

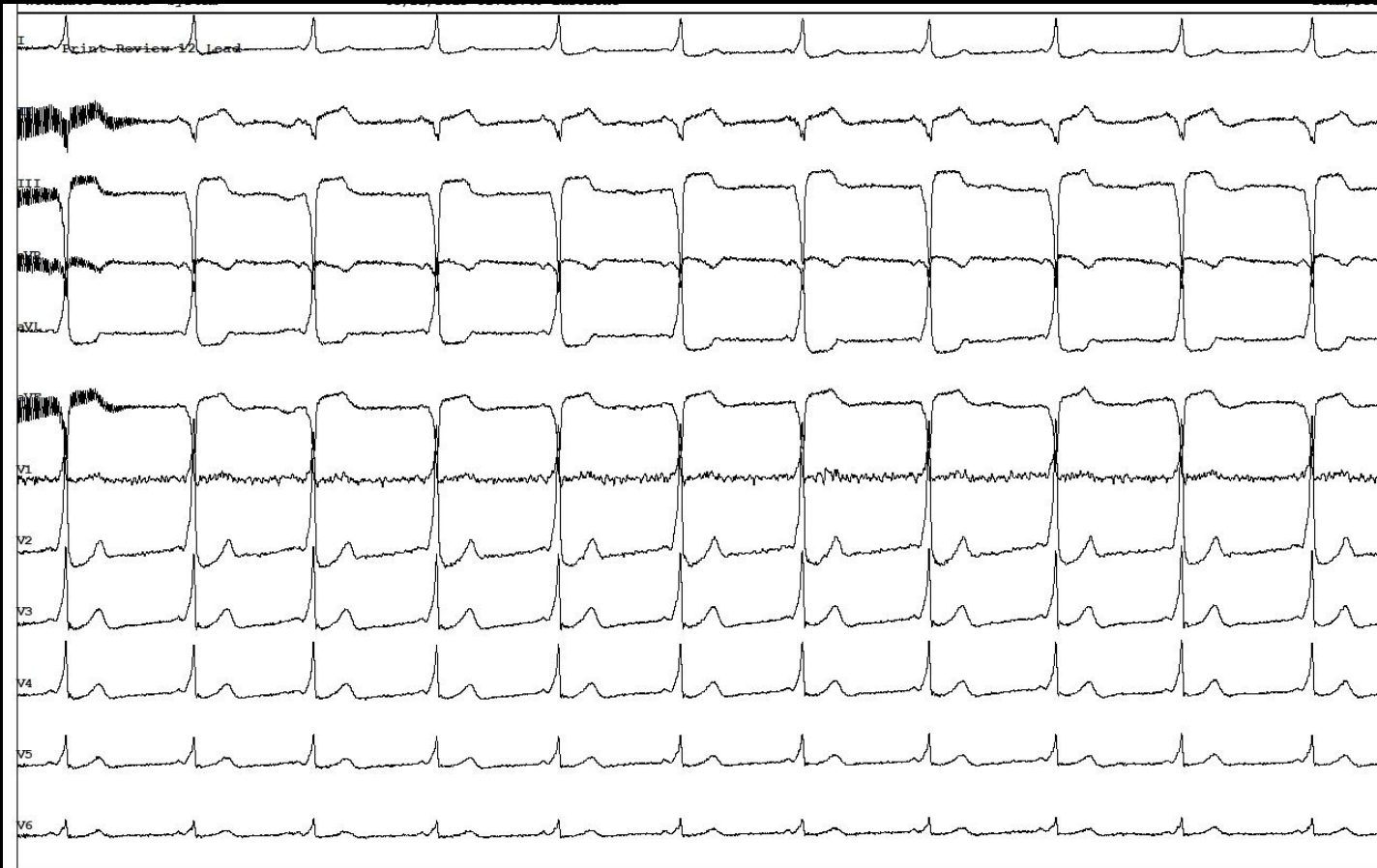
MISSED CONNECTION: A CASE OF REDO SVT

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THE CASE

- 44yr gentleman, recurrent palpitations
- Documented narrow QRS tachycardia responsive to adenosine.
- H/O similar episodes since last 2 years.
- Had ablation in another centre 6 mo back – left posterior accessory pathway ablated from LA. No records of egm was there with him.
- Echo- no structural heart disease.

BASELINE ECG



Suggestive of preexcitation through accessory pathway-left posterior.

BASELINE INTERVALS



AH 83 HV 8ms

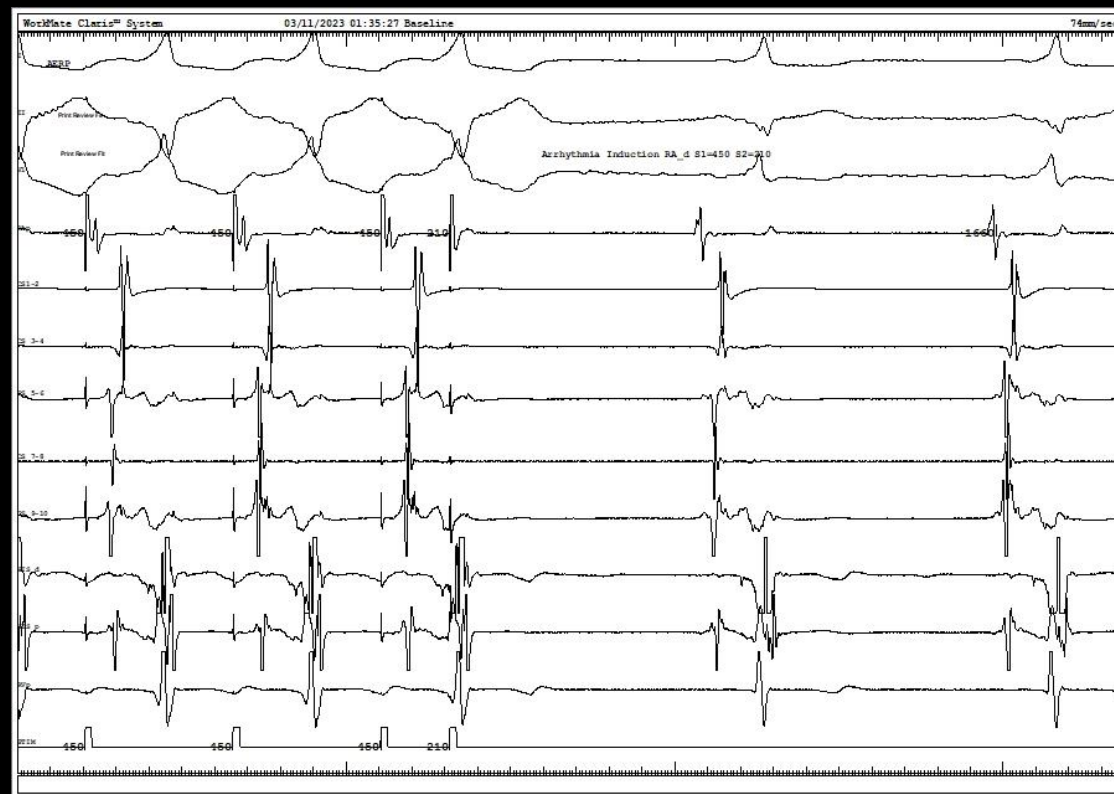
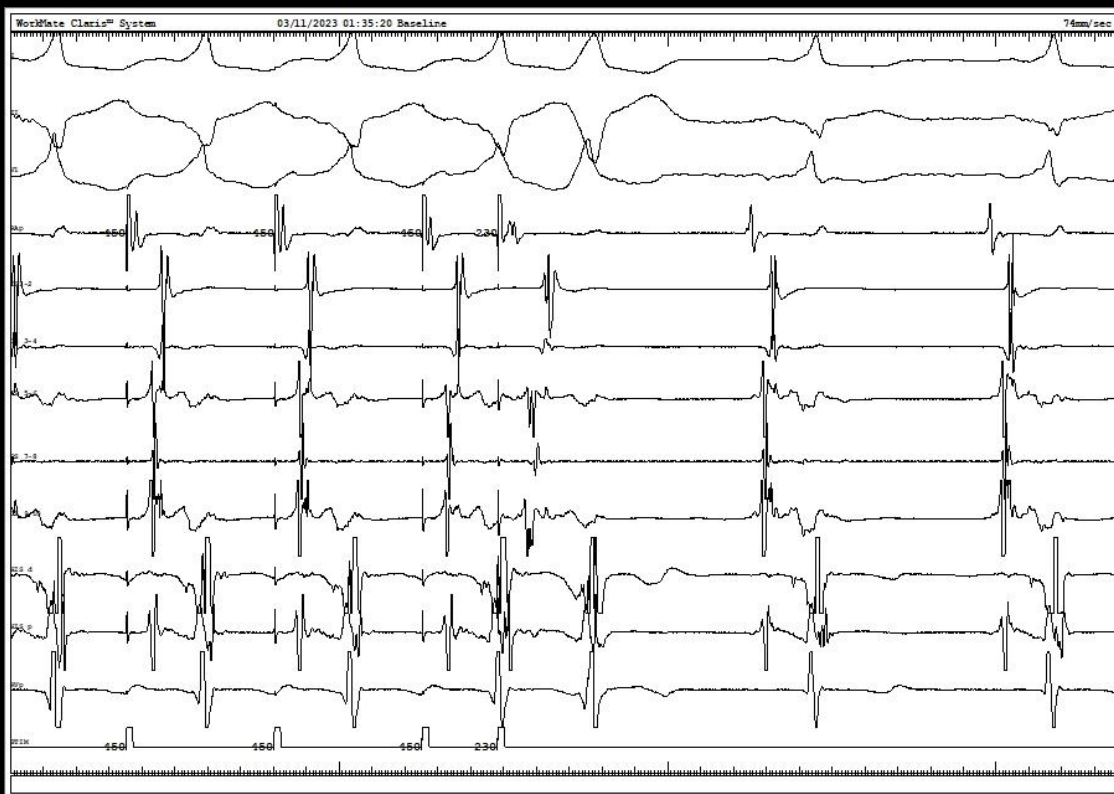
VENTRICULAR EXTRA

- Retrograde A is earliest at CS 7,8.
- Nondecremental VA conduction.
- Retrograde ERP of pathway <210ms

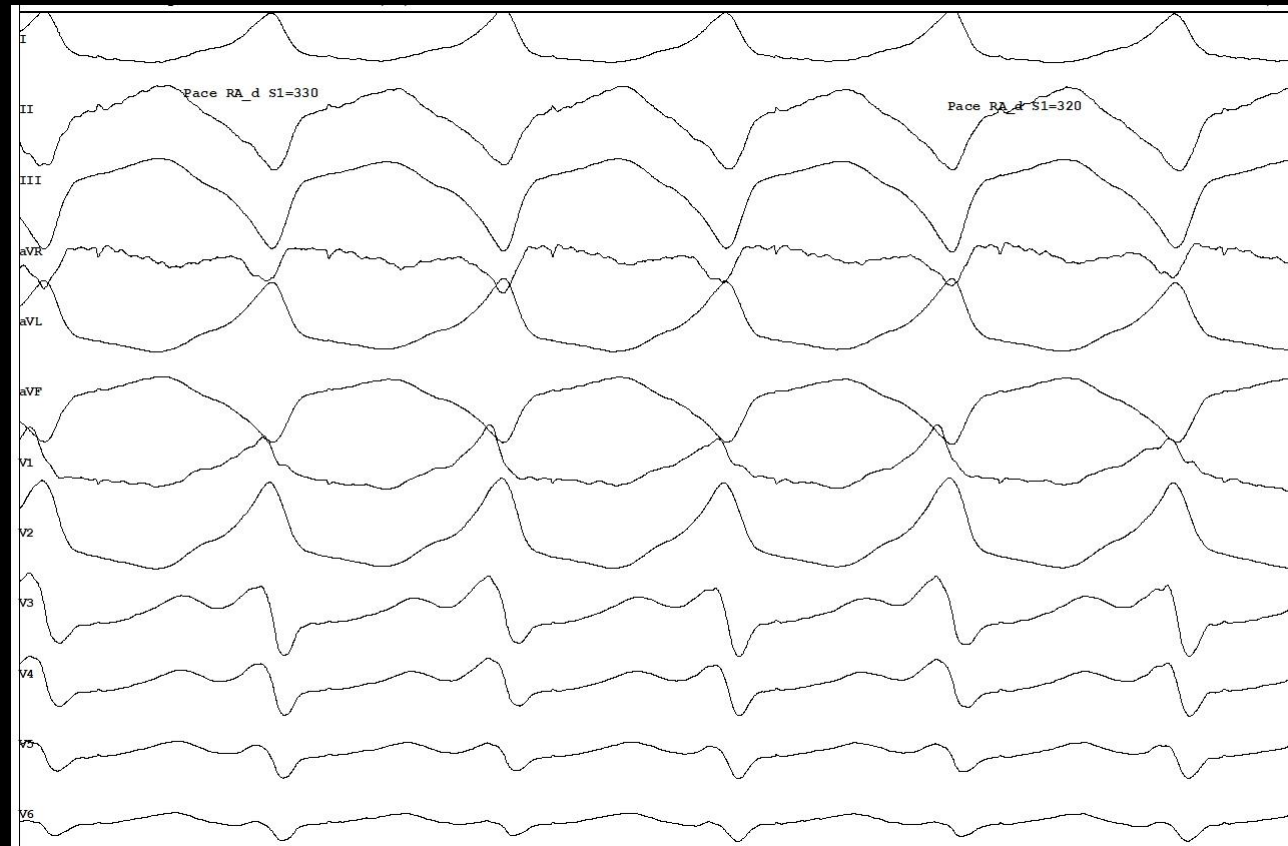


ATRIAL EXTRA

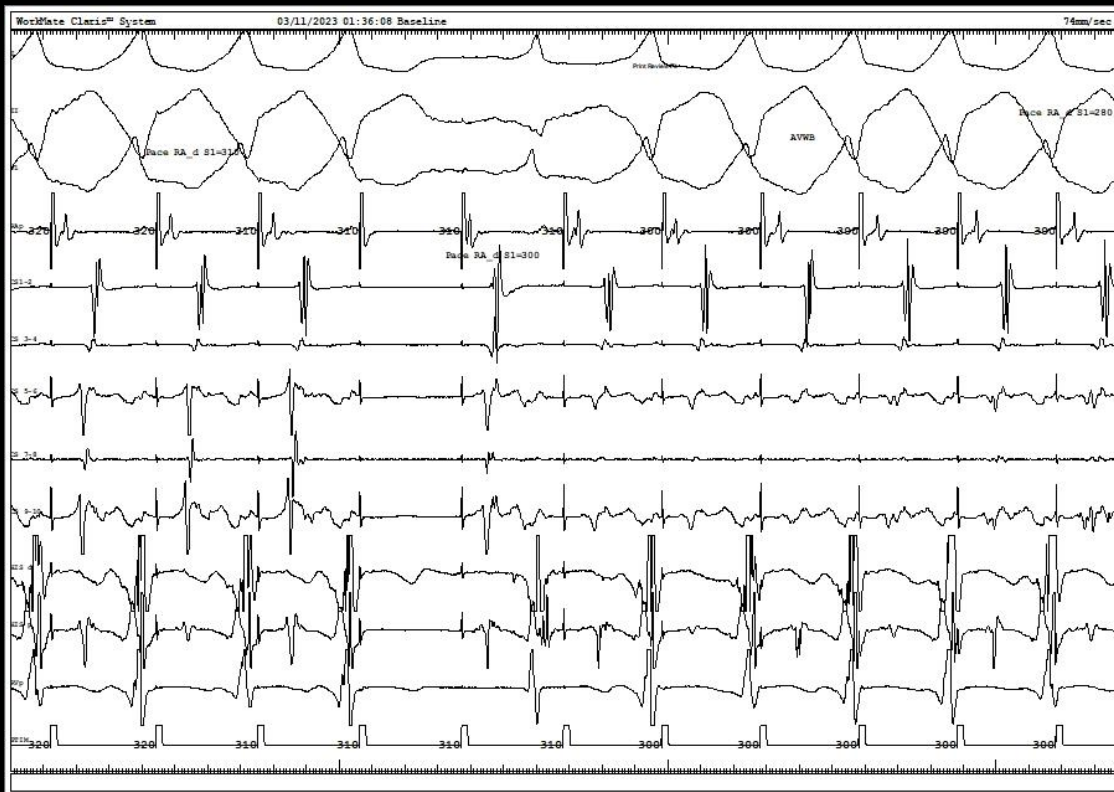
Antegrade APERP <230ms



MAXIMAL PREEXCITATION

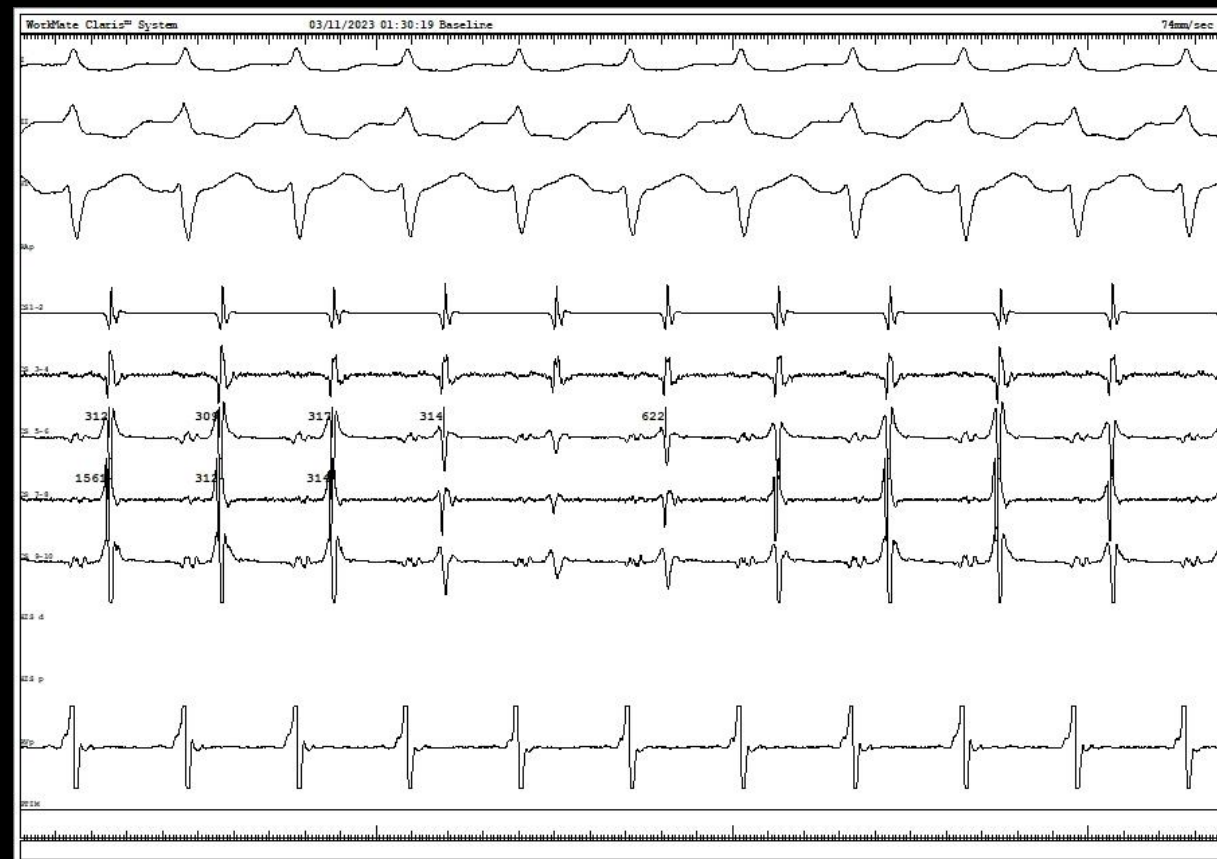
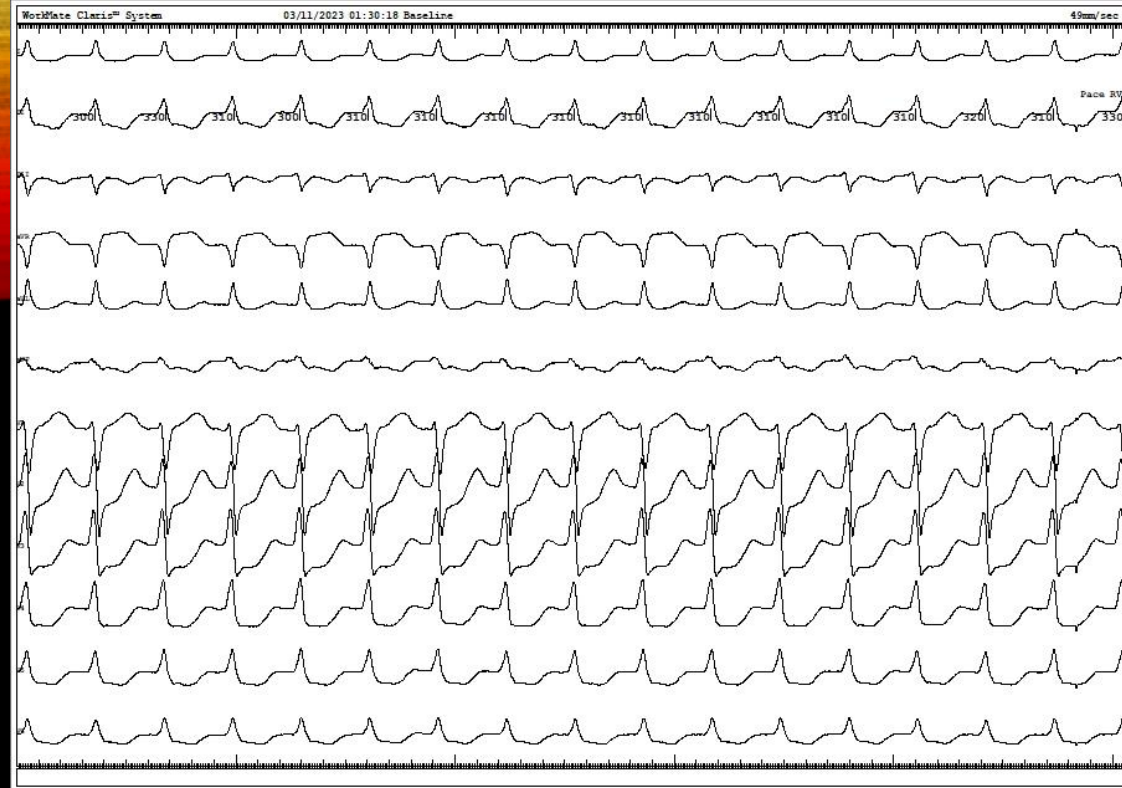


AV WENKEBACH- ??

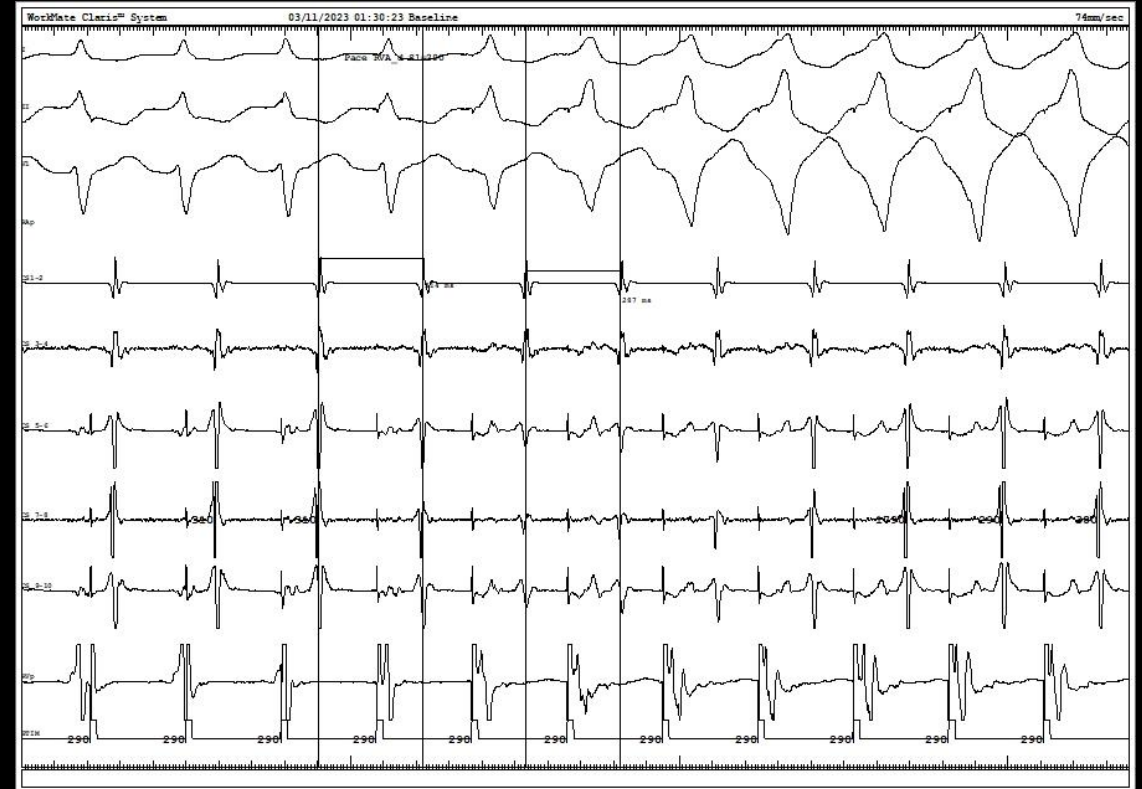
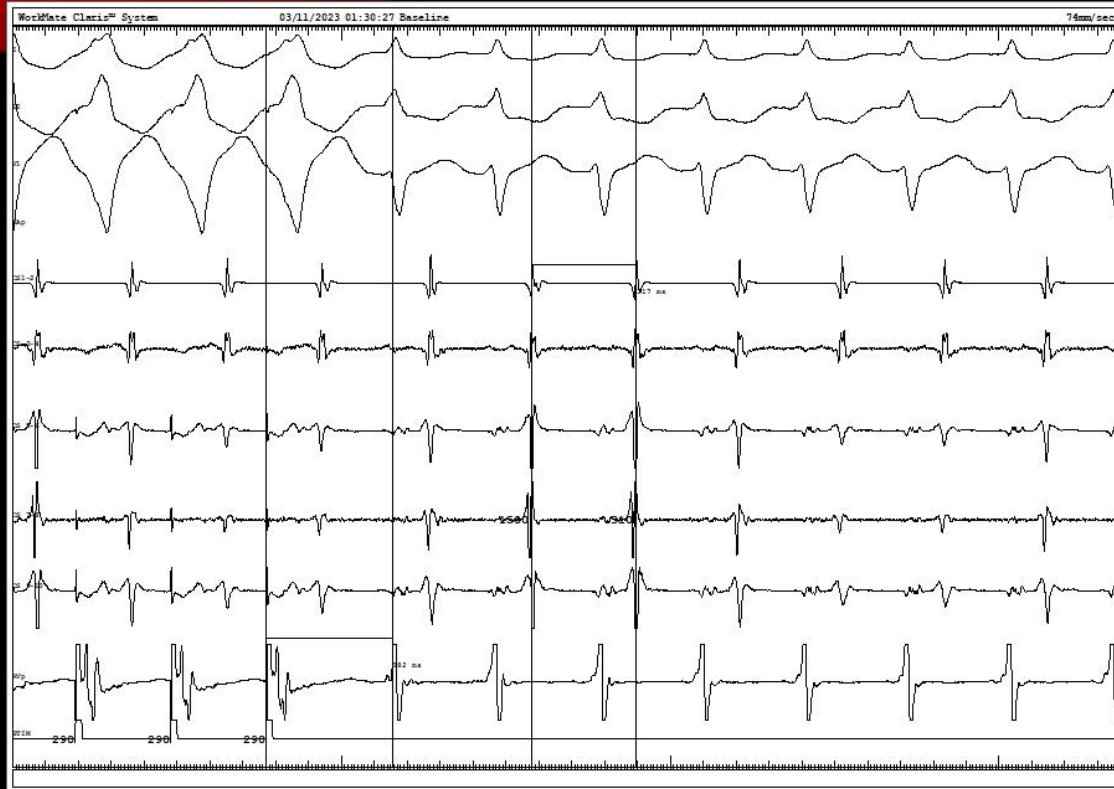


TACHY-

- Narrow QRS tachycardia at CL 310ms , induced by ventricular or atrial pacing.
- Earliest A at cs7.8



VENTRICULAR ENTRAINMENT



- PPI- TCL= 382-317= 65ms
 - Entrained at the first fused beat
- All suggestive of orthodromic AVRT

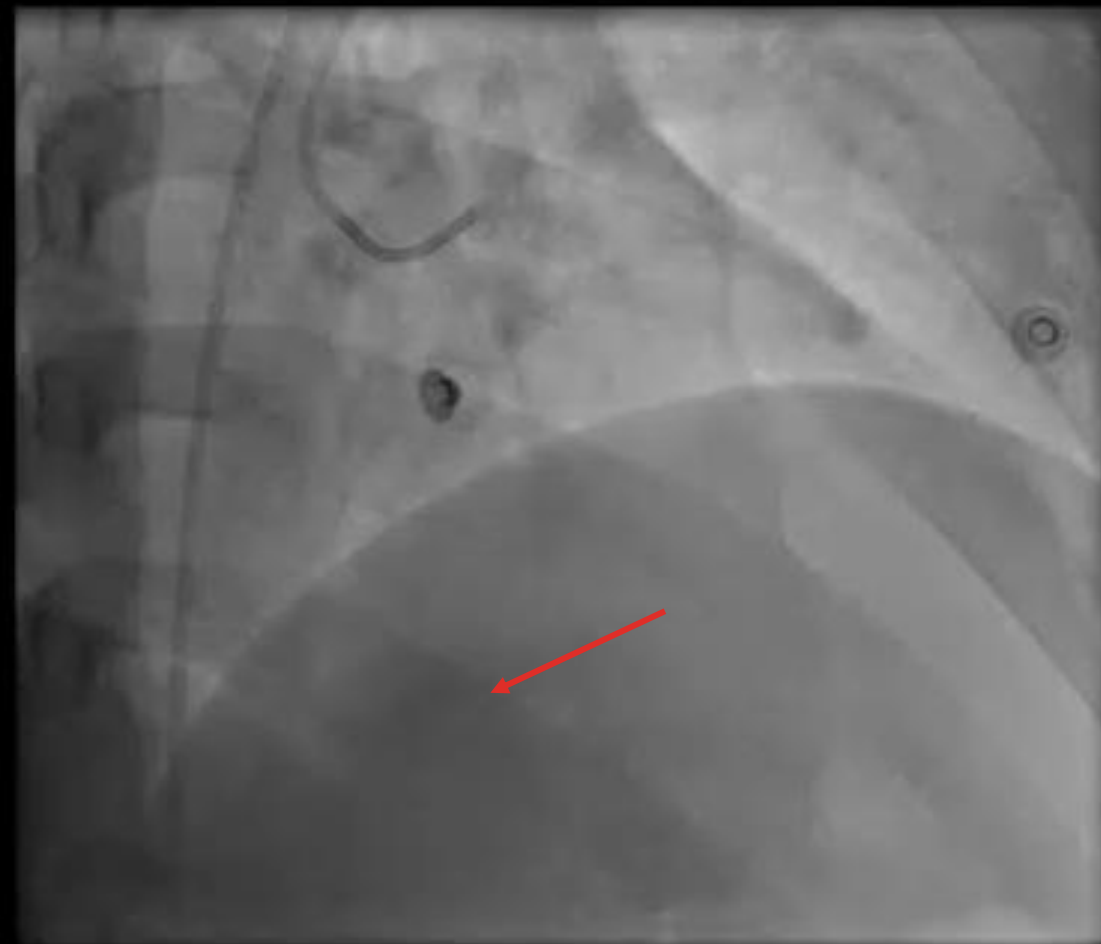
EP DIAGNOSIS

- Manifest left posterior accessory pathway.
- Pathway characteristics- high risk pathway
- Inducible AVRT

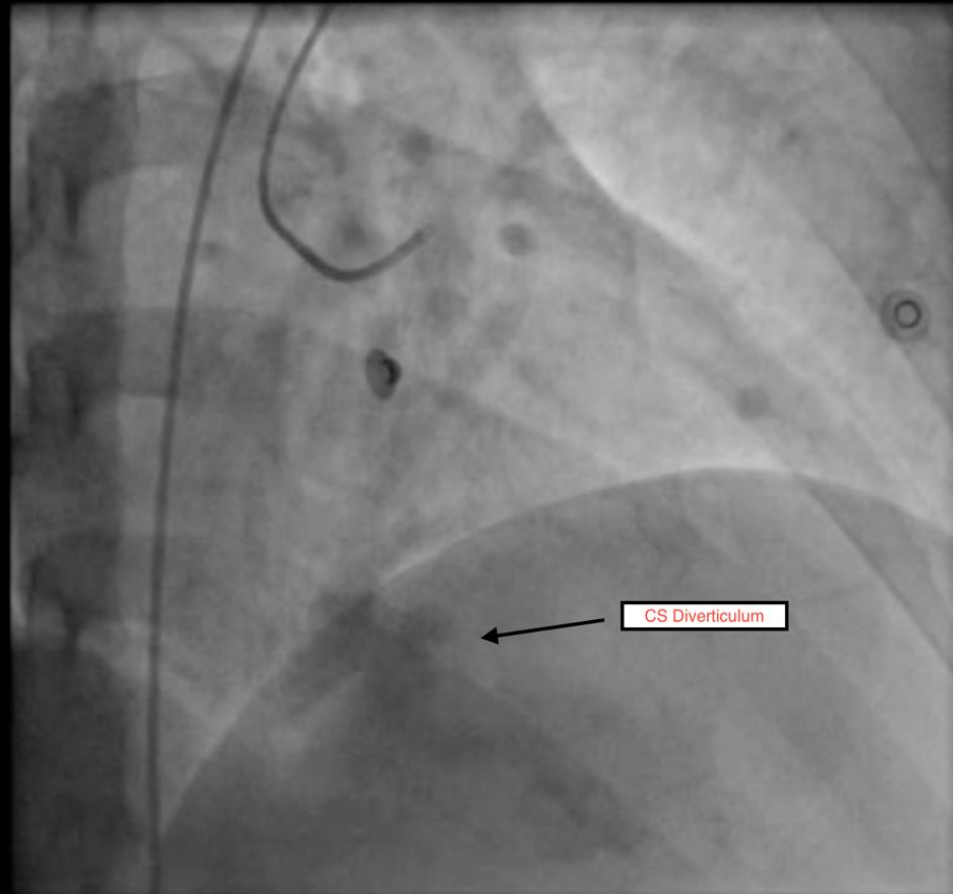
MAPPING AND ABLATION

- Points to consider before mapping
 1. Failed ablation once –
 2. Left posterior area pathway-
- We considered to look for coronary sinus abnormalities upfront in view of the above reasons.
- If there is coronary sinus diverticulum, most of the cases the pathway will be localized in its neck and will not need septal puncture and we need to use an irrigated ablation catheter.

LEVOPHASE CS ANGIOGRAM



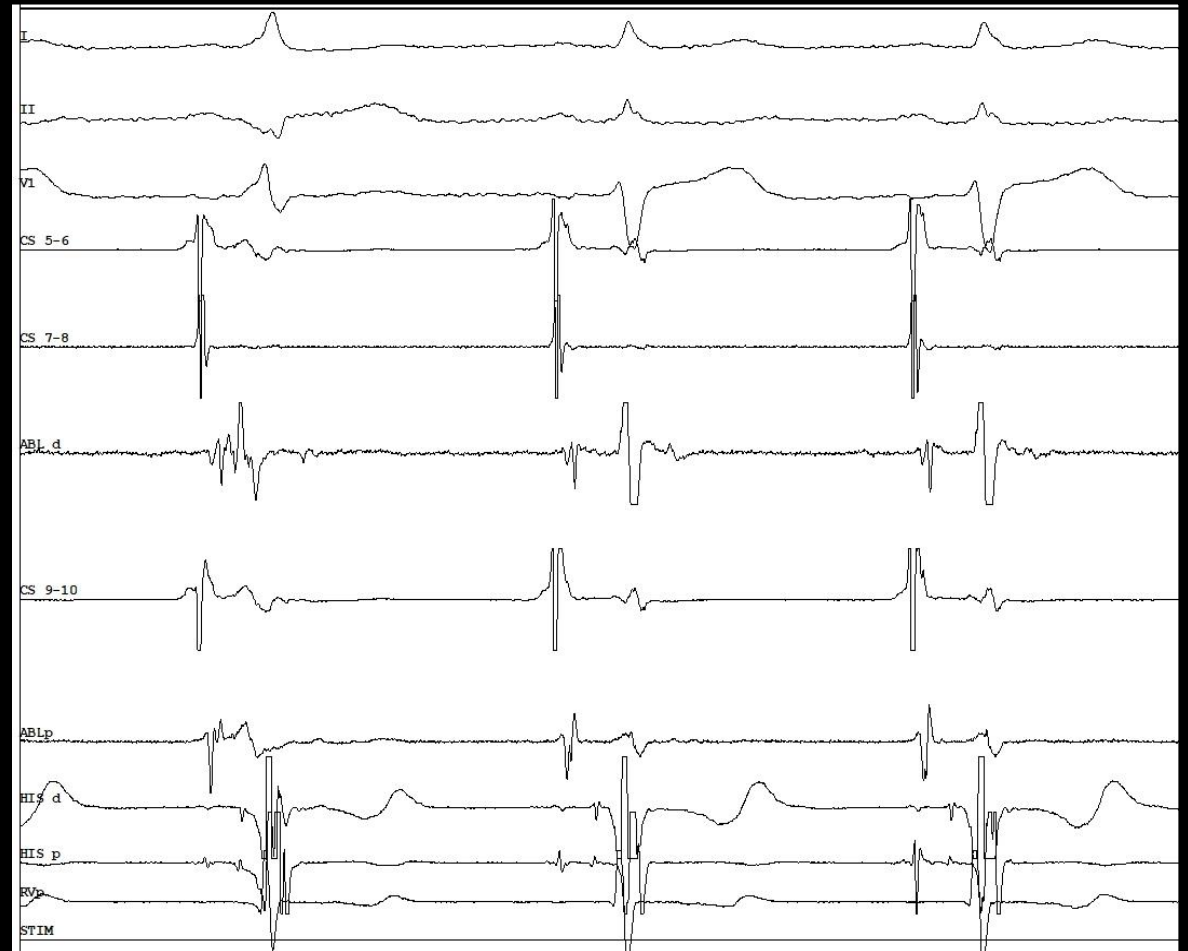
DIVERTICULUM IN PROXIMAL MCV



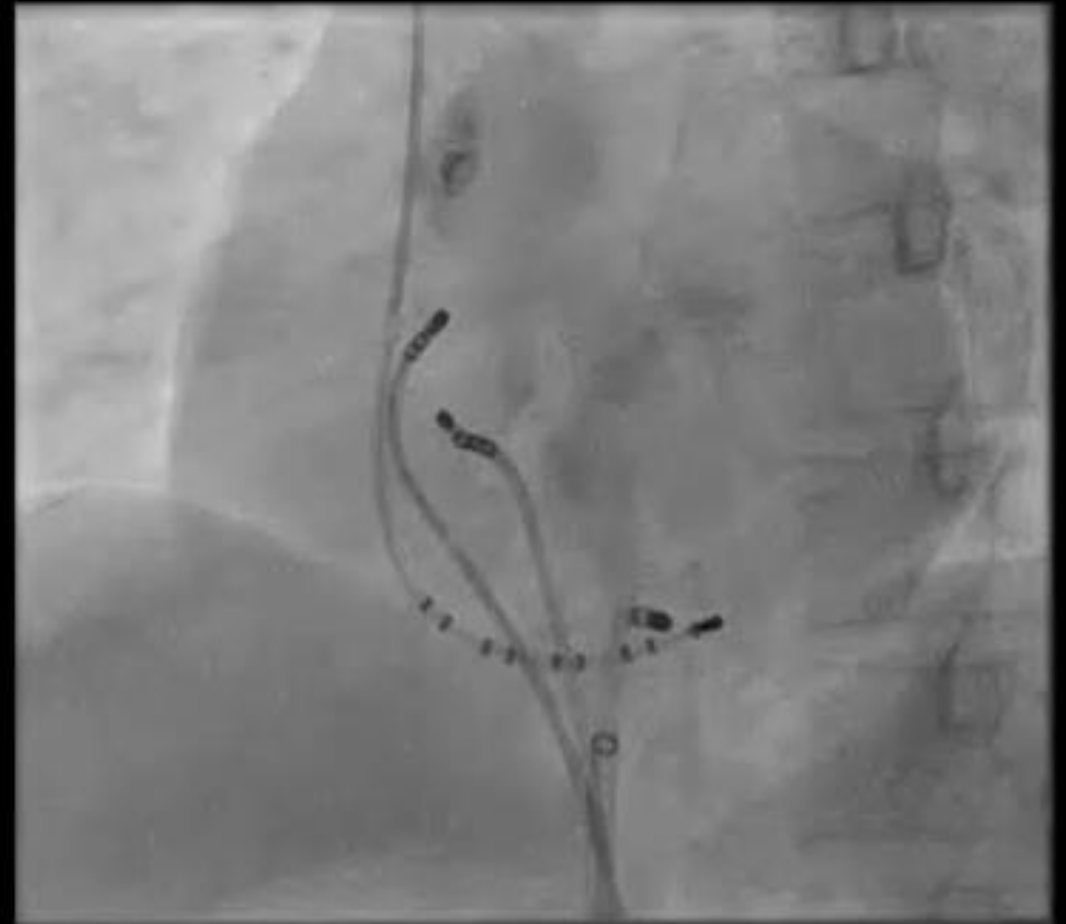
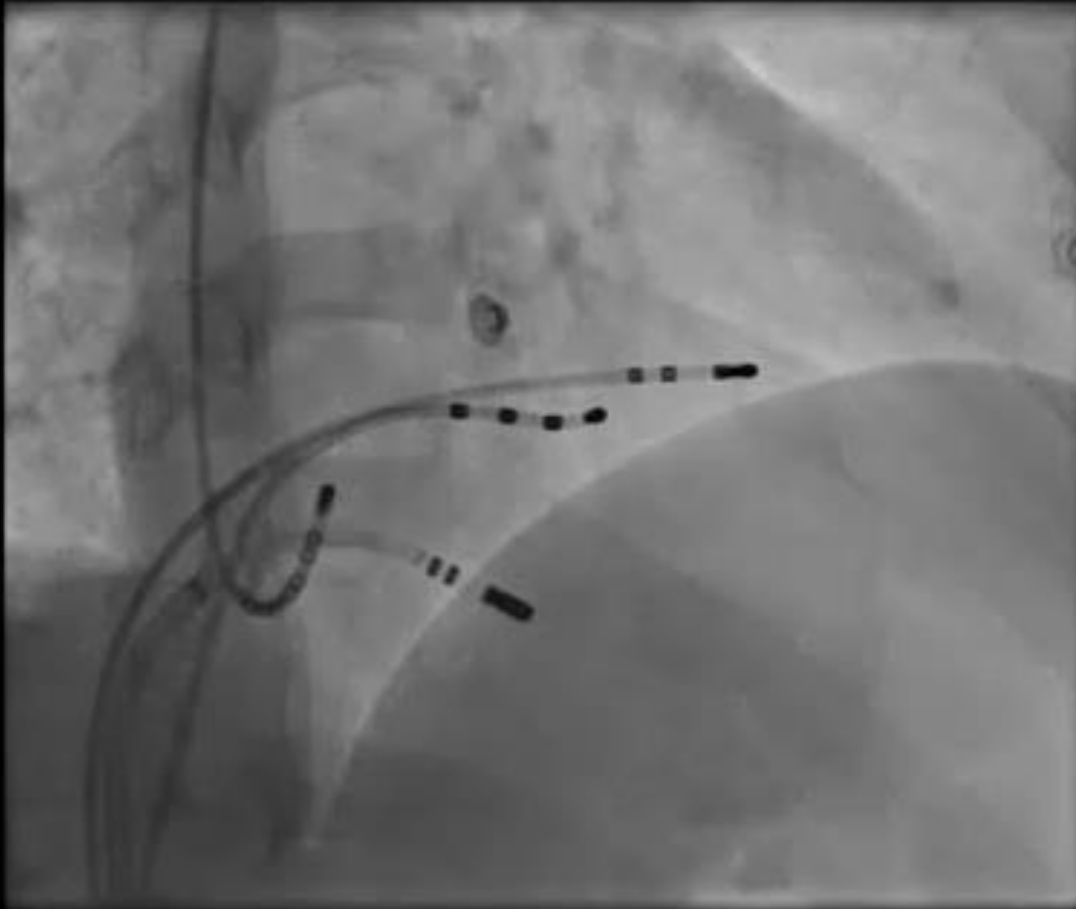
ABLATION TACTICS

- Irrigated catheter
 - Power 35W 45 degree centrifuge
 - Target neck of diverticulum
 - To look for CS muscular potentials.
 - Ablation from LA is often unsuccessful.
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- Better always to put two deapolars in CS, one along roof and one along floor.
 - In epicardial cs related ap, floor A will be earlier than the roof.

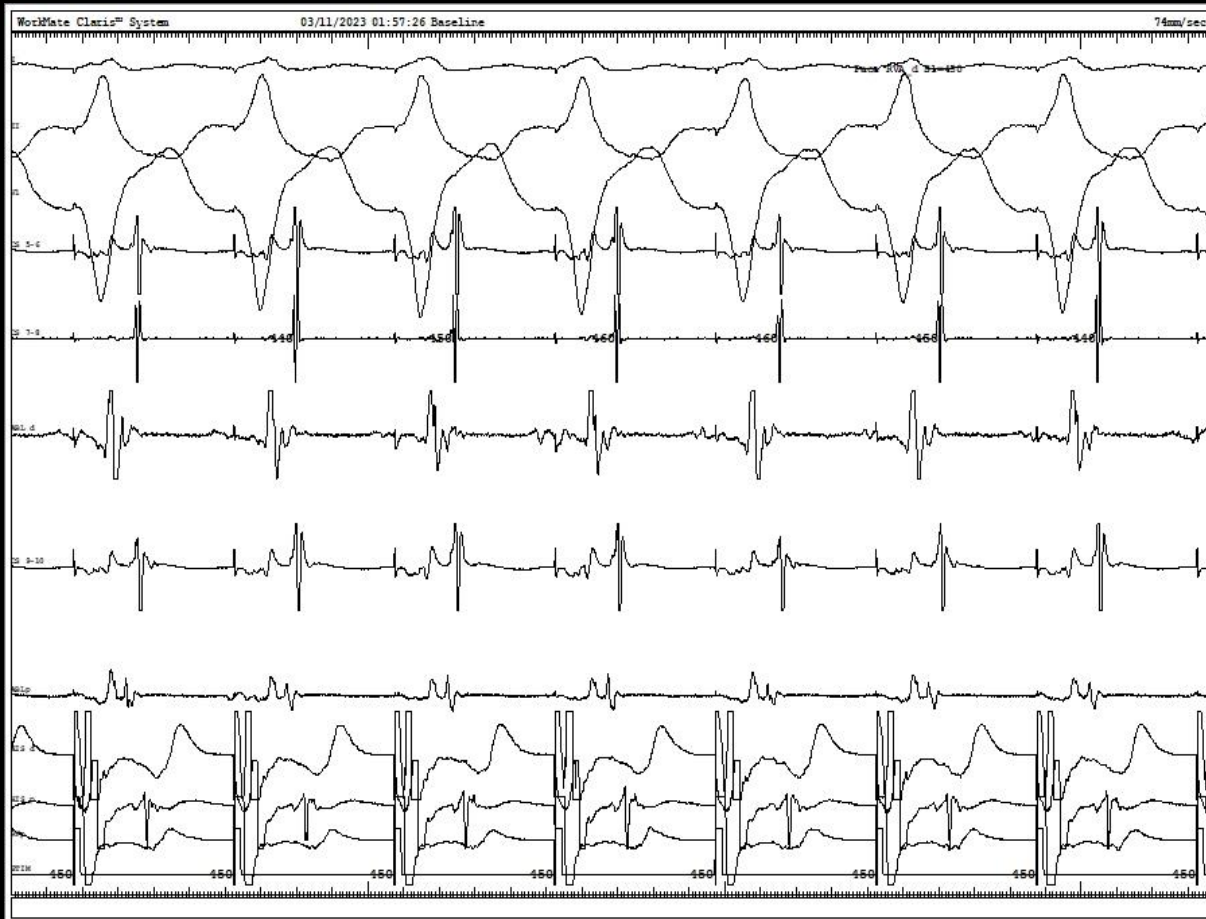
ABLATION SIGNALS-LOSS OF PREEXCITATION



CATHETER AT NECK OF DIVERTICULUM

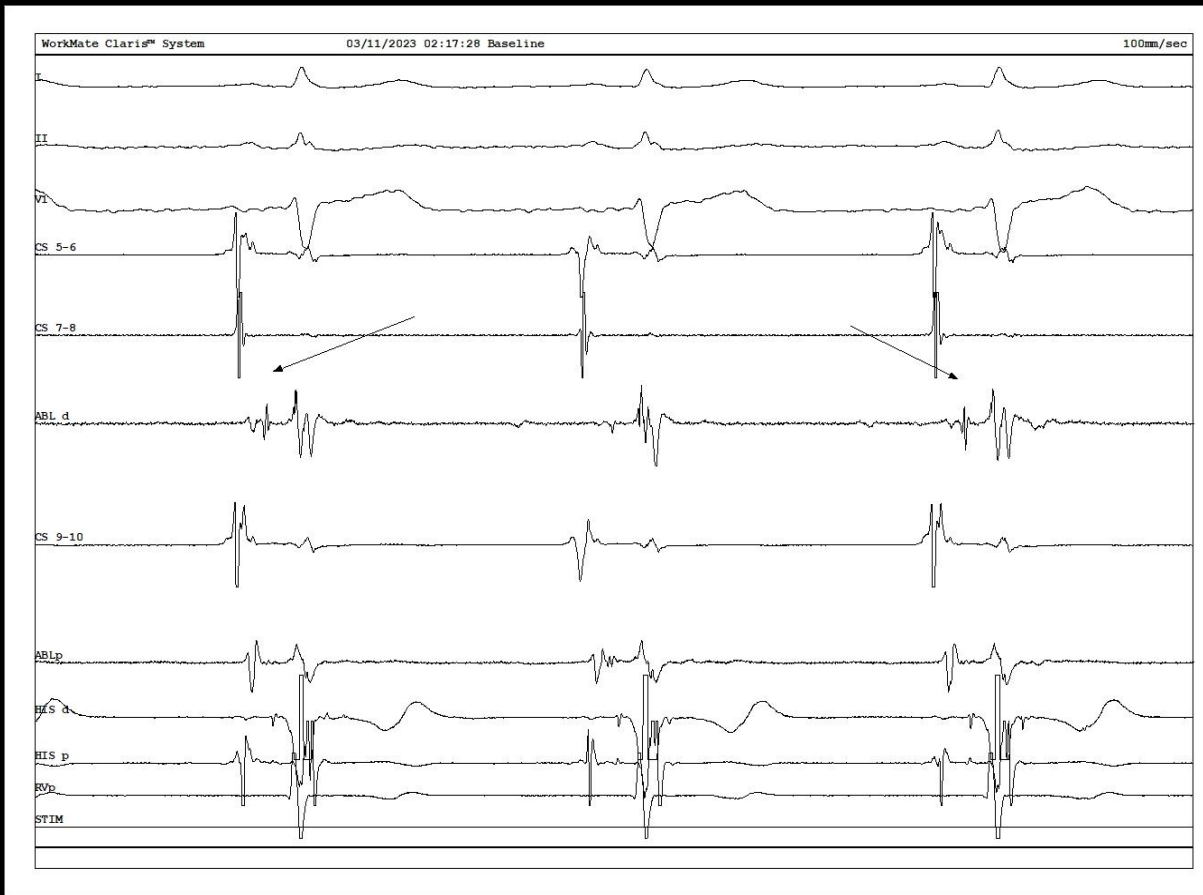


RETROGRADE PERSISTED



- Mapped again near the neck and higher up at cs- mcv junction.

GOOD POTENTIALS- RETROGRADE GONE HERE IN <2S



APPROACH TO FAILED ABLATION OF SVT

REEVALUATE ELECTROGRAM INTERPRETATION

- Presence of far-field activity on the electrogram before the rapid deflection suggests need for more accurate pathway localization •
- Use a unipolar electrogram to help determine ideal timing compared with the rapid deflection of the bipolar electrogram •
- Possible misinterpretation of closely approximated A and V electrograms •
- Assess and compare local A and V activation during sinus rhythm and A or V pacing •
- Brush back and forth from A to V to clarify timing of A and V activation (especially at the right free wall, where A and V may be superimposed) •
- Pacing maneuvers to dissociate the putative AP potential from A and V electrograms (useful in the presence of fractionated electrograms)

CATHETER STABILITY

- Remap using a long sheath or different catheter curve to improve stability
- Consider an alternative approach: SVC versus IVC, retrograde aortic versus transseptal entrainment during AVRT to prevent dislodgment with RF termination of tachycardia •
- Cryoablation

CONSIDER ALTERNATIVE TARGET

- May be left sided or epicardial, possibly accessible through the coronary sinus •
- Atypical accessory pathways and non-annular AV pathways •
- Map at sites away from the AV annulus (e.g., appendage, outflow tract, sinuses of Valsalva)

TRANSIENT LOSS OF PREEXCITATION

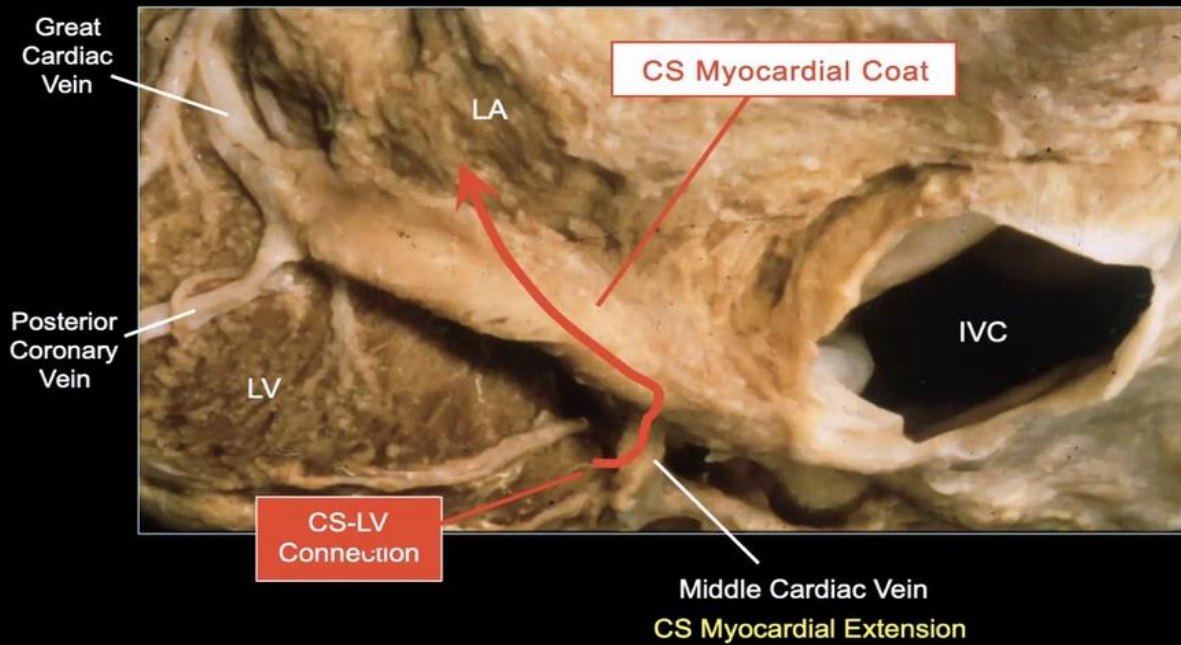
- Time to elimination is a good indicator of ablation catheter proximity to the pathway •
- Instability—same as stated previously •
- Multiple accessory pathways •
- Carefully reevaluate preexcitation pattern or retrograde atrial activation sequence resulting from multiple pacing sites (A and V) •
- Deep or epicardial location •
- Consider using a saline-irrigated catheter

POSTEROSEPTAL PATHWAYS

- A posteroseptal AP may be formed by many possible combinations of connections between the 5 chambers (e.g. RA-RV, RA-LV, LA-LV, LA-RV, CS-LV, CS-RV).
- While most PS-AP can be successfully ablated from the tricuspid or mitral annulus, others require ablation inside the CS or its tributary (e.g. middle cardiac vein).
- This type PS-AP is referred to as epicardial PS-AP because the myocardium of the CS or its tributary is part of the AP connecting the atrium and epicardial surface of the LV.
- Left posteroseptal epicardial connections comprise 20% of the posteroseptal pathways , but 50% in failed cases.

EPICARDIAL PS AP

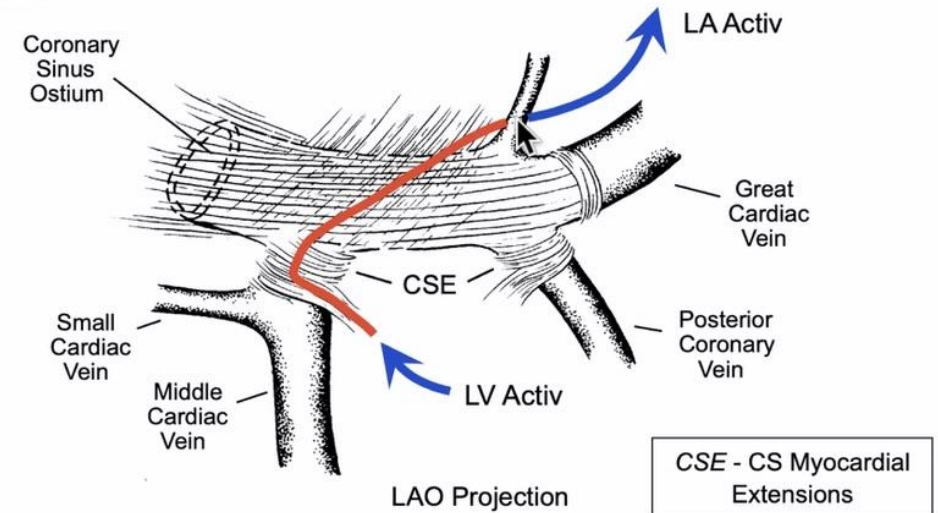
CS-LV Connection (Epi PS AP)



Sun, Jackman, et al, Circulation 2002

CS-LV Connection (Epi PS AP)

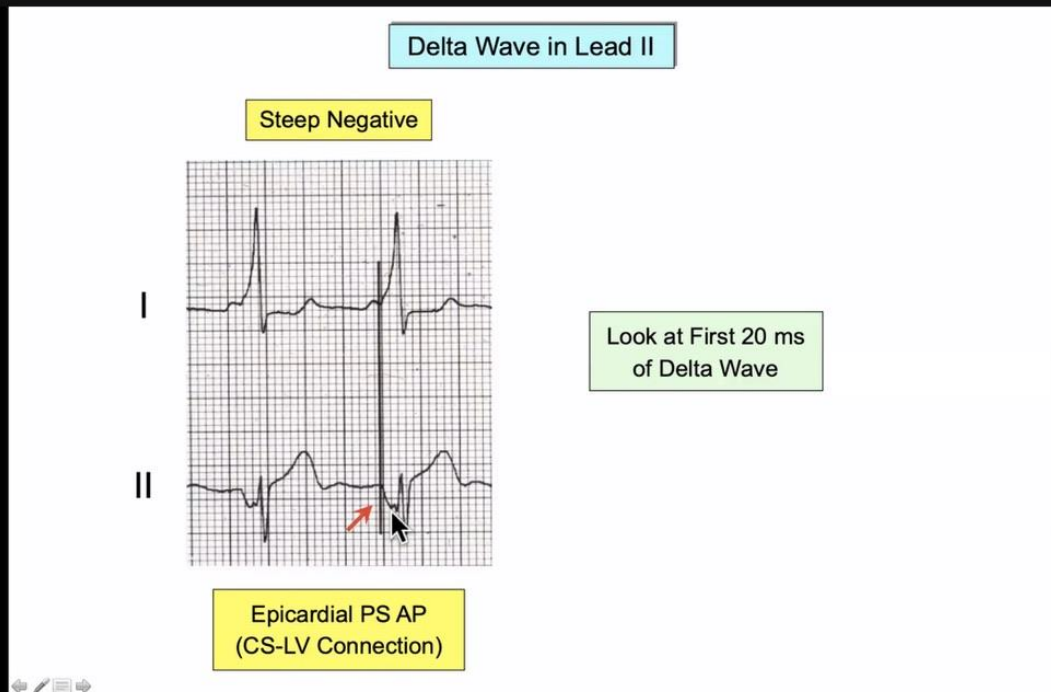
Retrograde
Conduction



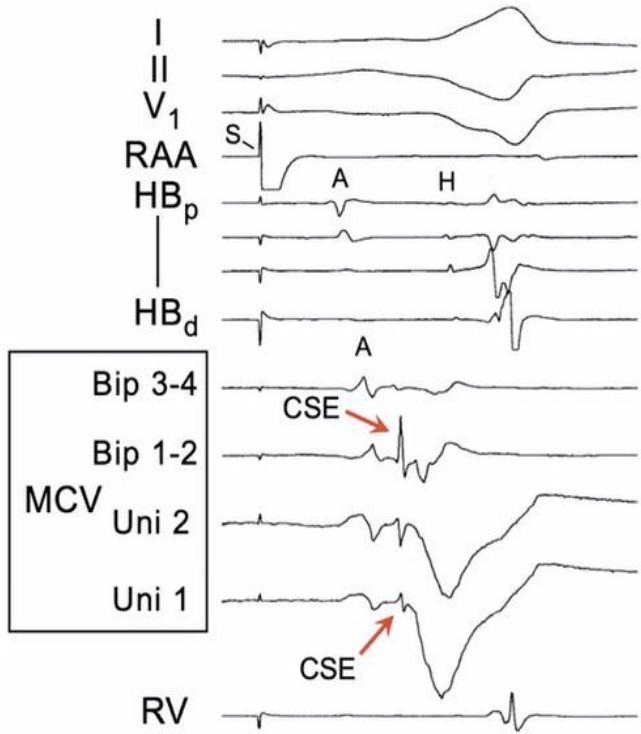
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SUSPECT FROM ECG

- Sharp delta wave in lead II
- This finding is only 70% sensitive and 70% specific.
- S in V6
- Look in full preexcitation

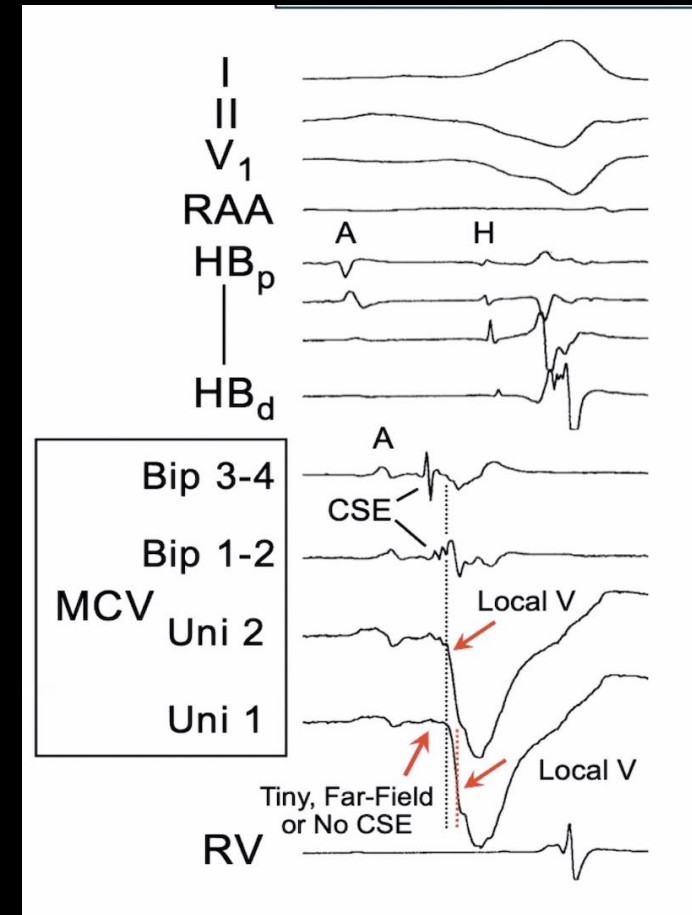


Catheter Pullback in MCV

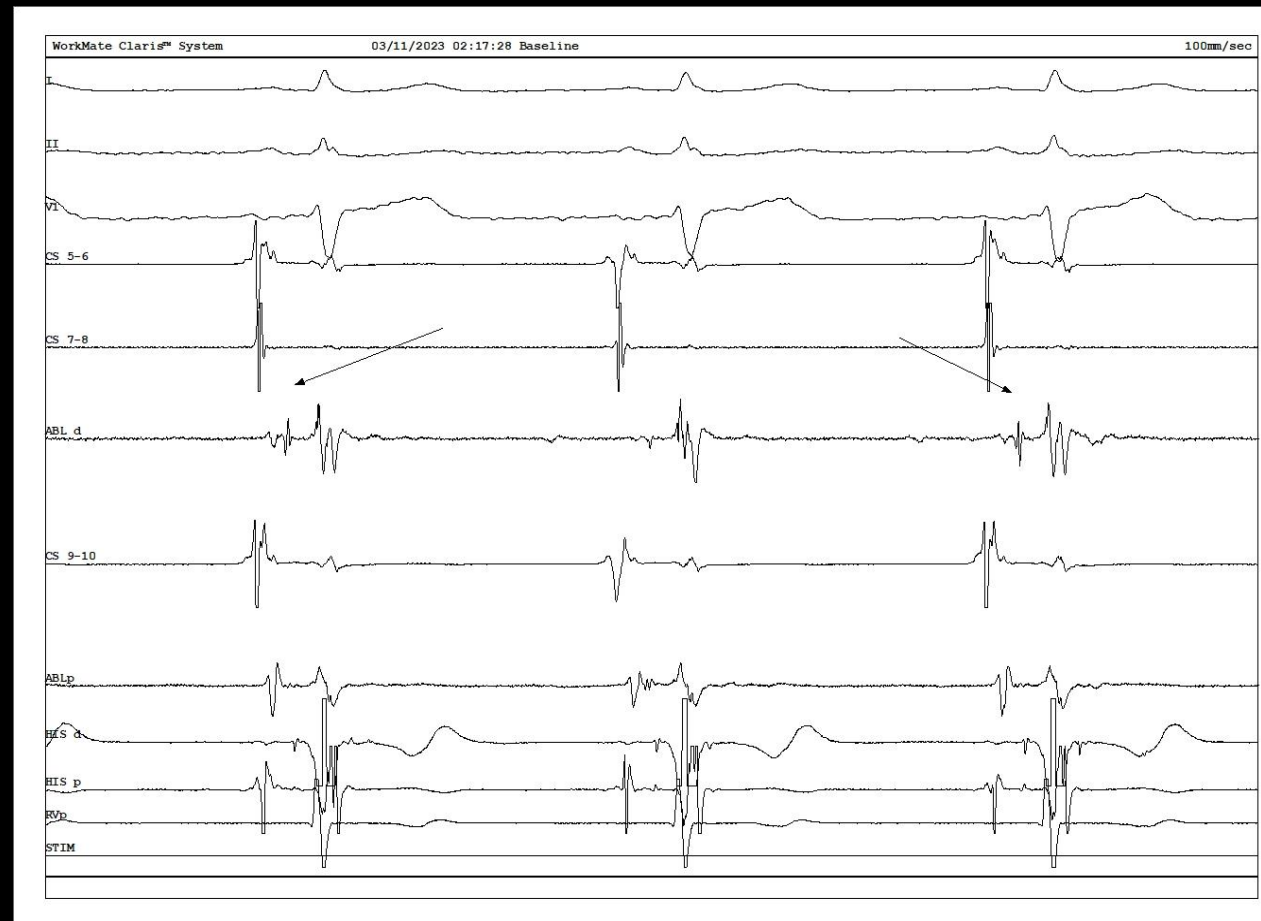


- Use irrigated catheter
- Look for CS muscular potentials at neck of diverticulum.
- Use cs catheters at floor and roof

ABLATION TECHNIQUES



CS POTENTIALS IN OUR CASE



THINGS TO LOOK FOR

- Start power at 15 W and increase to 25W.
- Hold at the power the pathway goes
- Give 2 min ablation- these pathways are notorious to come back again and again.
- Stop if impedance rises.
- CAG – before ablation as posterolateral branch of RCA crosses near the area .

CONCLUSION

- Redo SVT- needs to be planned before ablation by ECG, old records of ablation.
- Often its due to failure to recognize the type of arrhythmia or the location of pathway.
- In this case, upfront levophase CS angiogram was done suspecting CS abnormalities due to ECG features .
- Ablation in neck of CS diverticulum resulted in loss of preexcitation and no inducible tachycardia.
- Irrigated catheter ablation is very important for success.