



Parahisian PVC: Mapping and Ablation of Premature Ventricular Complexes (PVC)



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COI Disclosure

Chin-Yu Lin:

The authors have no financial conflicts of interest
to disclose concerning the presentation



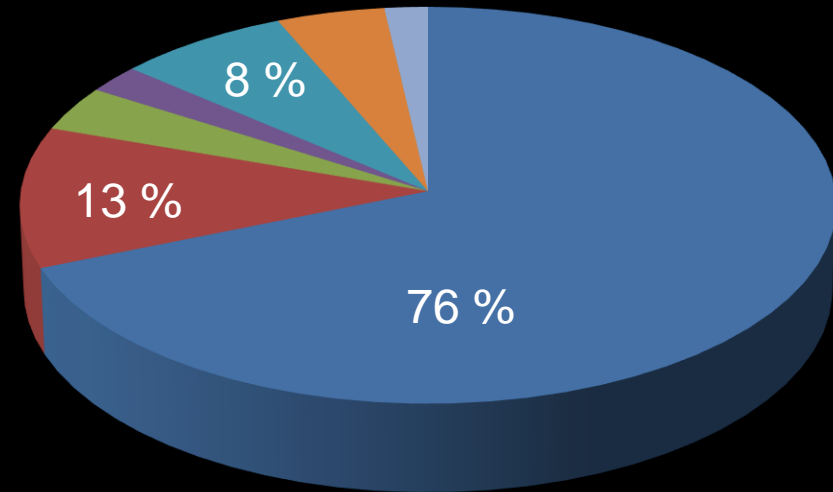
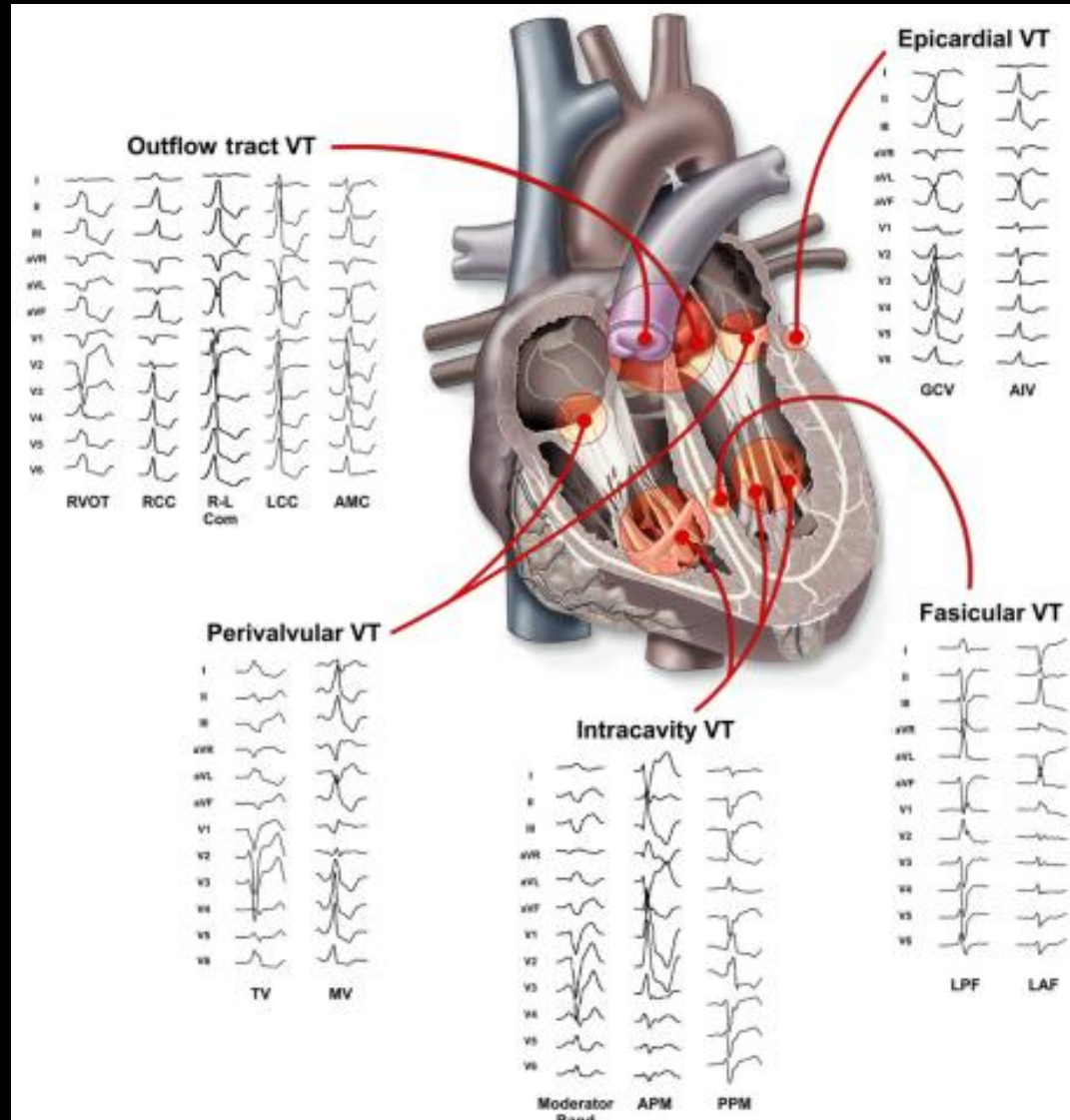
Disclosure

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- Other:none



Prevalence of idiopathic VA



- RVOT/LVOT
- Fascicular VT
- Papillary muscle
- Moderator band
- Tricuspid annulus
- Mitral annulus
- Epicardial VT

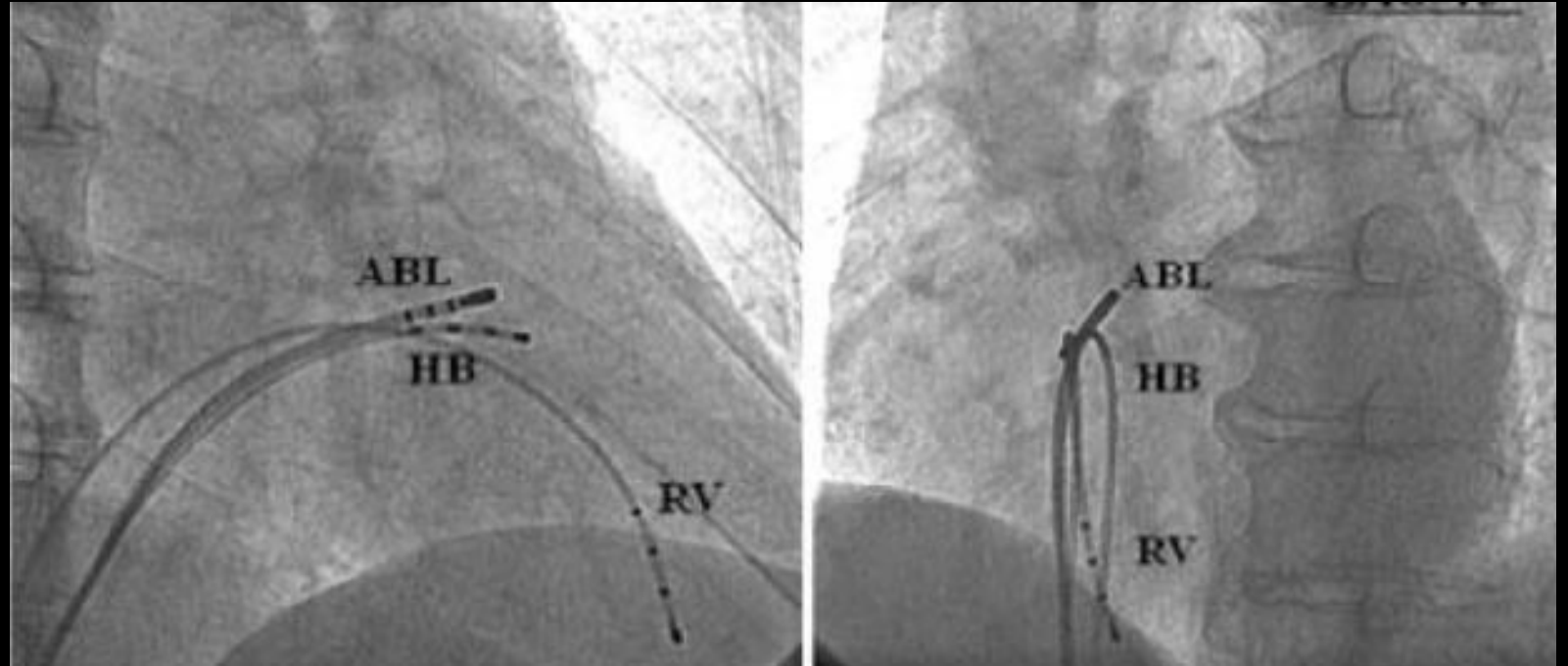
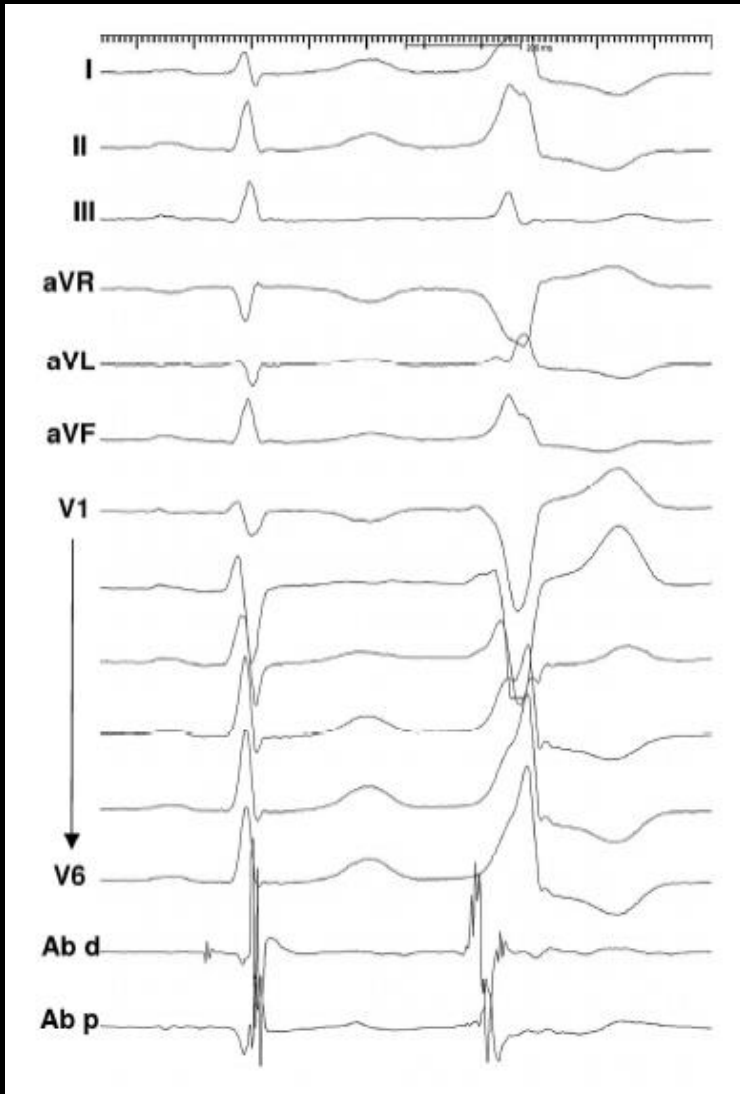
Unusual Idiopathic VA targets

- LV summit VA
- GCV/AIV VA
- Epicardial VA
- Intramural VA
- Papillary muscle VA
- Moderator band VA
- Parahisian VA

Definition of Parahisian PVC

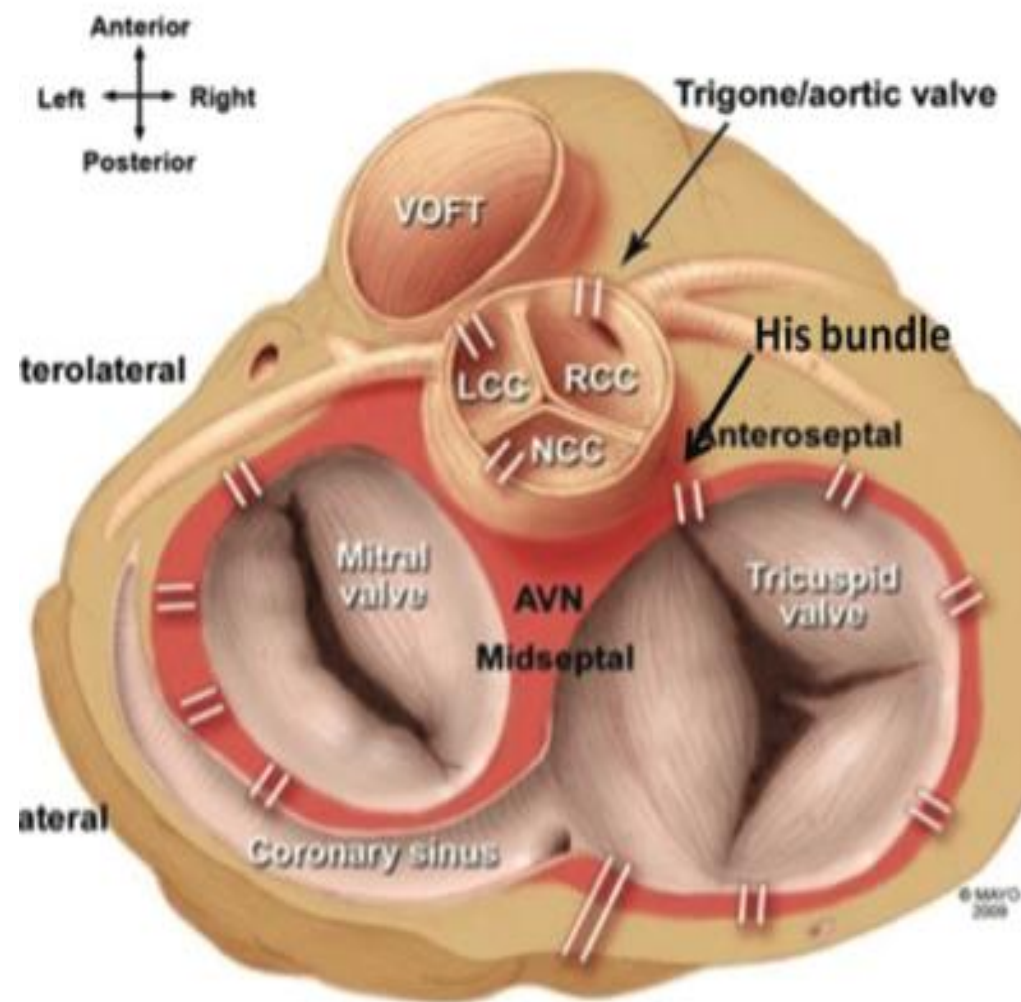
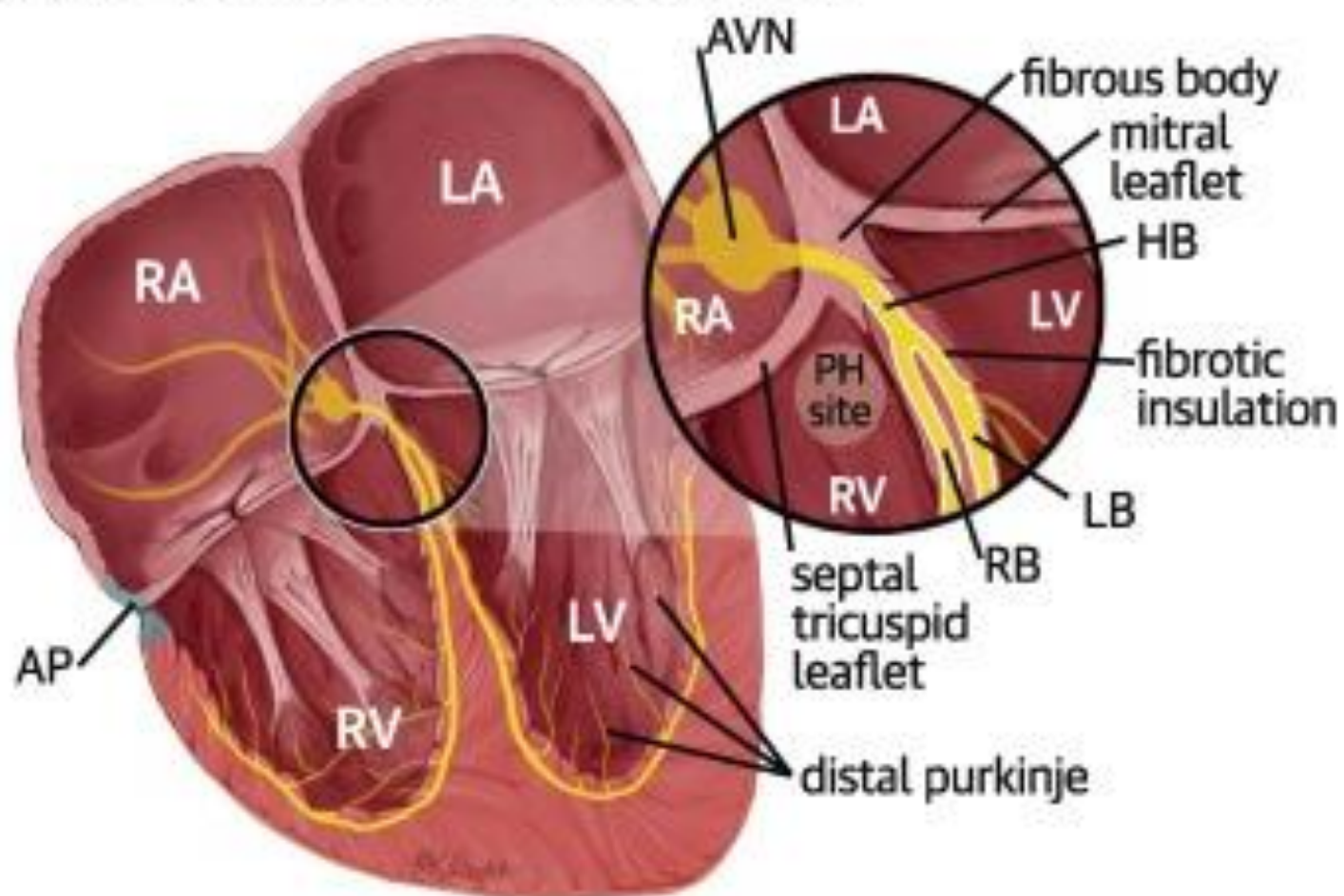
- We define parahisian VAs as those in which earliest activation, after complete mapping, including neighbor structures, is recorded in presence of a His potential or within 10 mm-distance from the His cloud

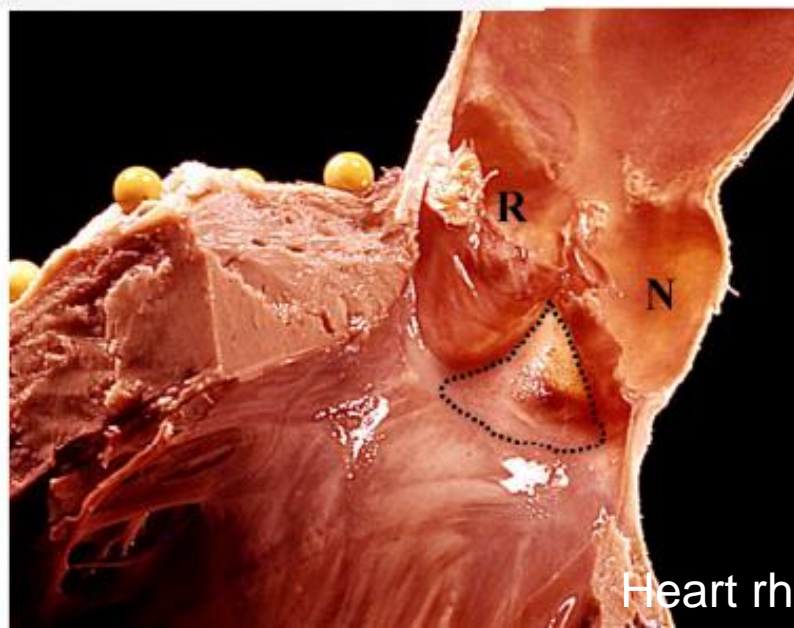
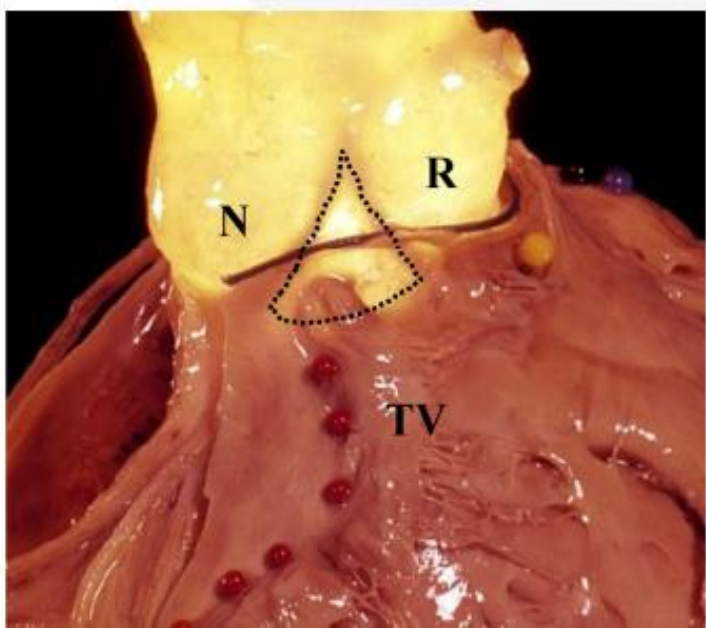
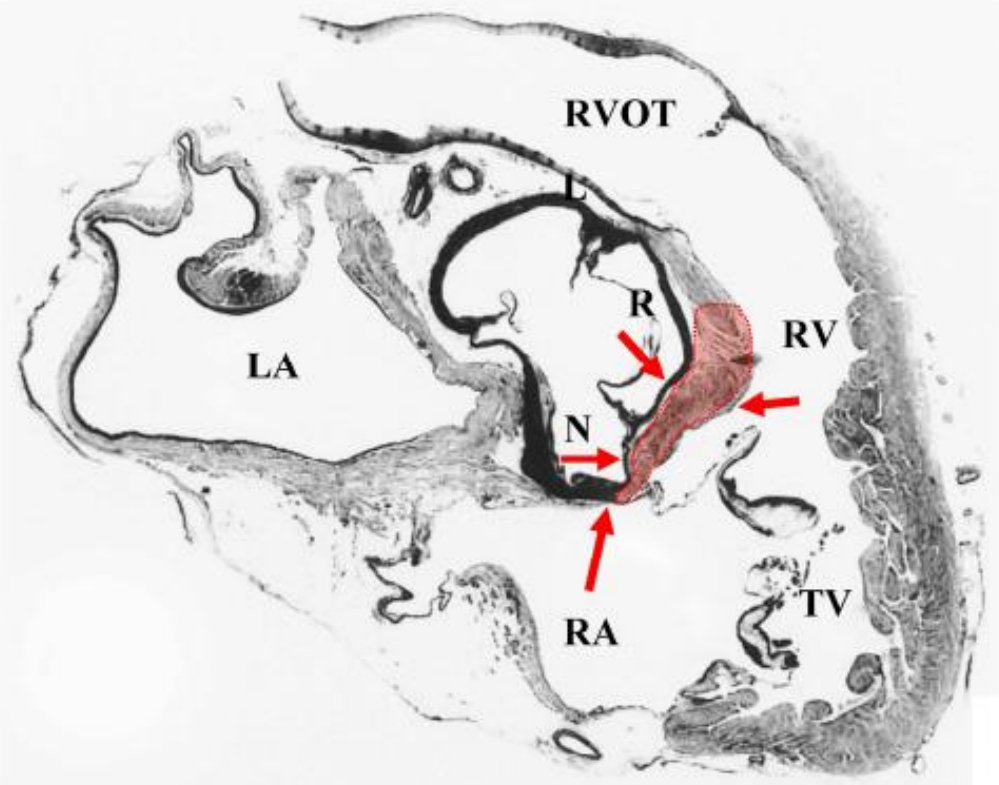
Catheter ablation



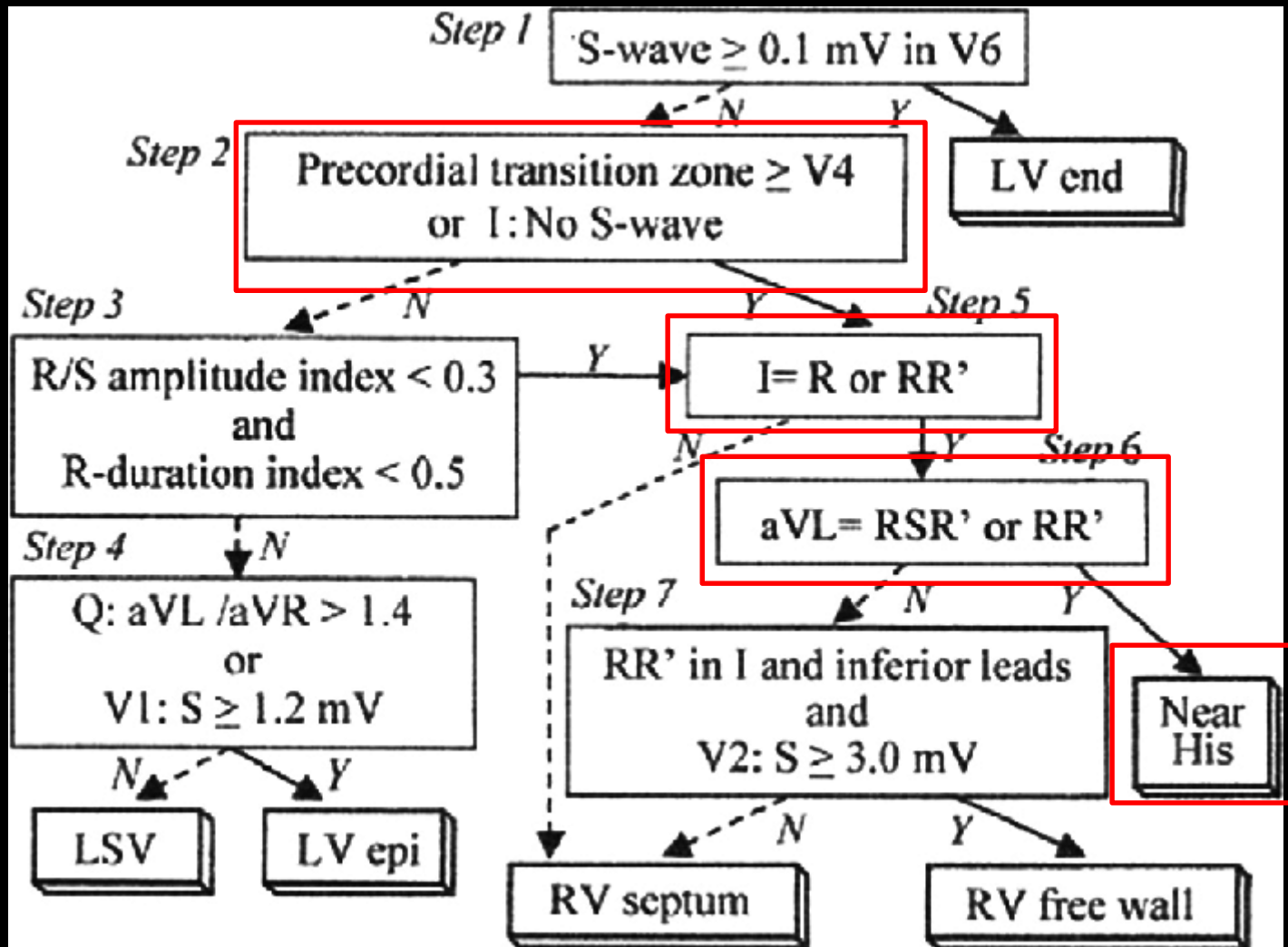
Parahisian area

A. Anatomical features of the PH site





ECG Algorithm [for OT case]



ECG

A. Positive II and III: Suggests origin from the outflow tracts and top of atrioventricular valves

Positive lead I: Structures rightward from the midline

- a. Posterior RVOT
- b. RCC
- c. Para-Hisian
- d. Top of the TV

LBBB, transition at or after V_3 , QS in V_1

LBBB, V_2 or V_3 transition (V_2 transition ratio ≥ 0.6), QS in V_1

LBBB, typically V_2 or V_3 transition, QS in V_1 , R in aVL (vs negative in the RVOT), II may be negative, narrow QRS

LBBB, variable transition, QS or rS in V_1 , positive aVL (vs negative in the RVOT), II may be negative

Negative lead I: Structures leftward from the midline

- a. Anterior RVOT
- b. LCC
- c. AMC
- d. Anterolateral MV
- e. LV summit

LBBB, transition at or after V_3 , QS in V_1

LBBB or RBBB, V_1 or V_2 transition, rS, R, or multiphasic pattern in V_1

RBBB, positive concordance, qR in V_1

RBBB, positive concordance, R or Rsr' in V_1

RBBB or LBBB with V_2 or V_3 transition, taller R wave in III than in II, pseudo-delta wave and/or MDI > 0.55 , V_2 "pattern break"

Exceptions are 2 non-outflow tract structures:

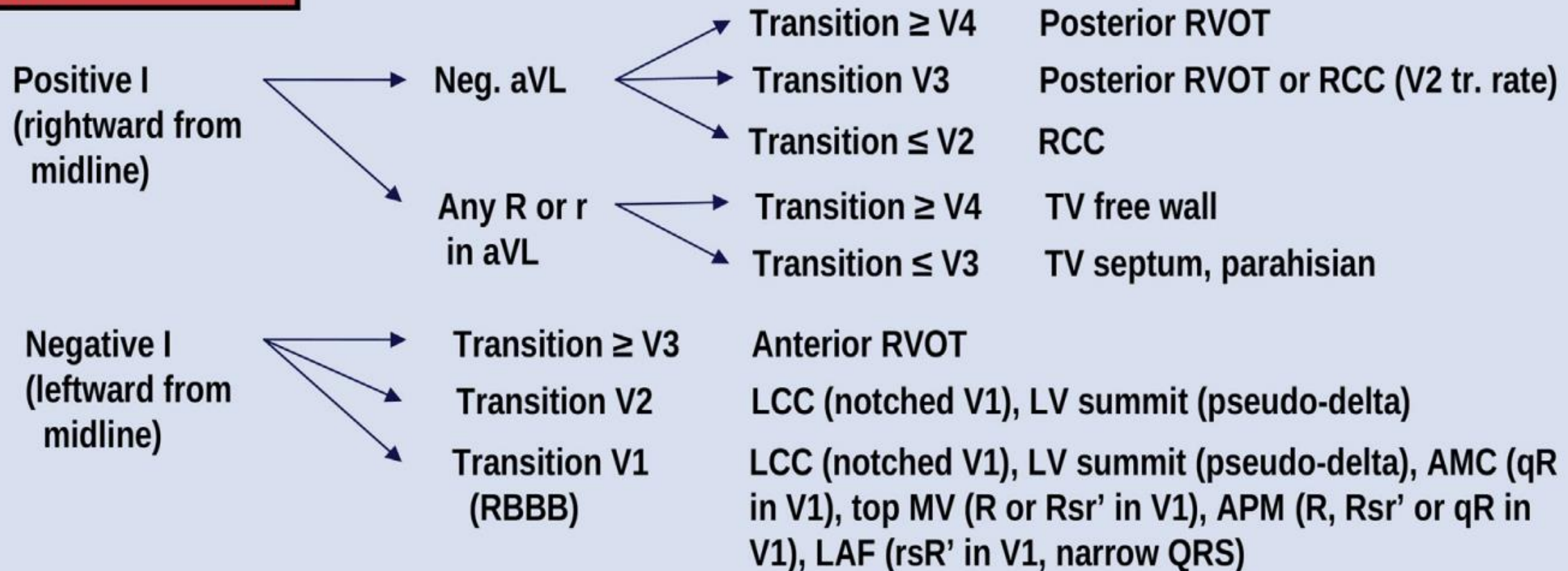
- a. Left anterior fascicle
- b. Anterolateral PM

RBBB, rsR' in V_1 , narrow QRS, right axis

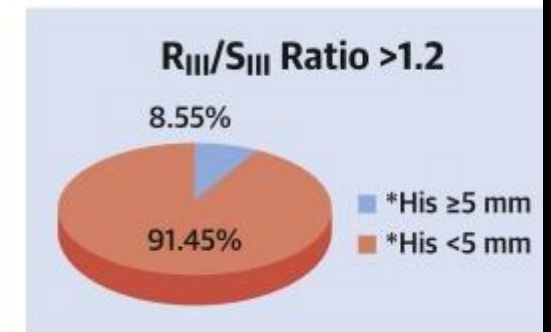
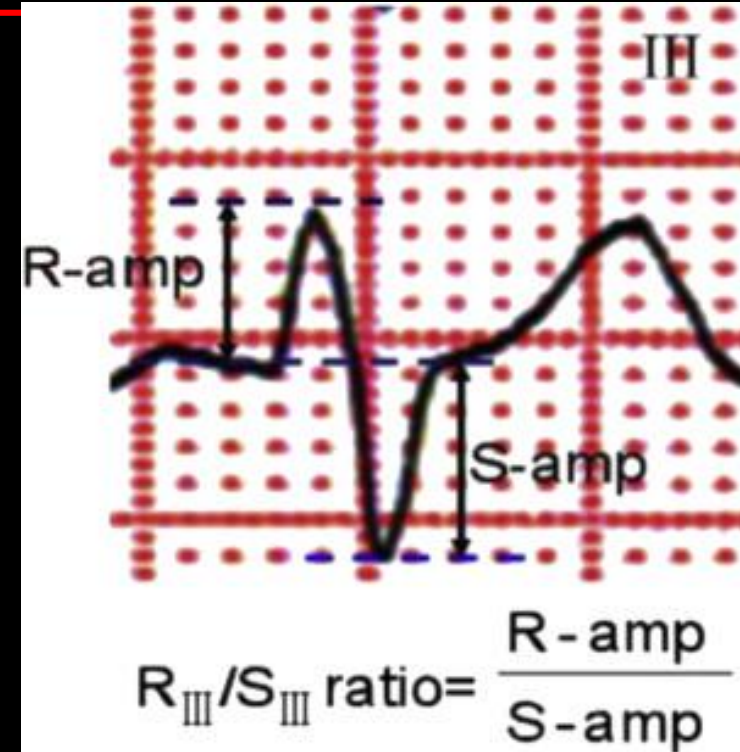
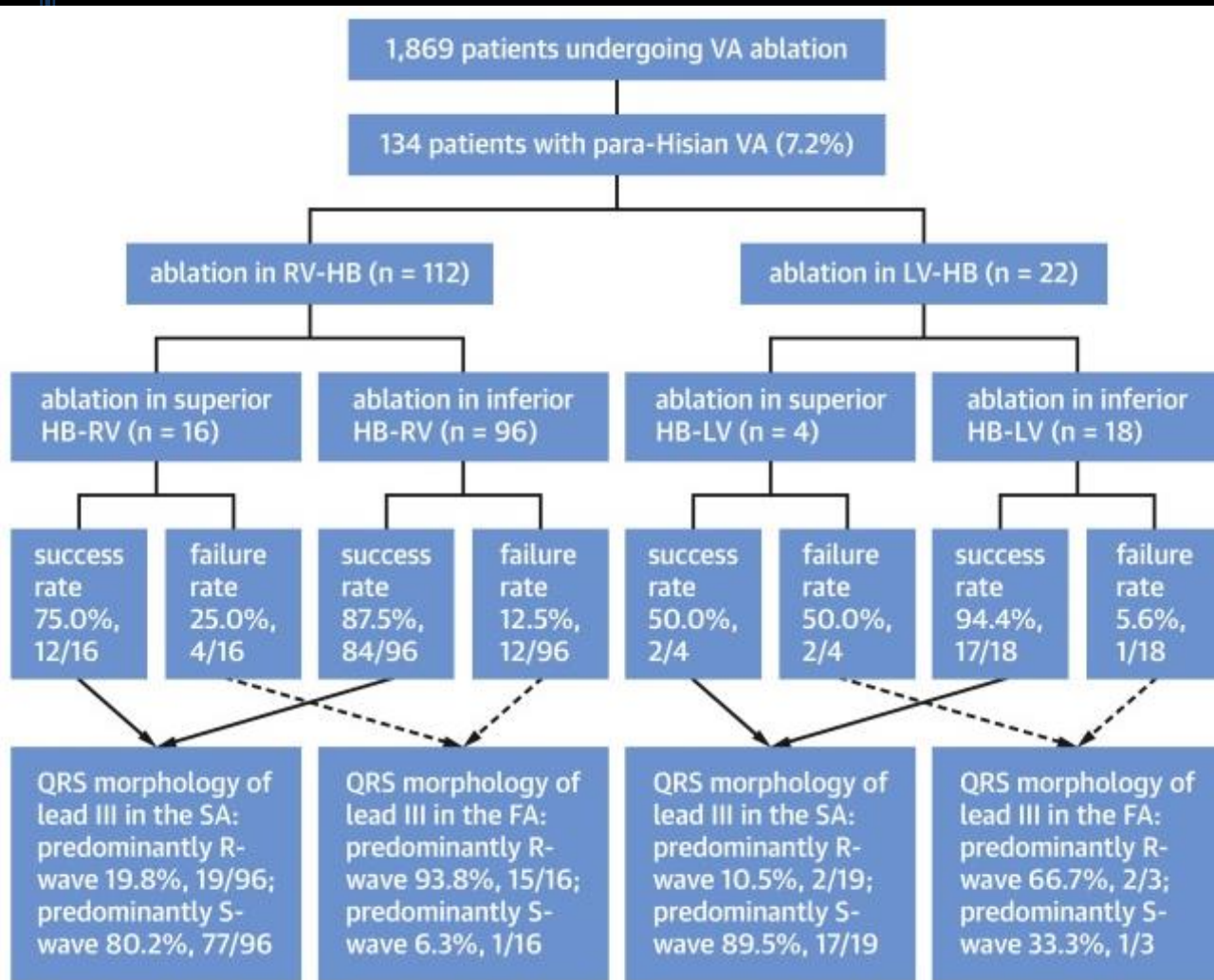
RBBB, R, Rsr', or qR in V_1 , late R/S transition, II may be negative

ECG

Inferior axis (positive II and III)



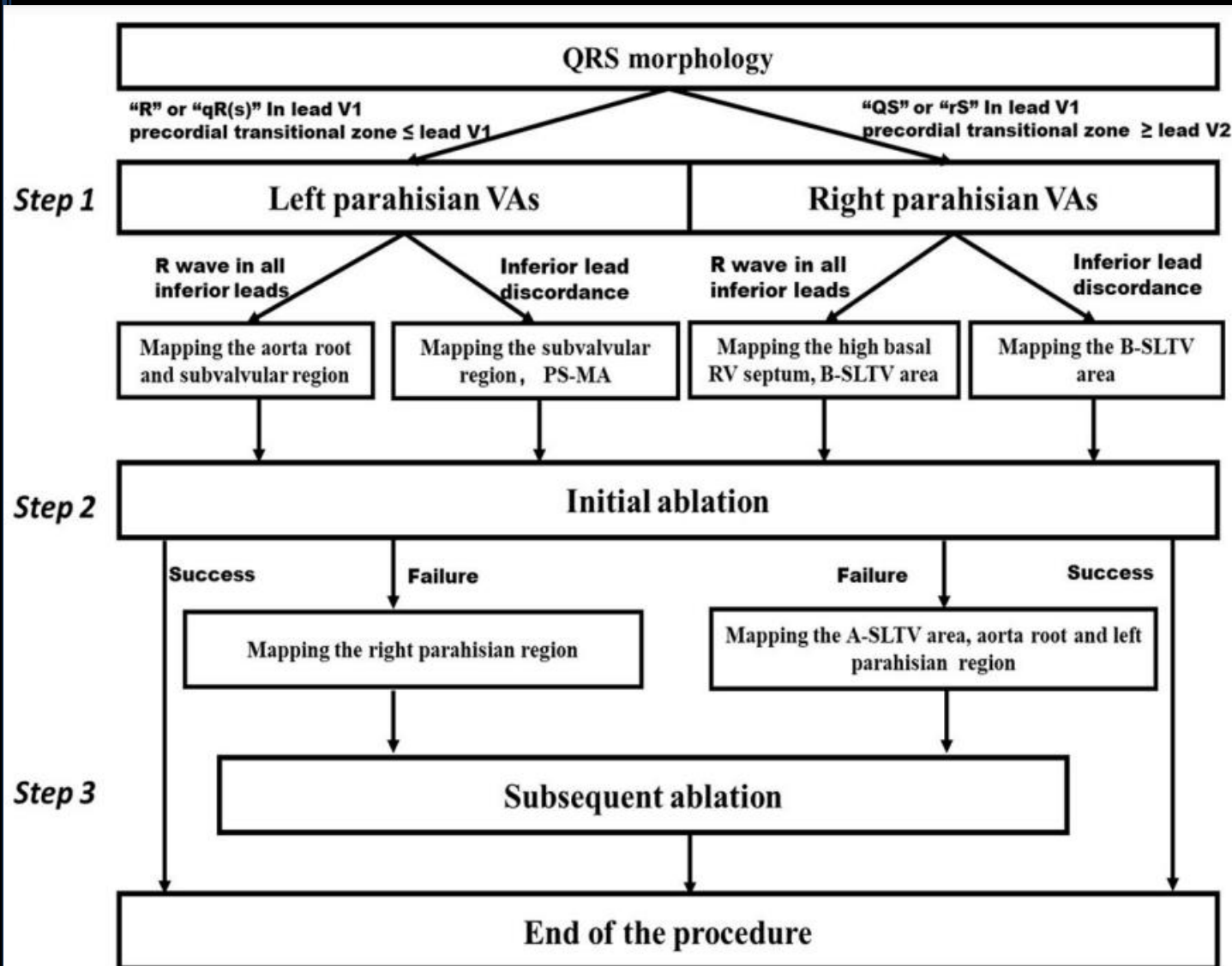
Prediction of success



Induction of PVC/VT

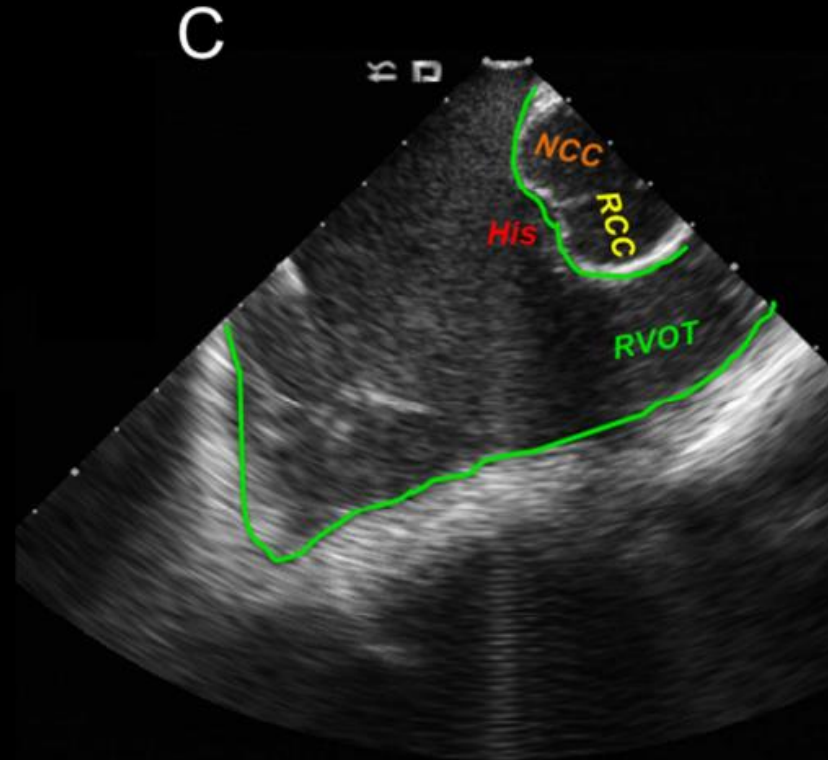
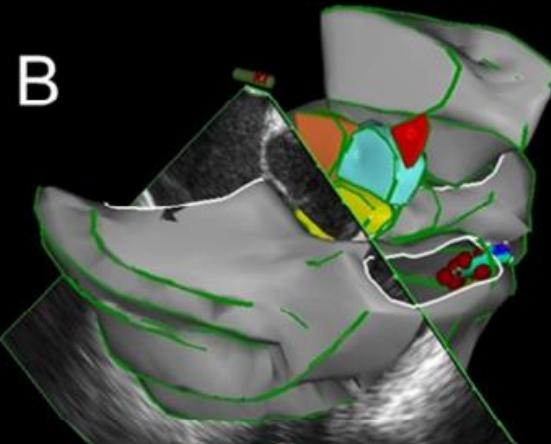
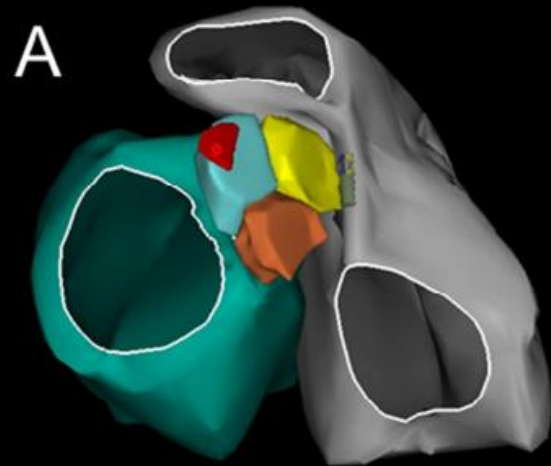
- If no PVC present
 - Postpone the procedure
- If PVC after isuprel or spontaneously
 - LAT
 - Pacemap

Mapping of para-his PVC

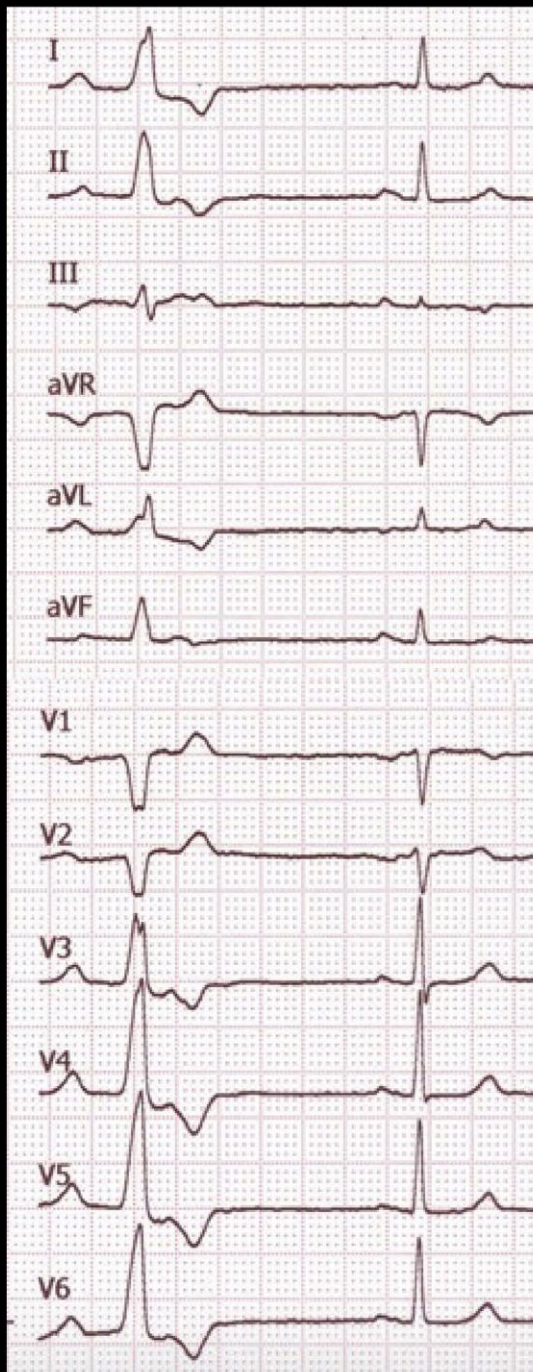
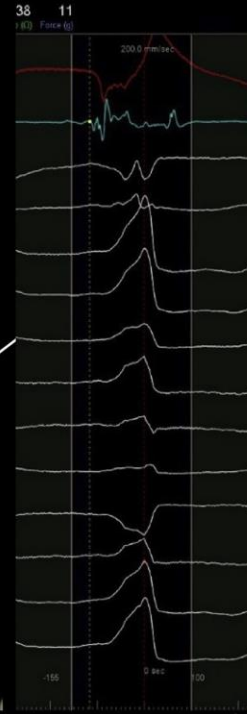
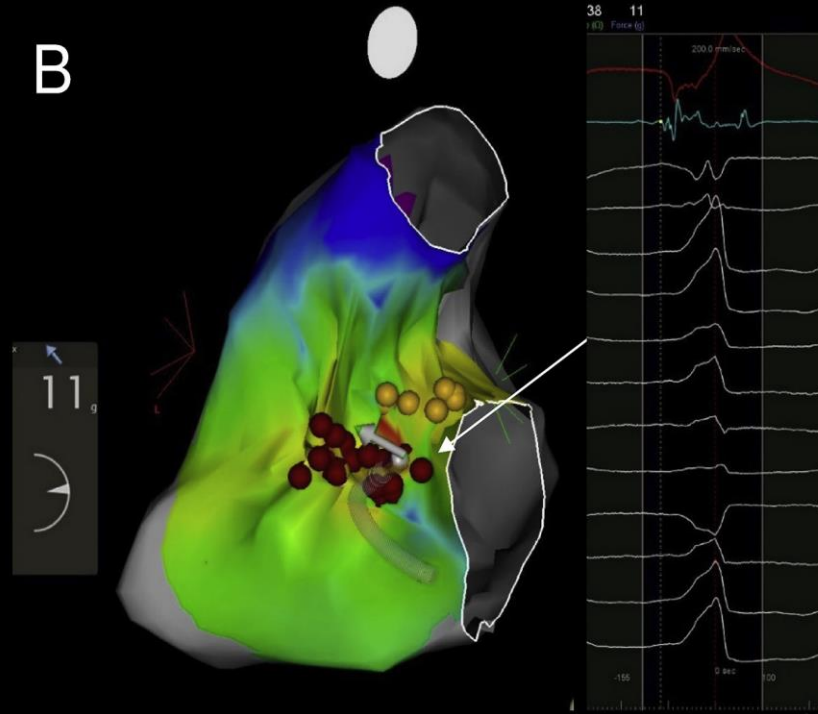
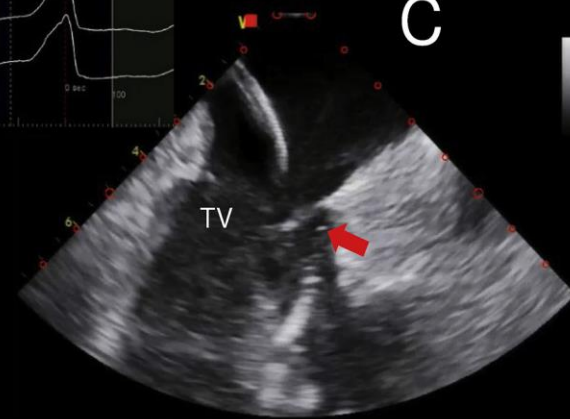
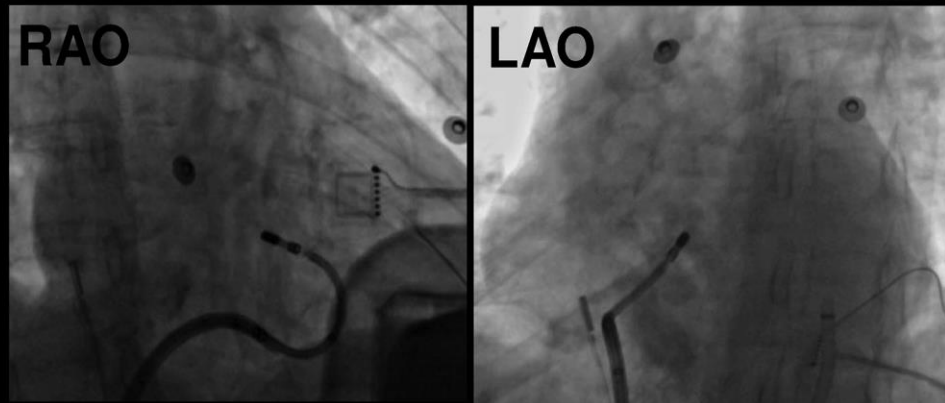


Strategy for parahisian PVC

- Creation of activation map from His and para-his area

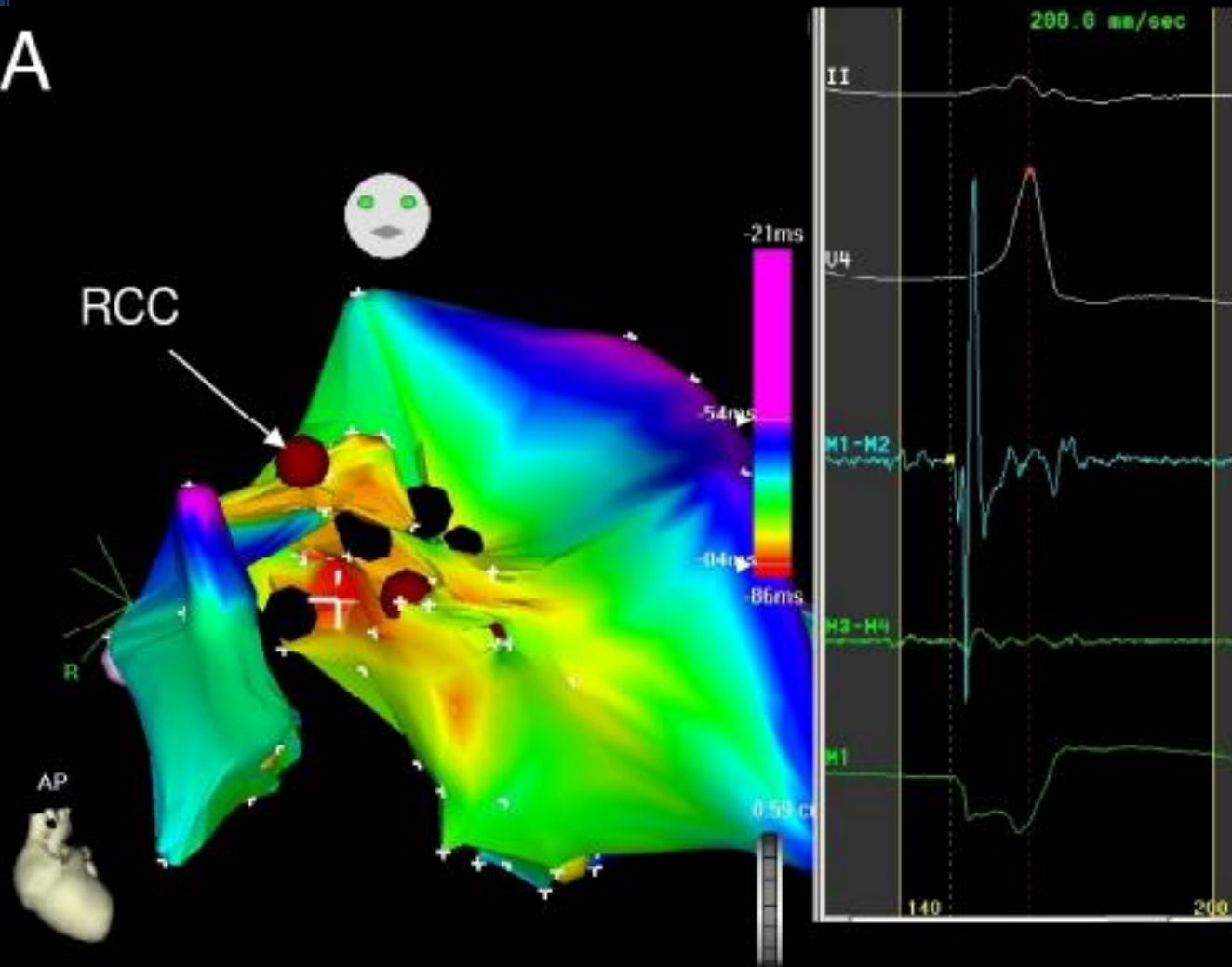


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- Map in detail all the neighbor structures before any attempt of delivering ablation
 - May found earlier potential rather than His area
 - It's relative safe to do ablation in adjacent site despite worse LAT signals

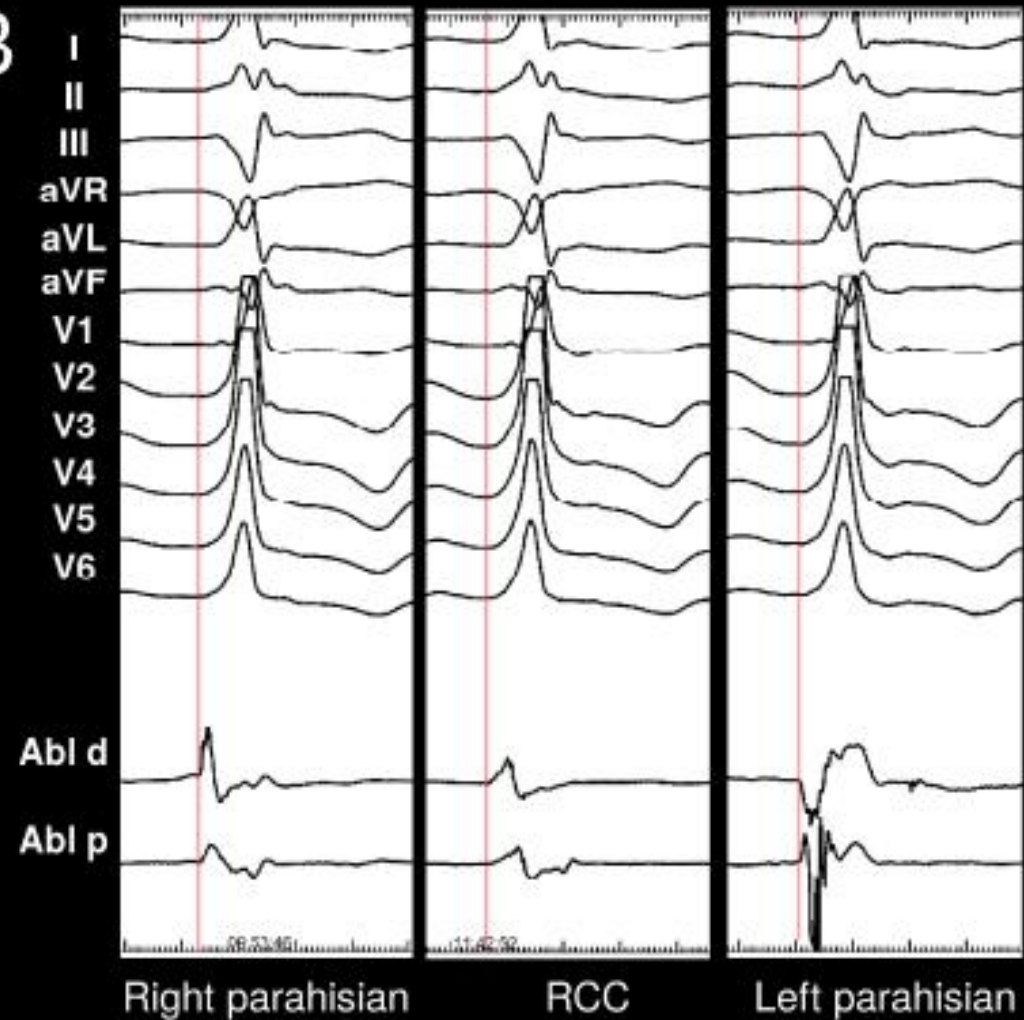
A**B****RV side****C****D**

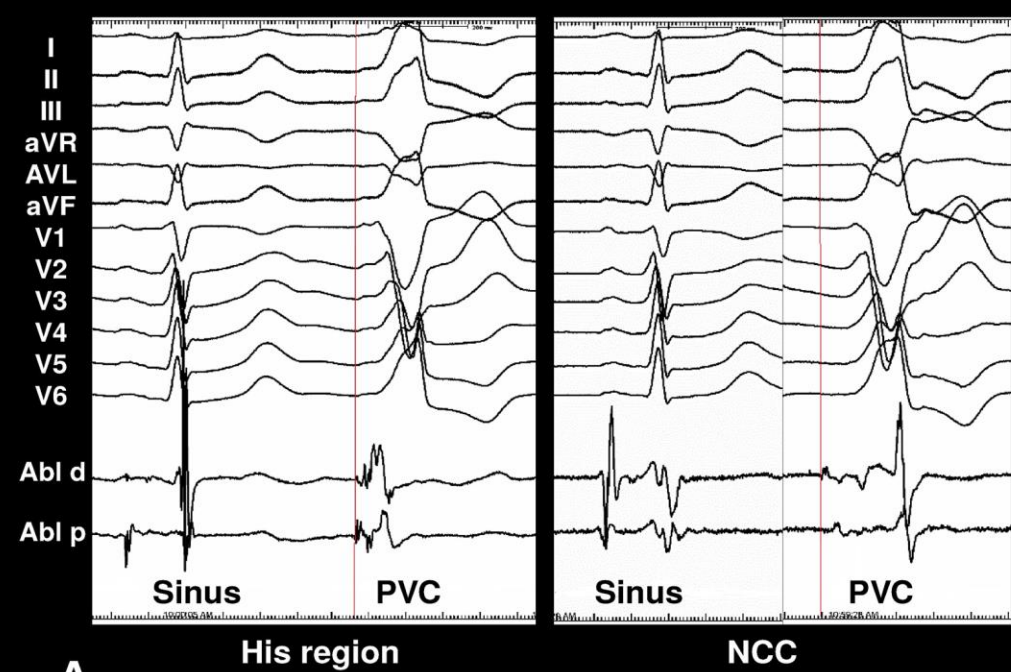
LAT map of parahisian area

A



B

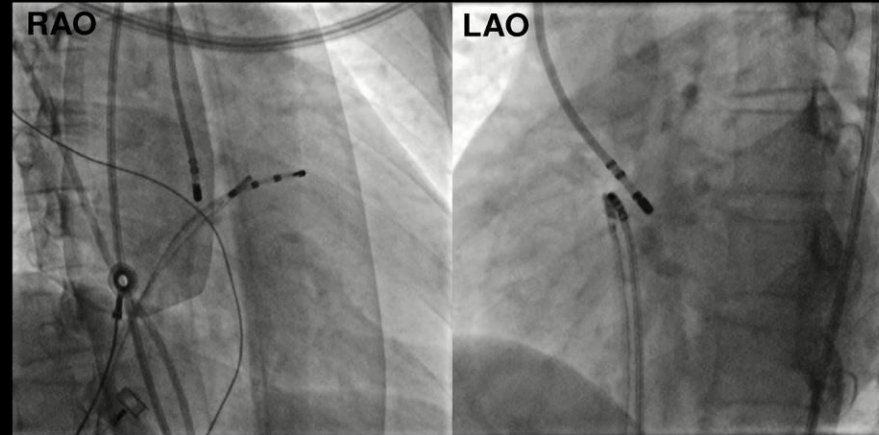




A

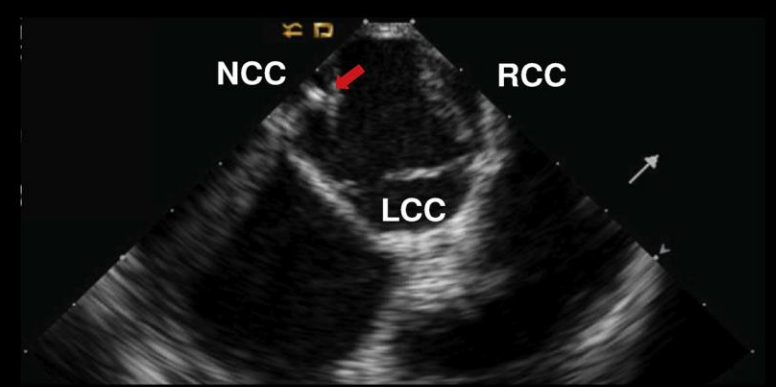
His region

NCC



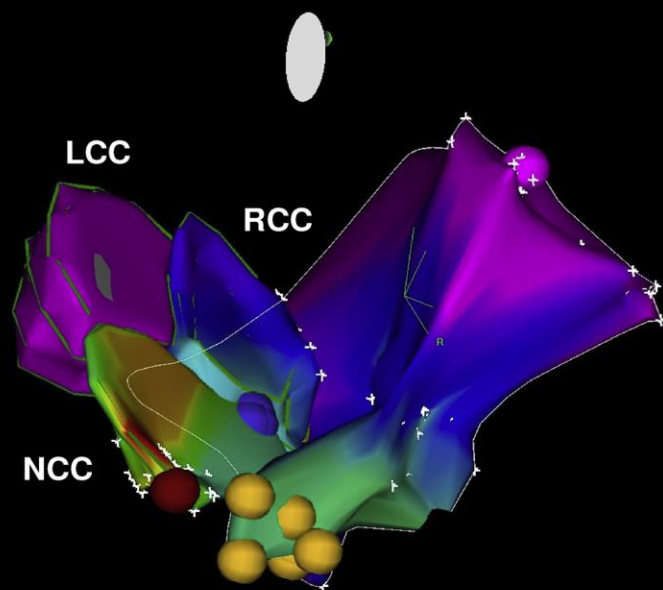
NCC

C

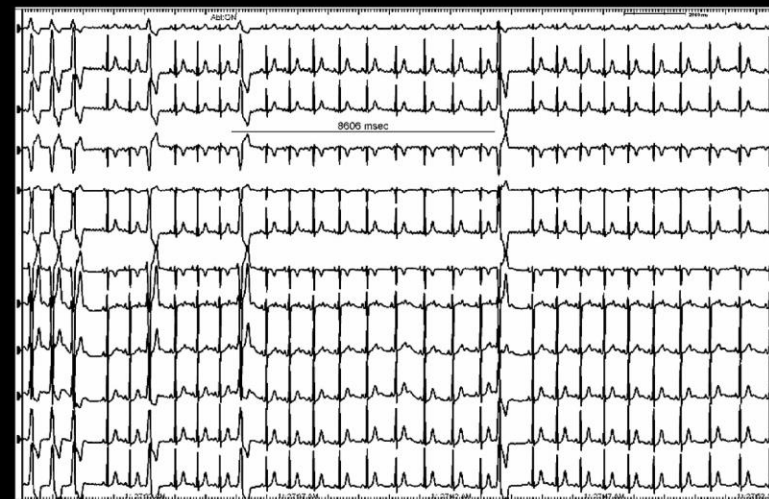


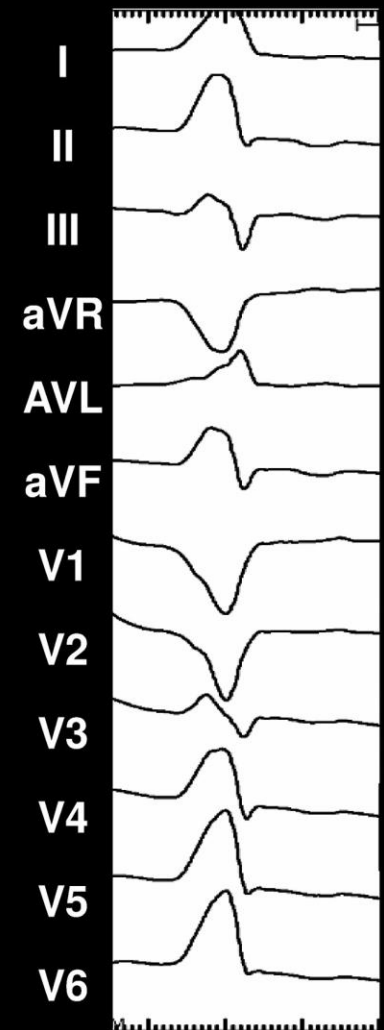
D

B

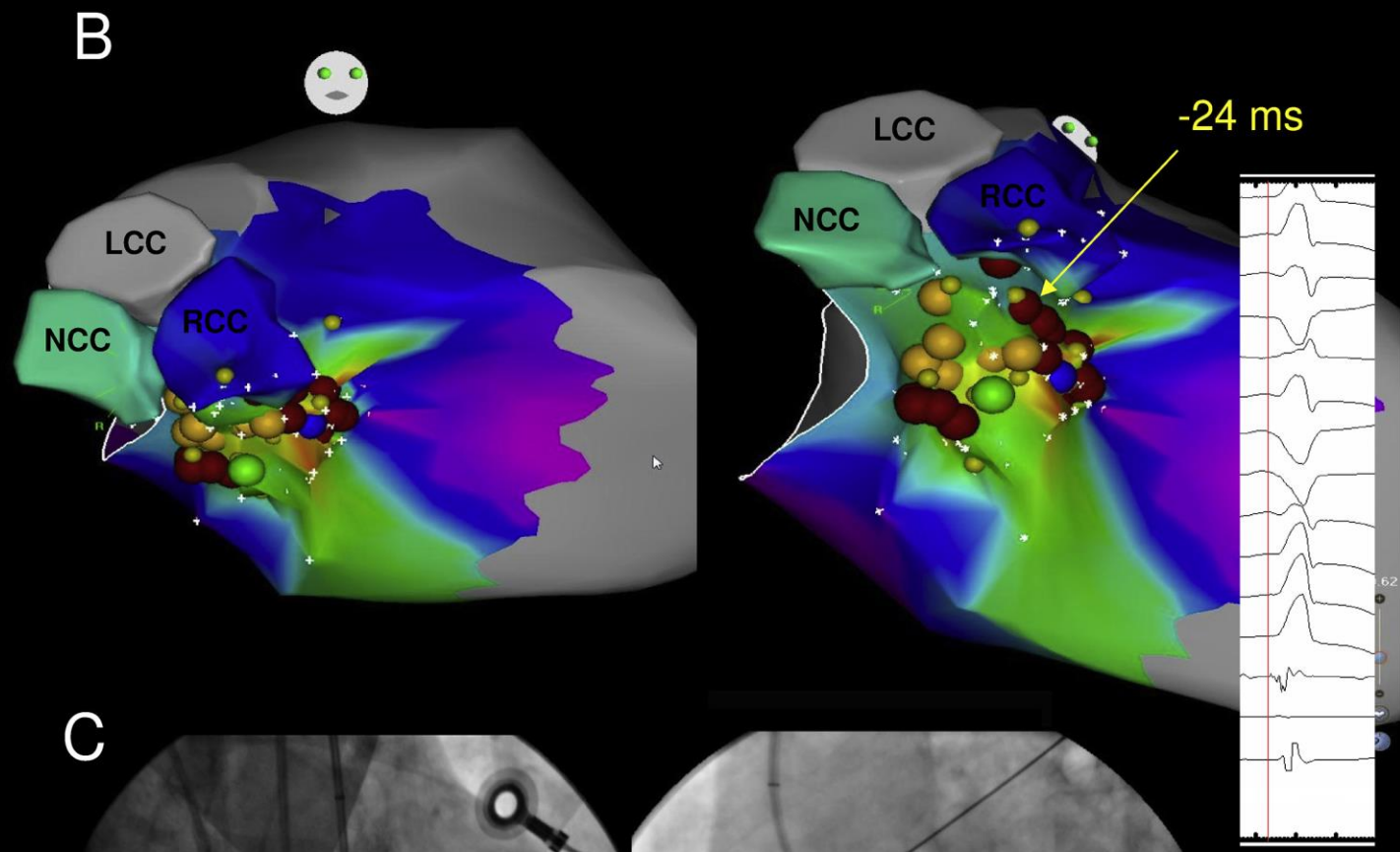


E

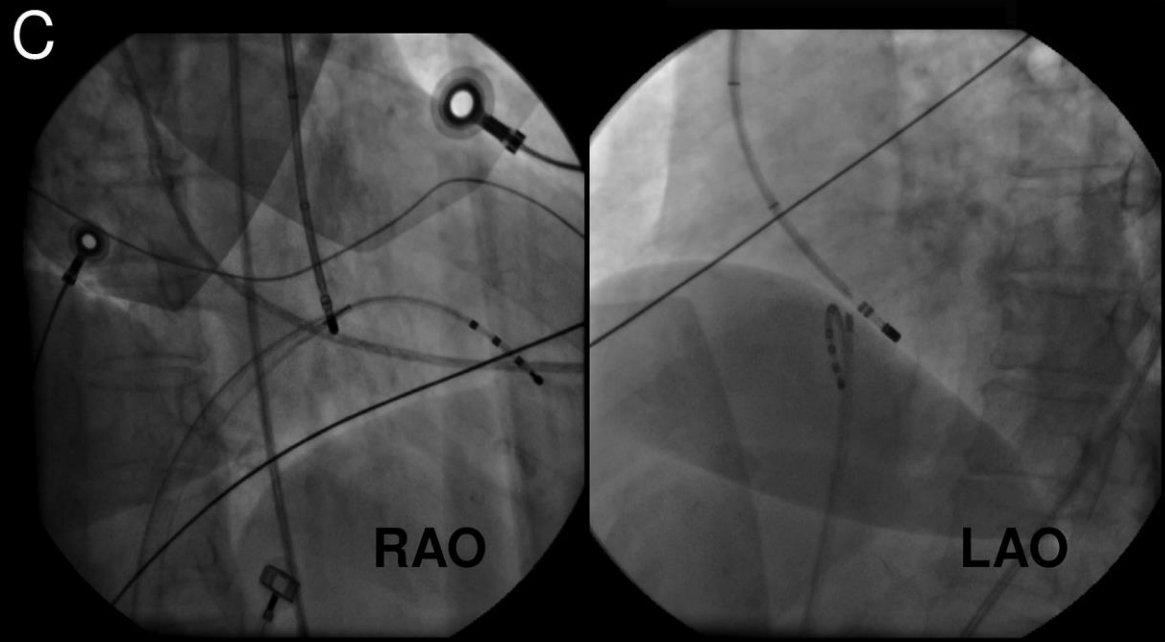




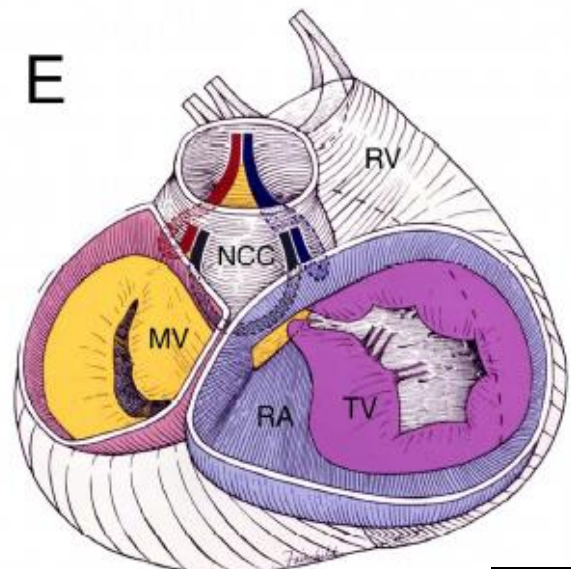
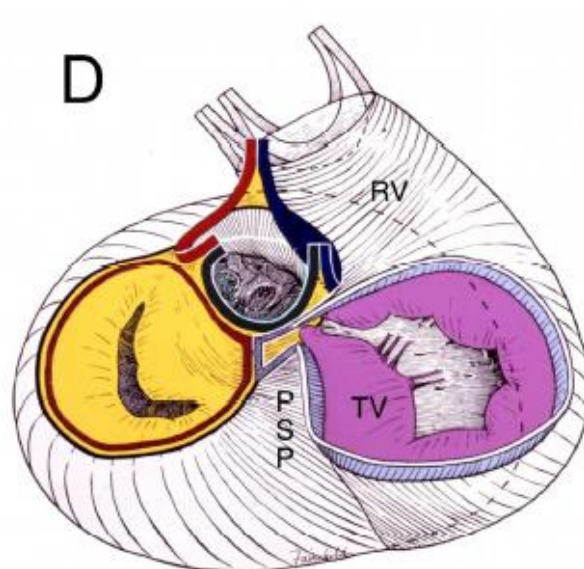
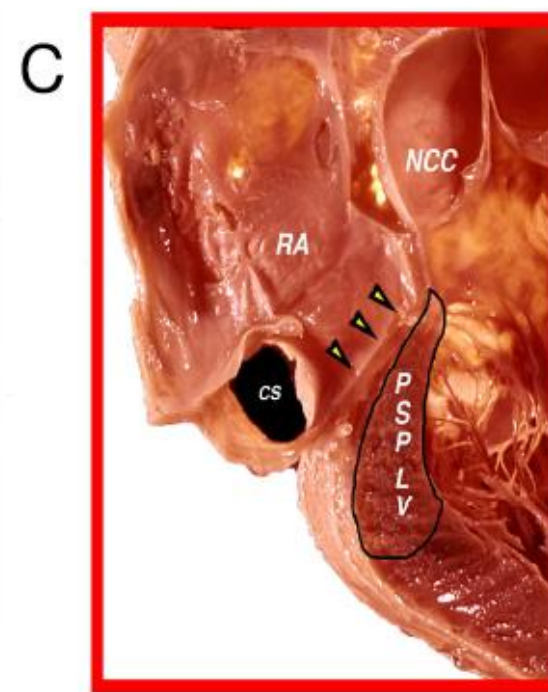
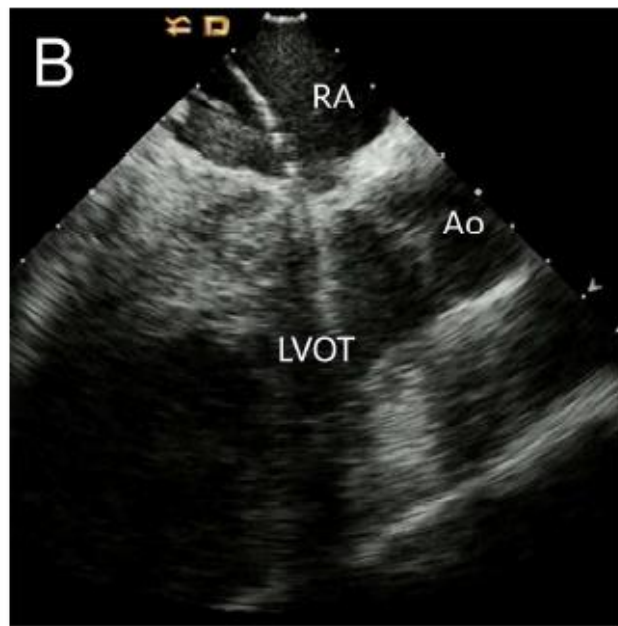
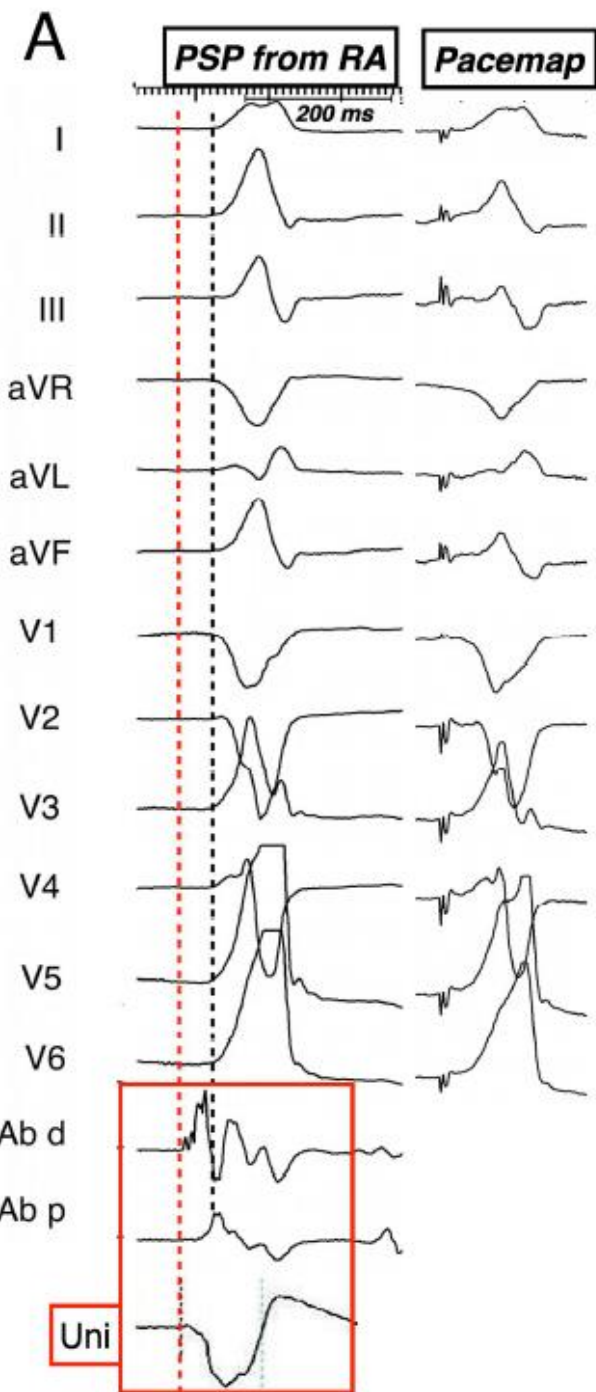
A



LV



C



Posterior-superior process of the LV

Ablation

- Targets for RF delivery include earliest local bipolar activation preceding the QRS and the presence of a QS pattern in the unipolar electrogram of the ablation catheter, usually associated with good pacemap
- A distance $> 5\text{mm}$ to largest HIS signals is acceptable
- If His signals presented in the target site
 - Start from adjacent RCC/NCC for 10 second
 - No effect \rightarrow stop
 - Suppression \rightarrow continue for 60 second
 - High current pacing to D/D far/near field signal

Energy setting

- Start from low power and increase gradually without AV node injury
- If the His signal was seen in the ABL catheter, consider to use cryoablation
- A angiography was required before RCC ablation.

Conclusions

- The location of parahisian PVC could be predicted from 12 lead ECG
- Systemic approach from RA/RV/Cusp/LV should be considered before applying the energy
- Detailed mapping of neighbor structures is essential
- Be careful about the junctional rhythm, PR prolong, and AV block during ablation
- Cryoablation is an alternative choice