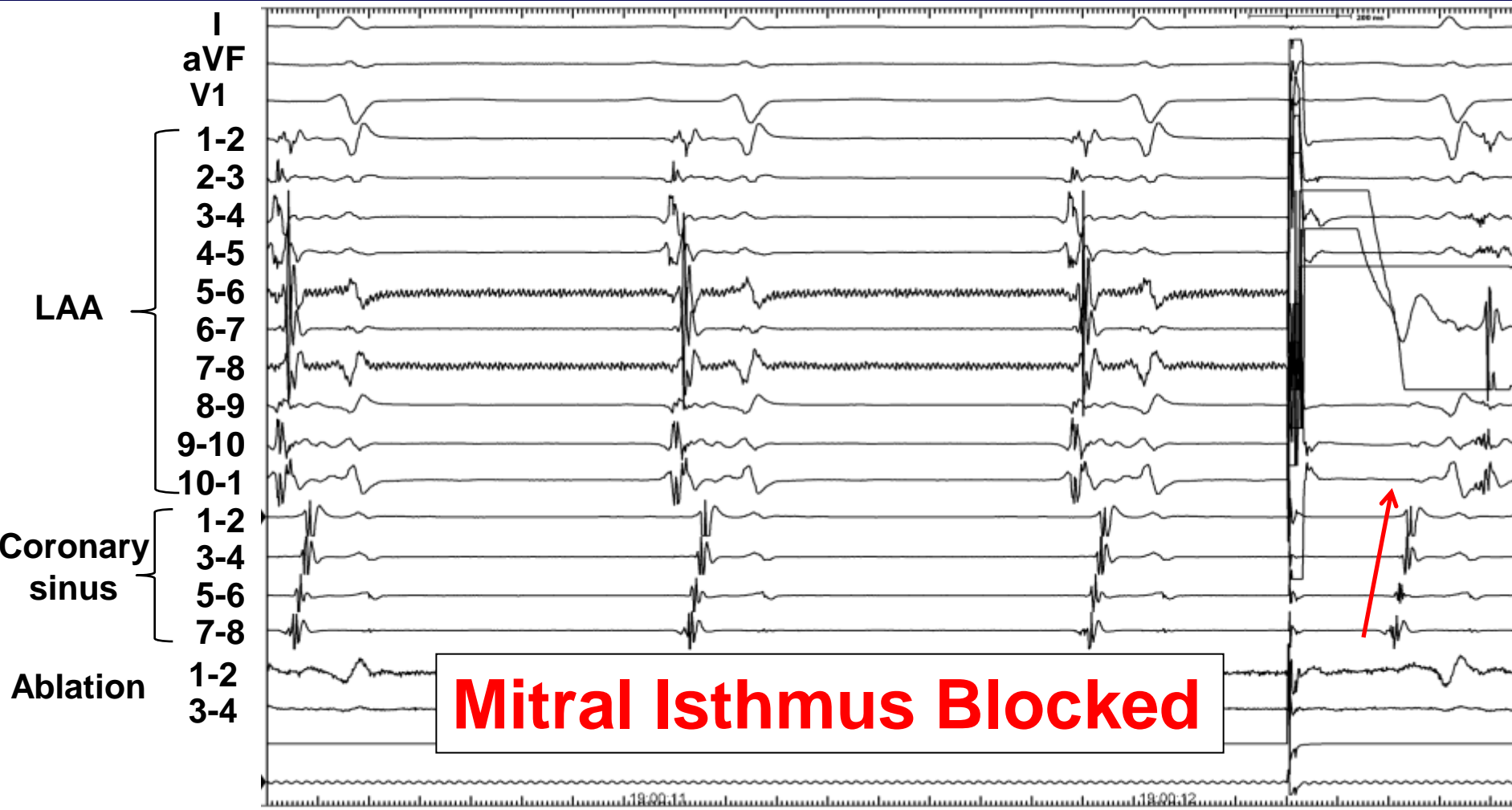
Good signal on the back wall



Termination of initial tachycardia



Checking the mitral isthmus

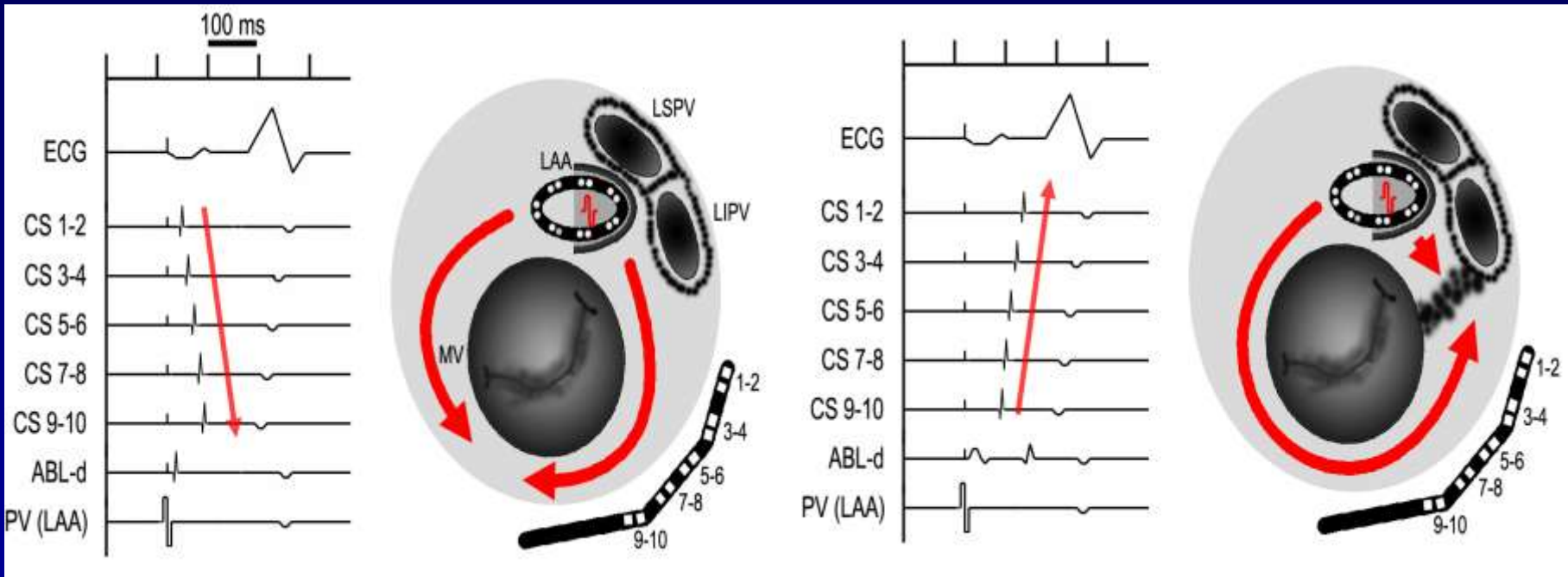


Lasso in Left Atrial Appendage

Assessing mitral isthmus block – pacing from the LAA

No mitral isthmus block

Mitral isthmus block



Change to a proximal to distal CS activation signifies block
(Paisey et al. JCE 2009)

Oh dear!



Entrainment from mid back wall



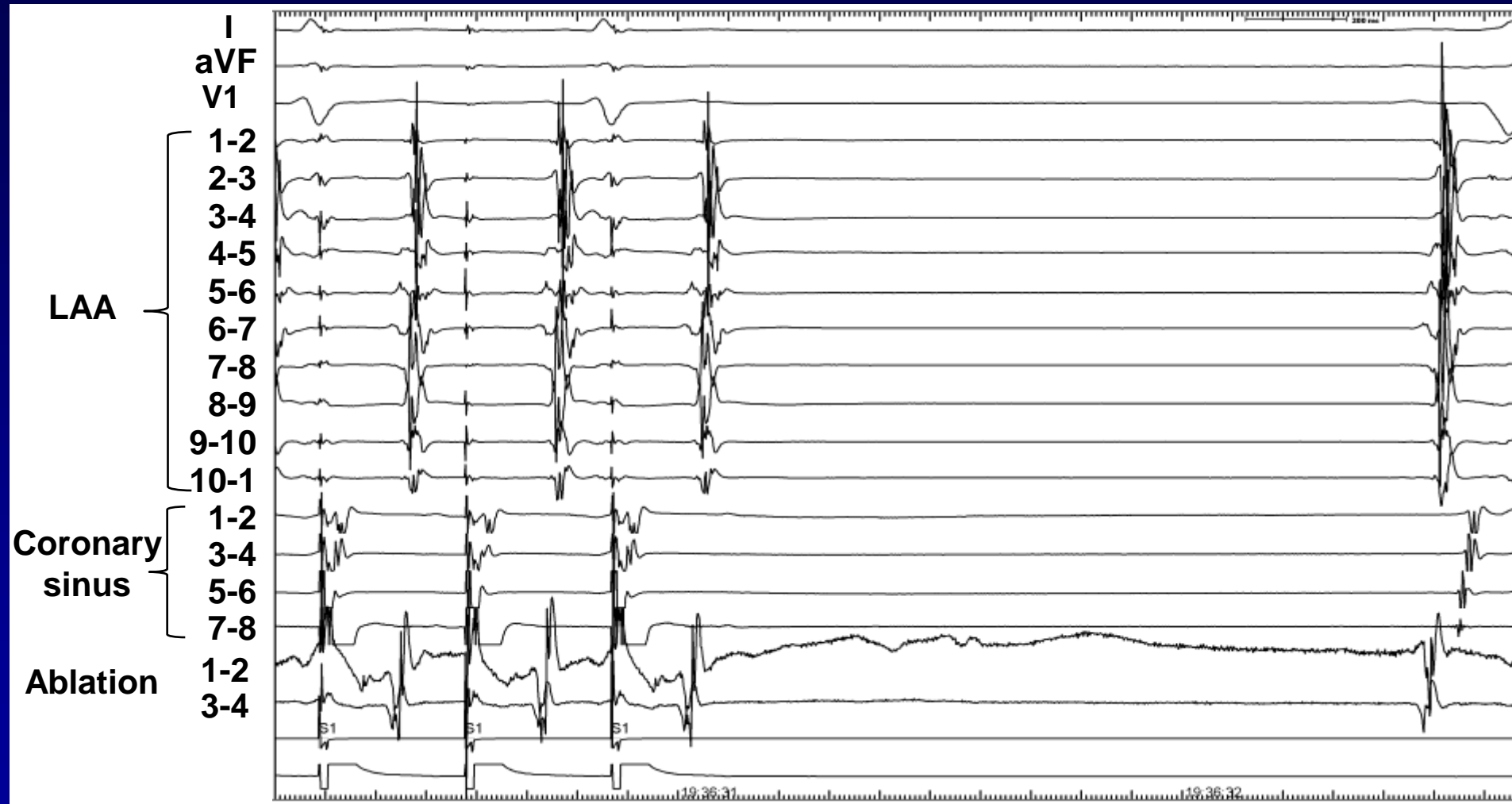
Not bad – not perfect

Entrainment from septum



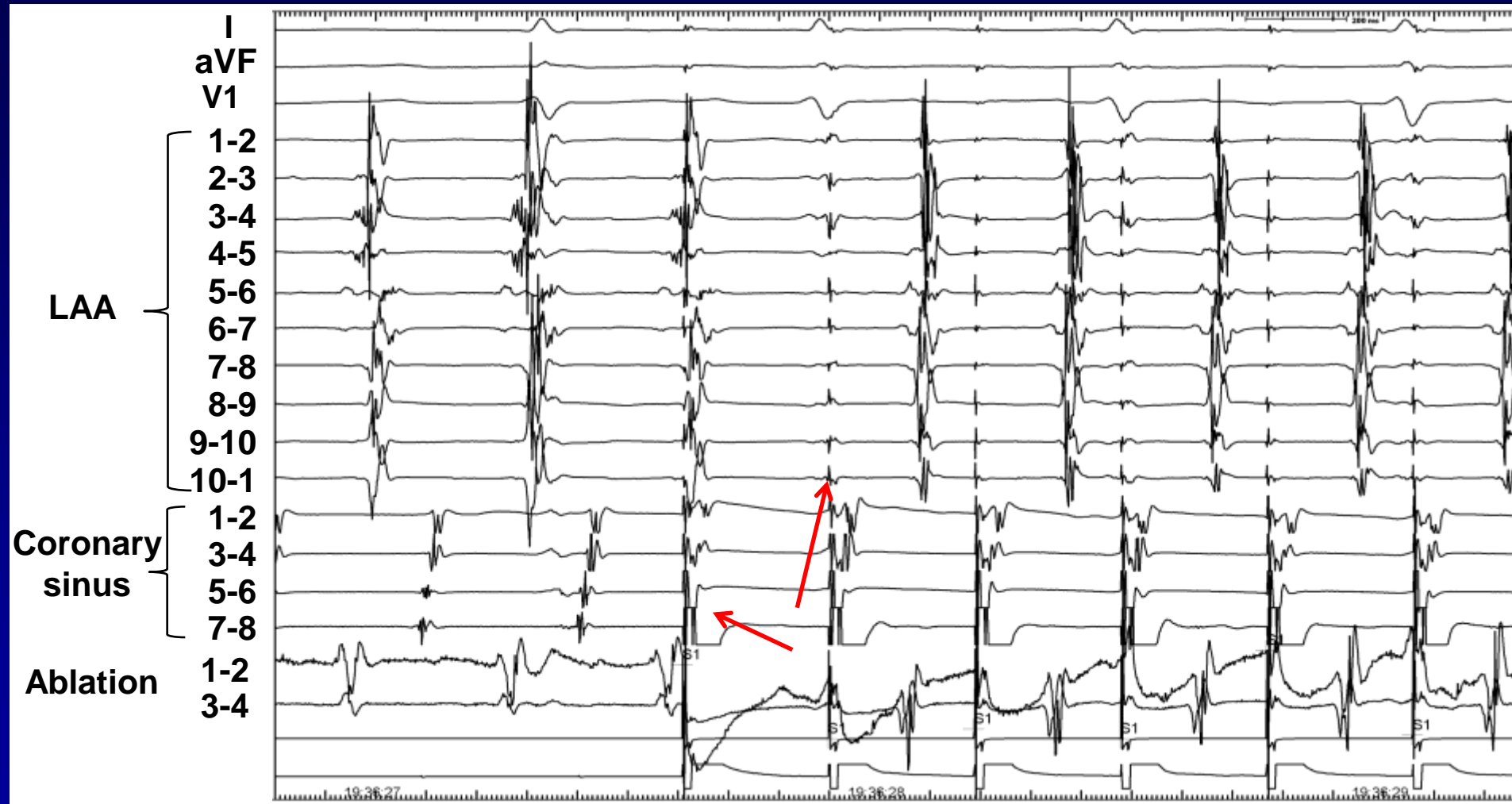
Excellent

Entrainment from Coronary sinus



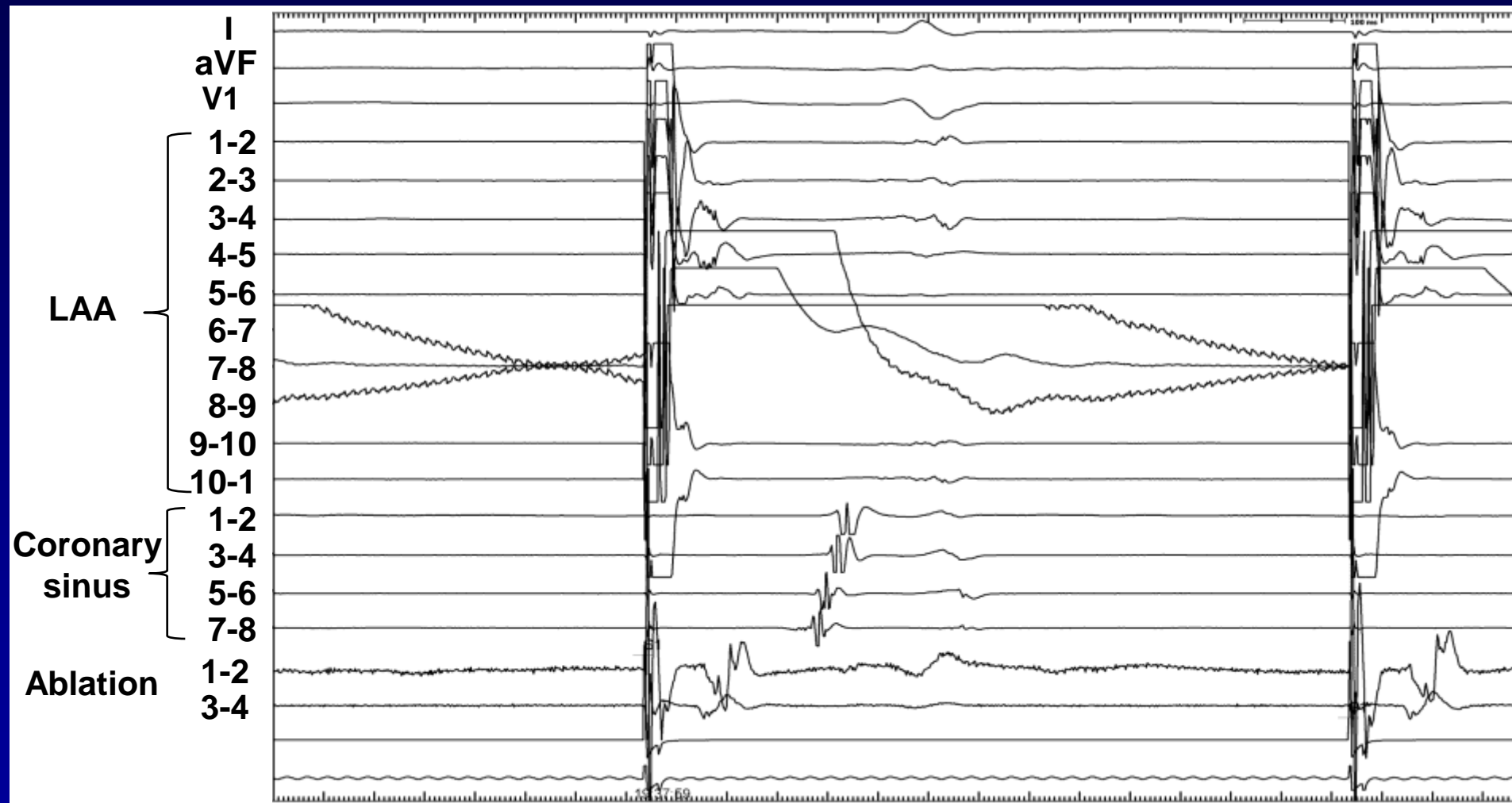
Termination

A closer look



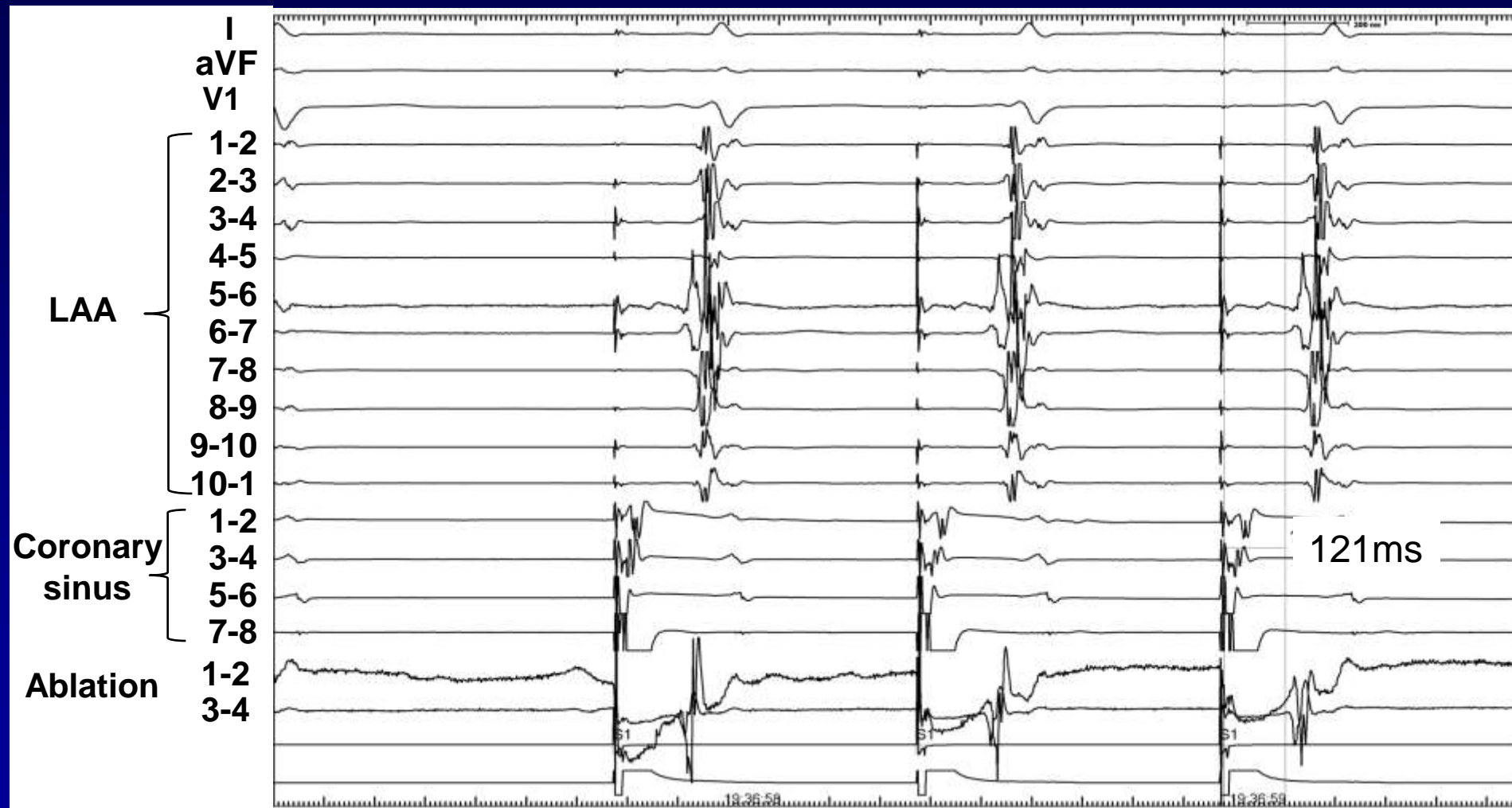
Terminates with the first paced beat without capture of the LA

But the mitral isthmus is blocked

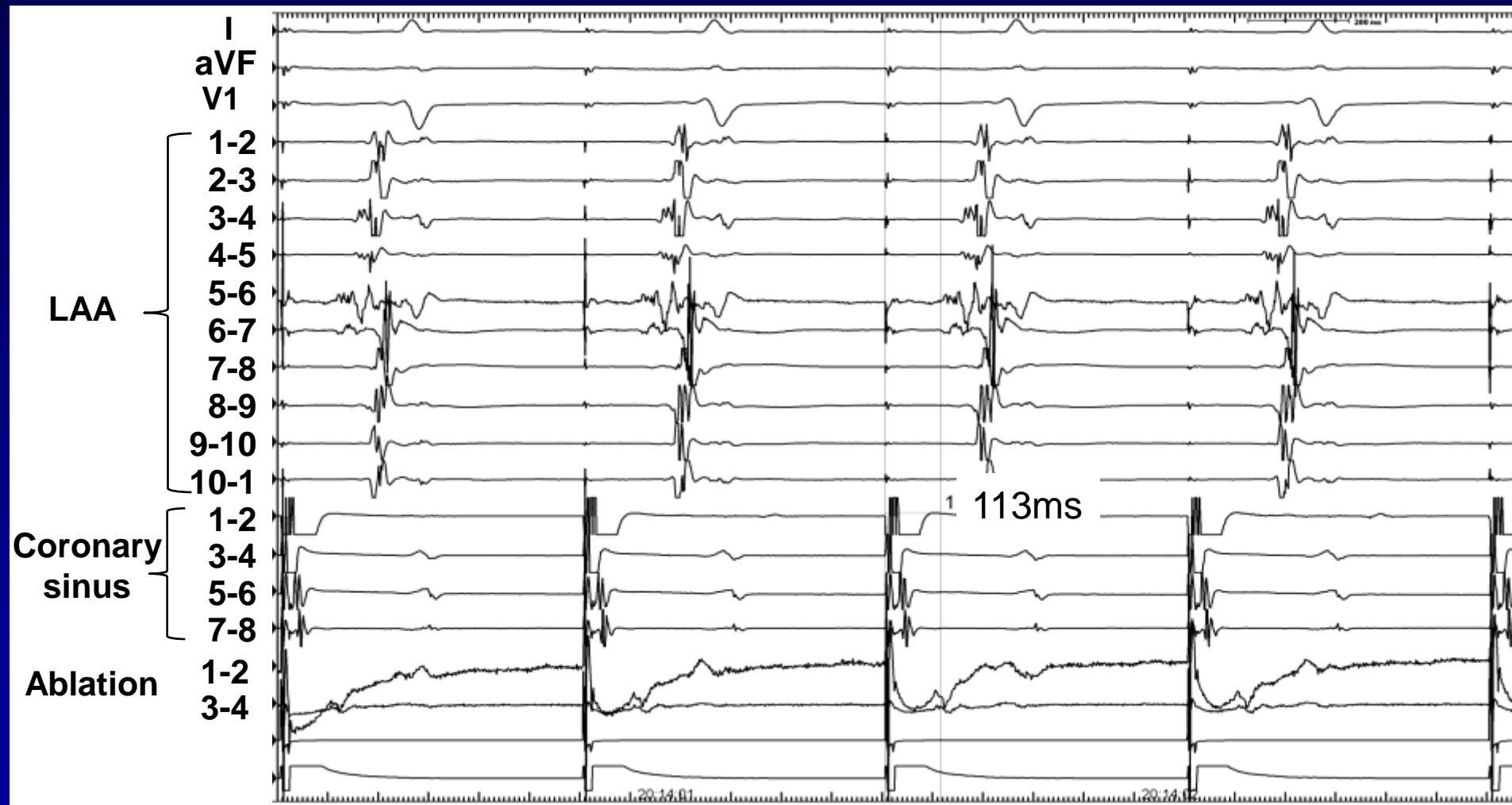


200mm/s

Pacing from proximal CS



Pacing from distal CS



Unidirectional mitral isthmus block –
?Conducting via ligament of Marshall

Progress

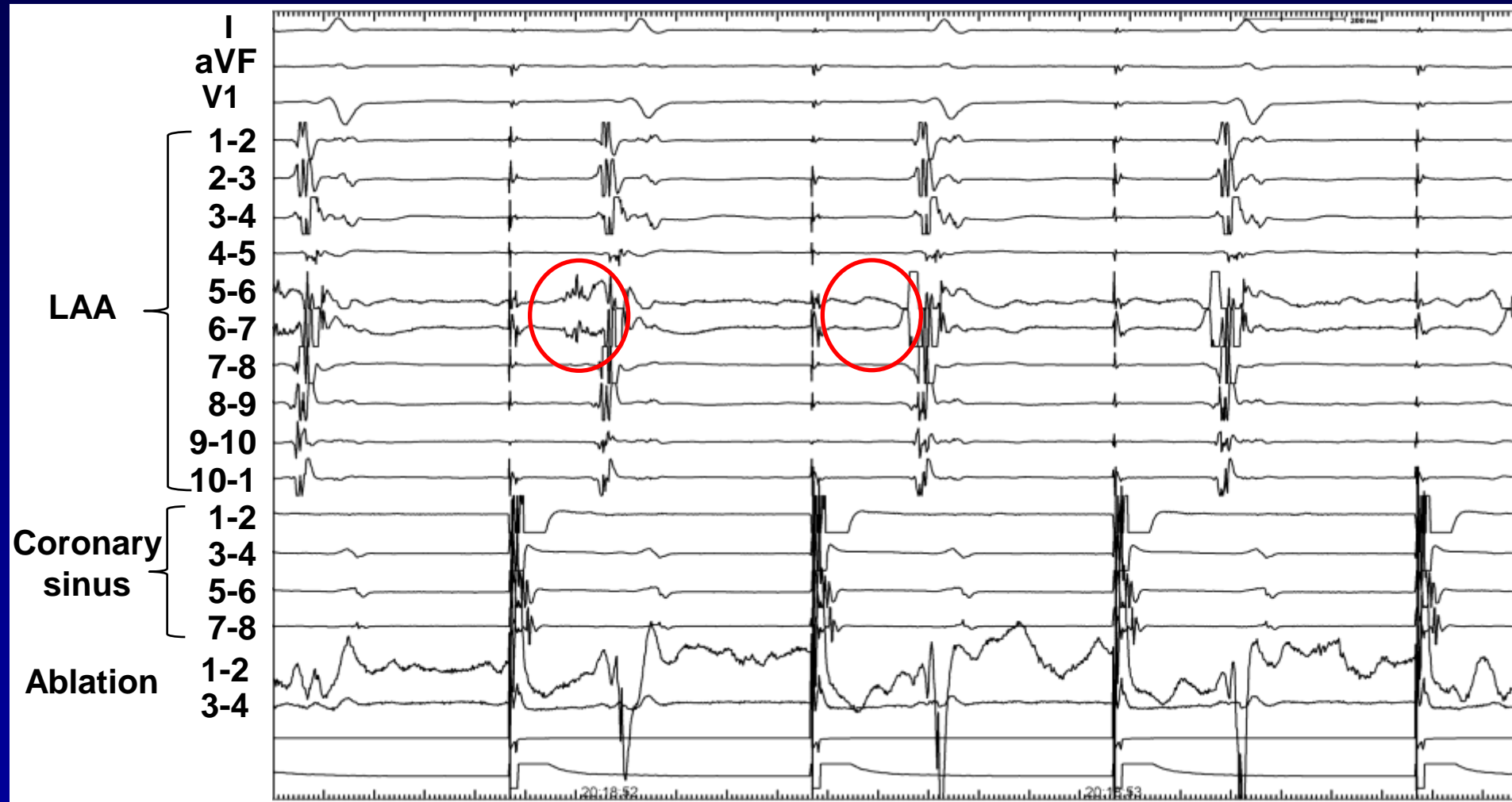
- Easily inducible tachycardia
 - From the LAA
- Always terminated with first paced beat pacing from the CS
- No early signals on the mitral isthmus
- Unable to find early left atrial signals during tachycardia

Ablation during CS Pacing



Earliest signal in the floor of the proximal LAA

Loss of Vein of Marshall conduction



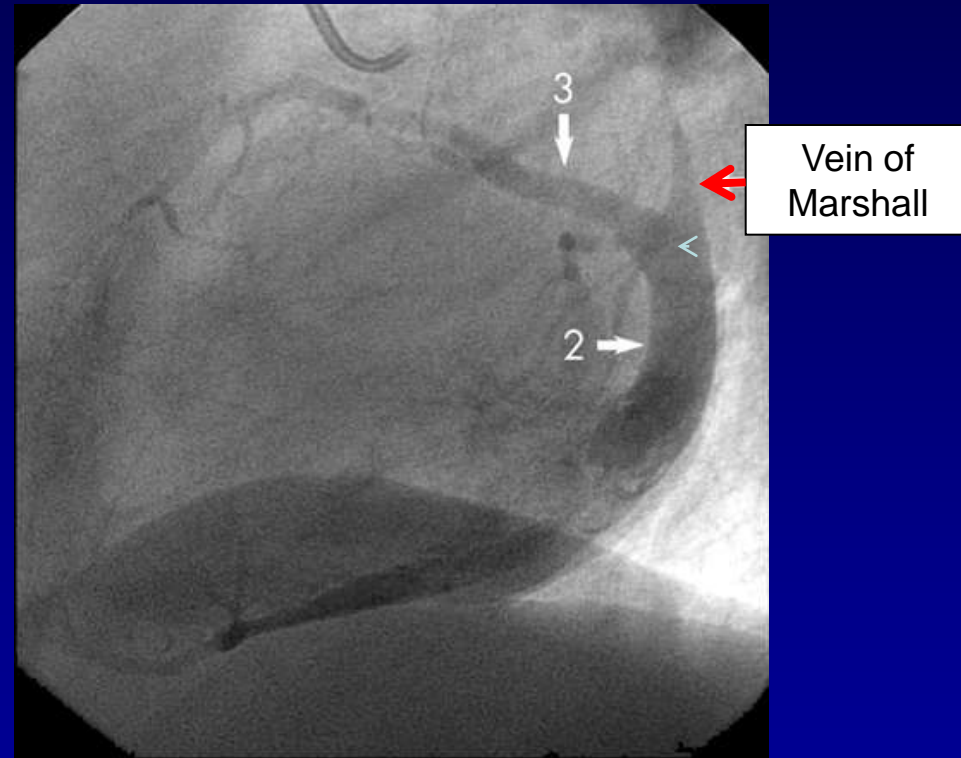
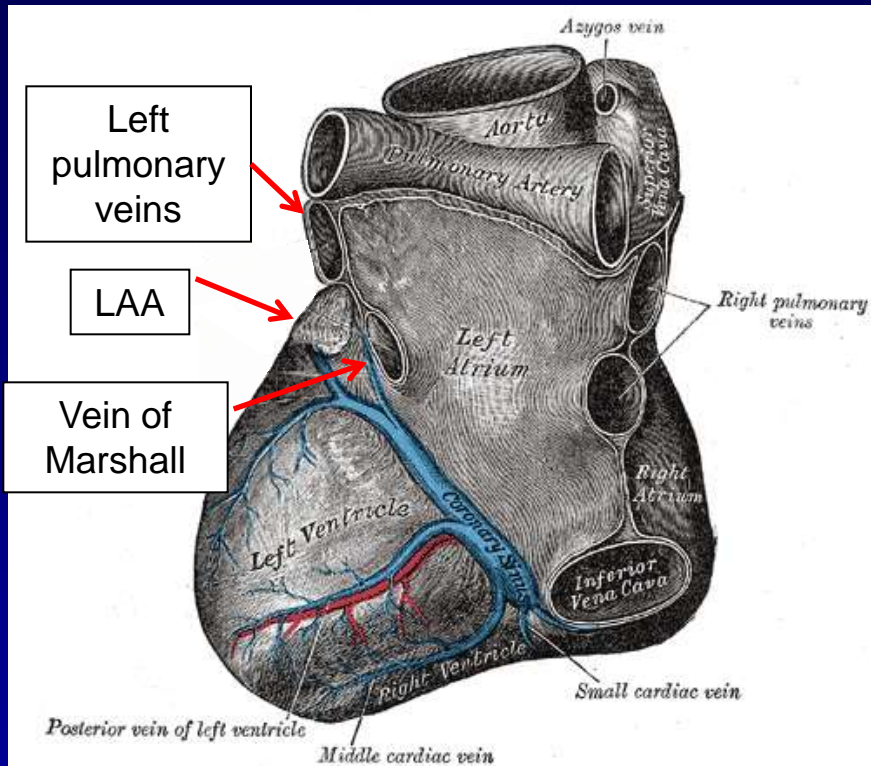
Outcome

- Totally non-inducible
- True Bidirectional isthmus block

Final diagnosis:

“Macro re-entrant atrial tachycardia with unidirectional conduction across the mitral isthmus via the Ligament of Marshall”

The ligament of Marshall



Conclusions

- True block can only be confirmed by differential pacing from both sides of the line
- Termination of a tachycardia during entrainment always need closer inspection
- The ligment of Marshall is a common cause of mischief

