

# Successful Ablation of Accessory Pathways in Patients with Anatomical Abnormalities

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# Anatomical Abnormalities asso. with AP

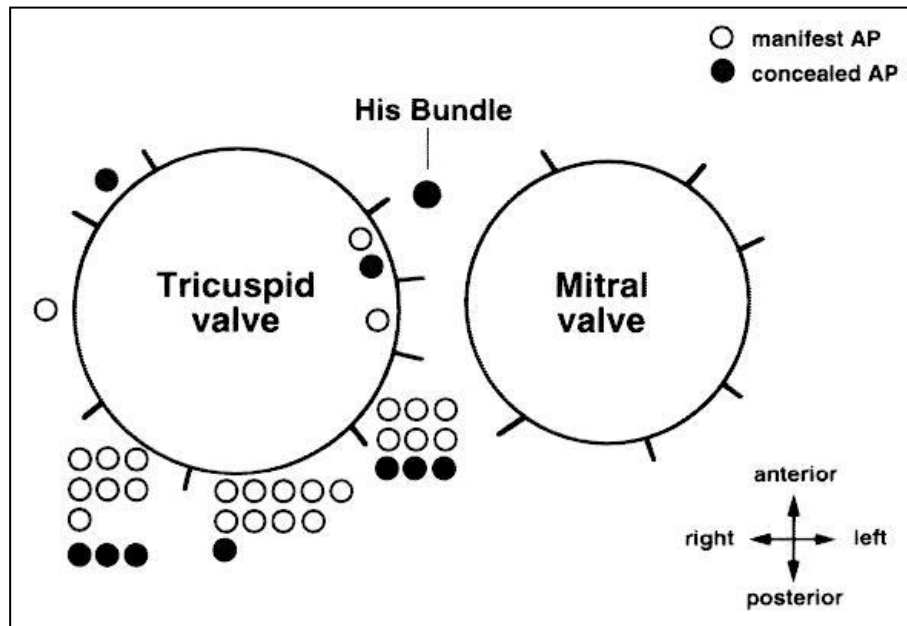
- Ebstein's anomaly
- Congenital heart diseases
  - Patients with Fontan circulation
- Accessory pathway itself
  - slant pathway
  - atypical accessory pathway

# Ebstein's anomaly

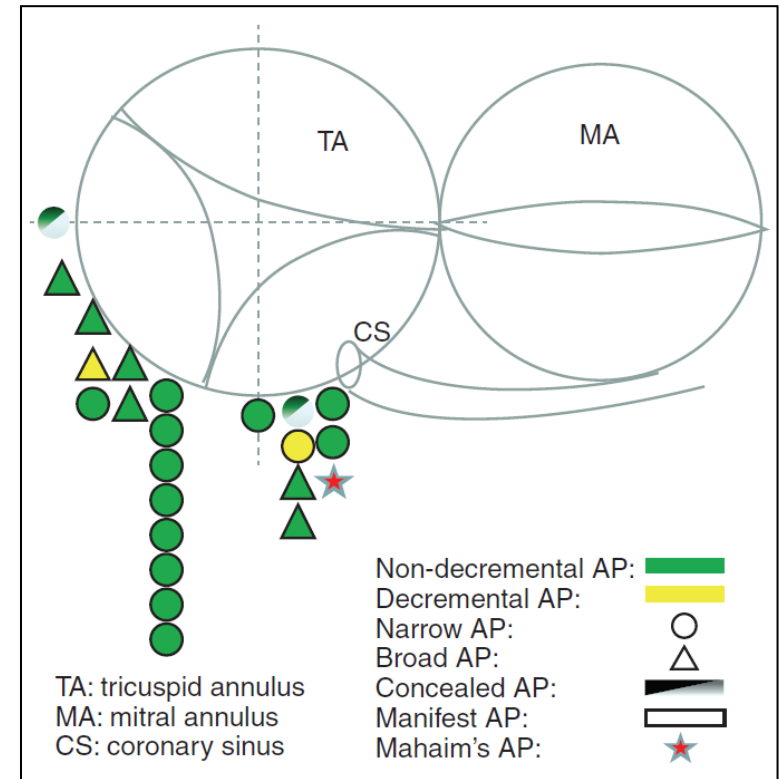
# Ebstein's anomaly & PSVT

- Accessory pathway: 20-30% of Ebstein
- ASD, PFO: 80-94% of Ebstein
- Usually multiple (6-36%), unidirection  
(antegrade)
- AV or atriofascicular

# Accessory pathways in Ebstein anomaly

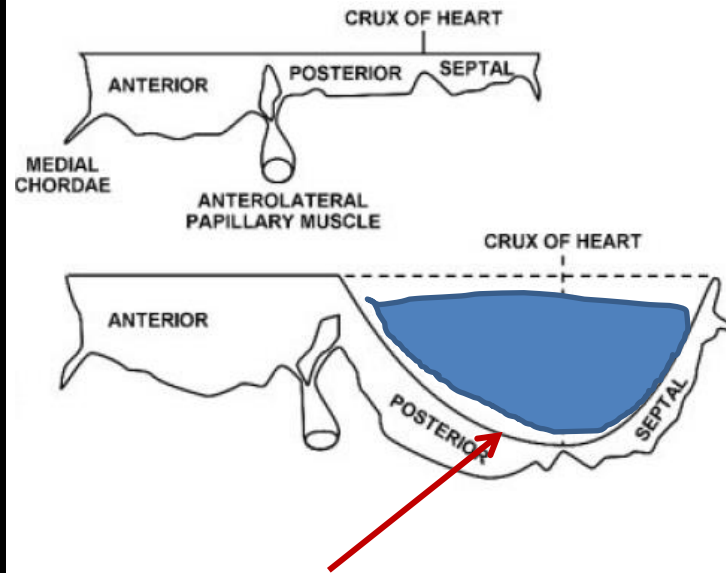
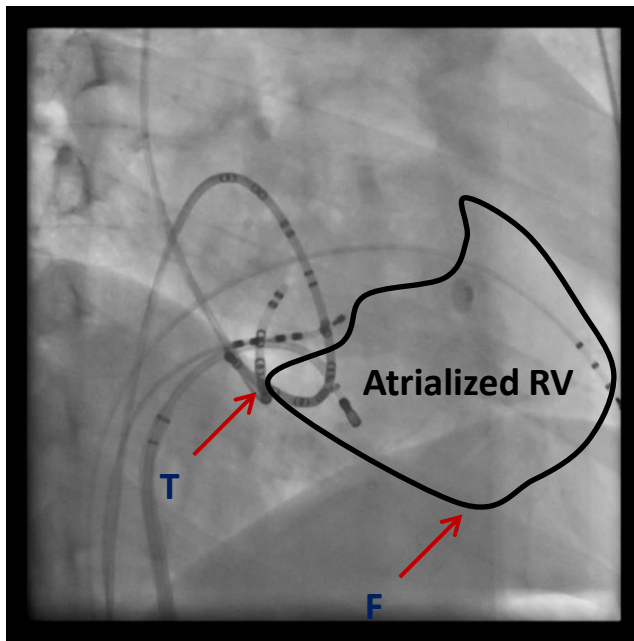


*C Riccardo, et al. Circulation 1996*



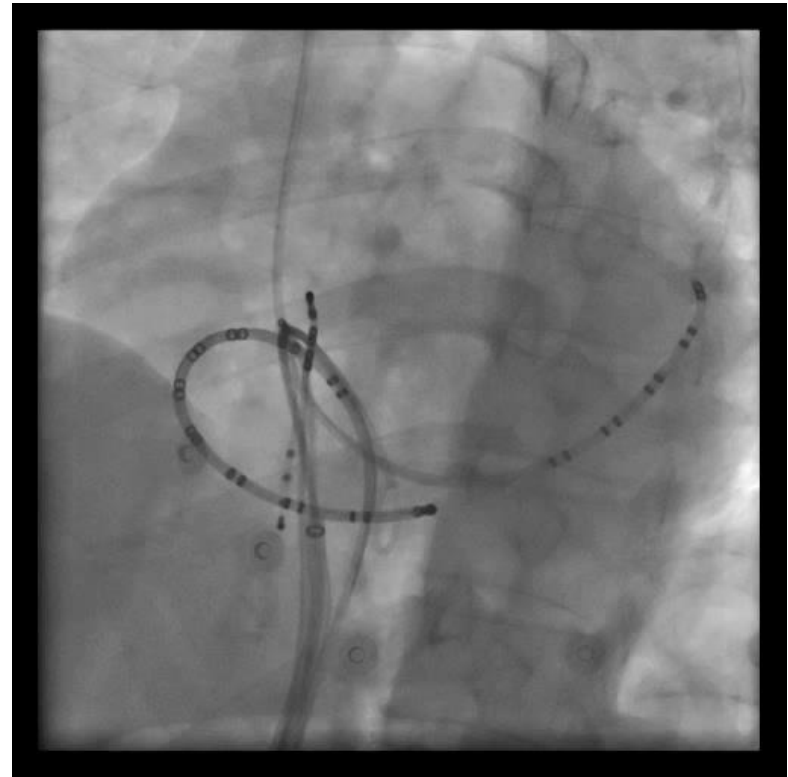
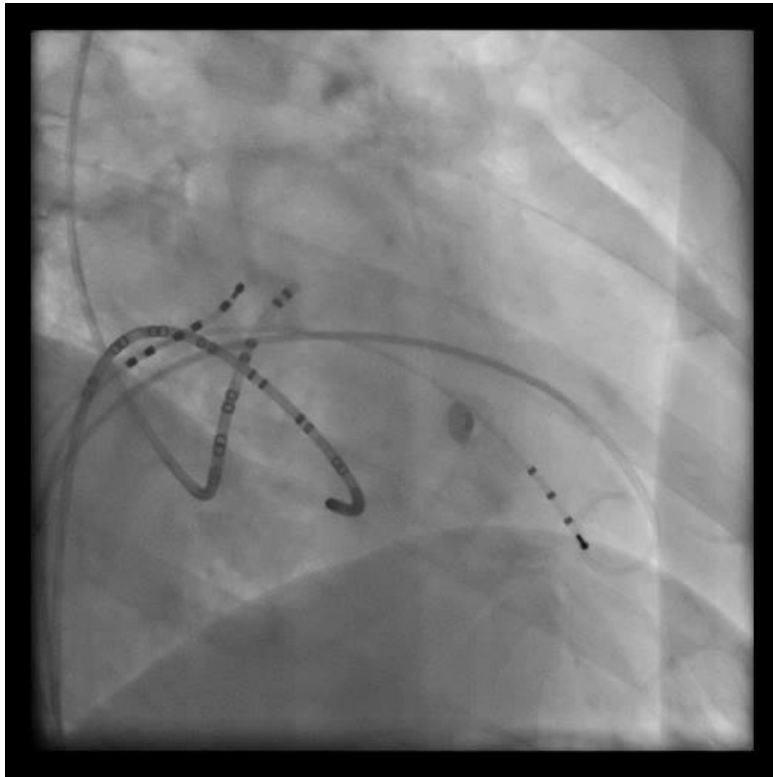
*W Wei et al. Europace 2014*

# Tricuspid annuli in Ebstein anomaly

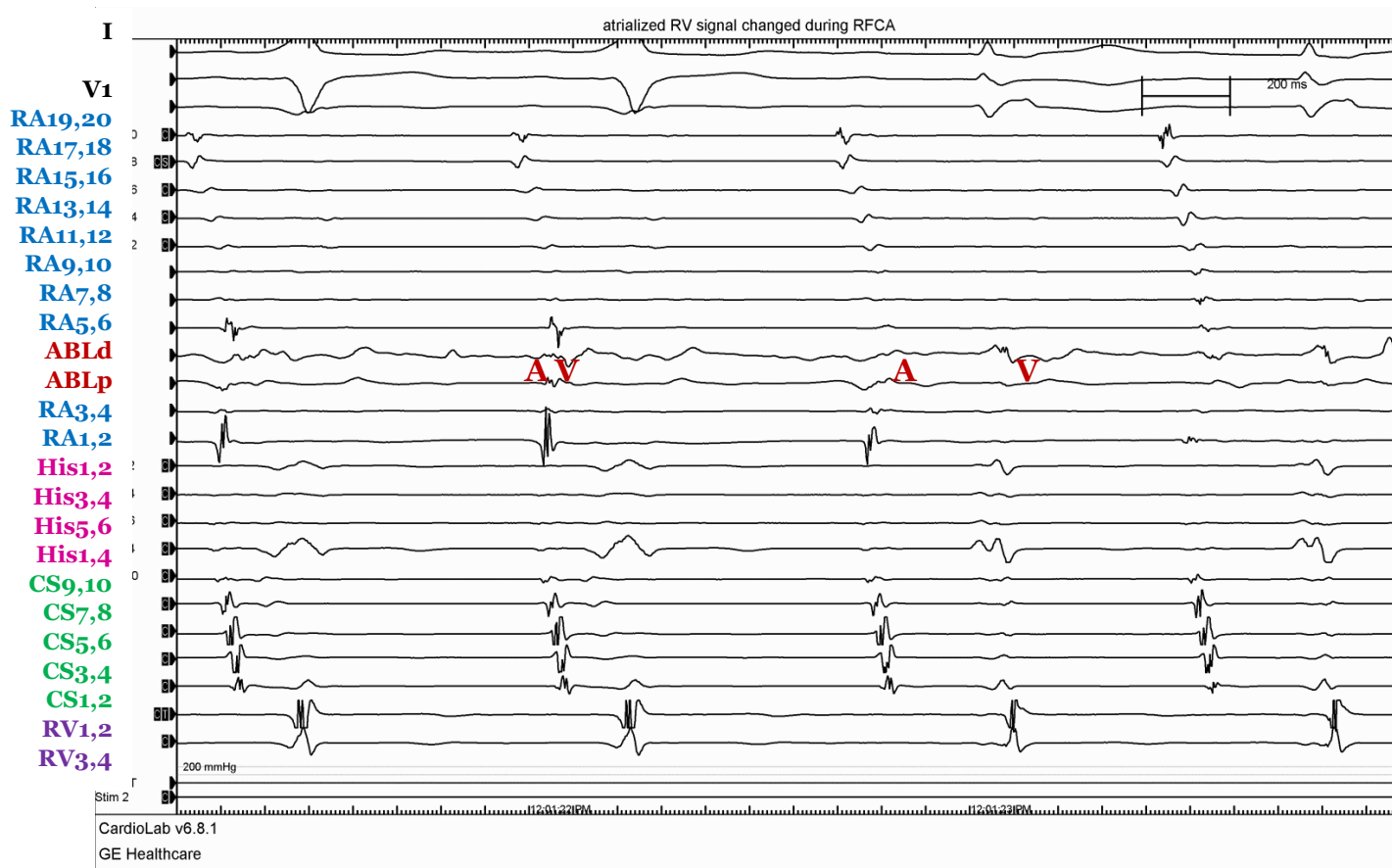


Usual ablation target area

# Right Ventriculography

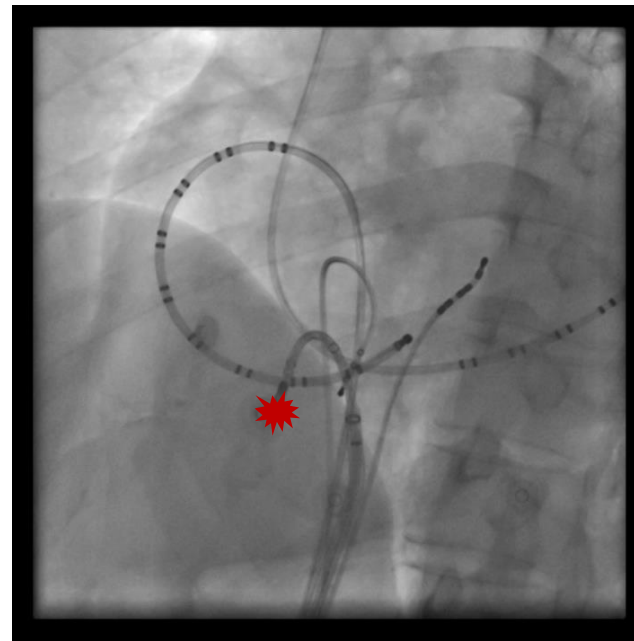
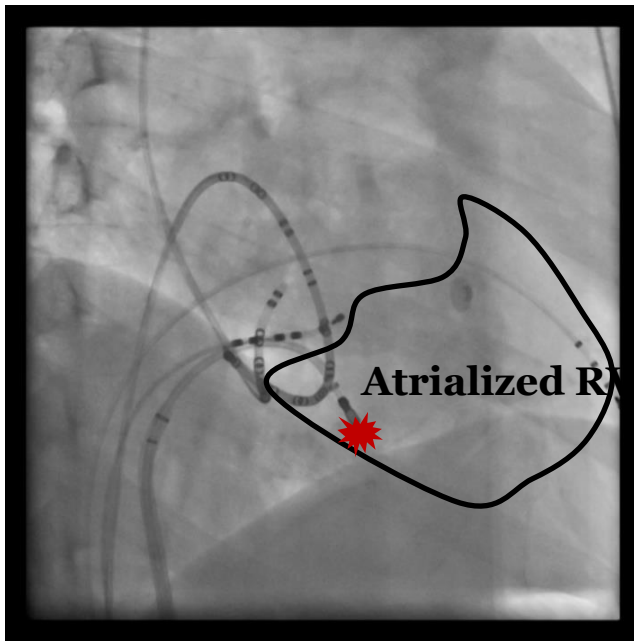


# Delta wave disappeared during RFCA

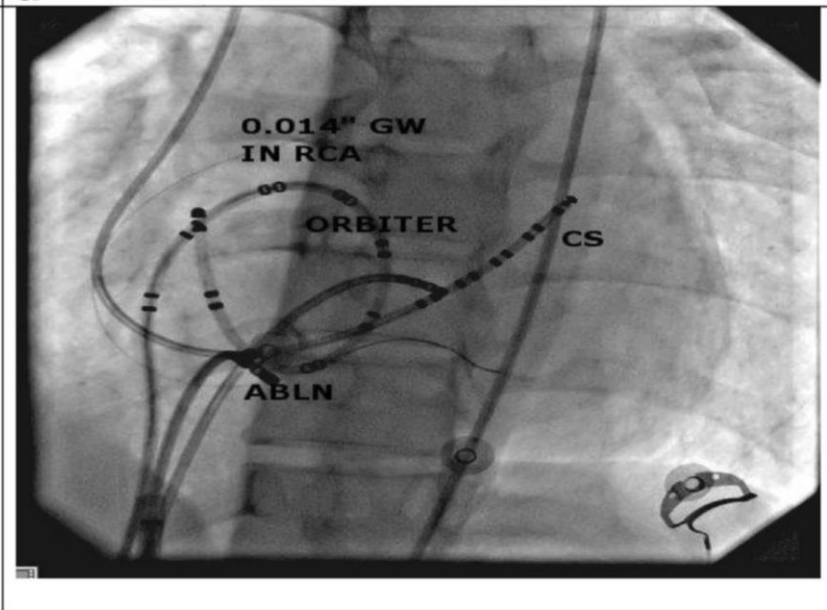
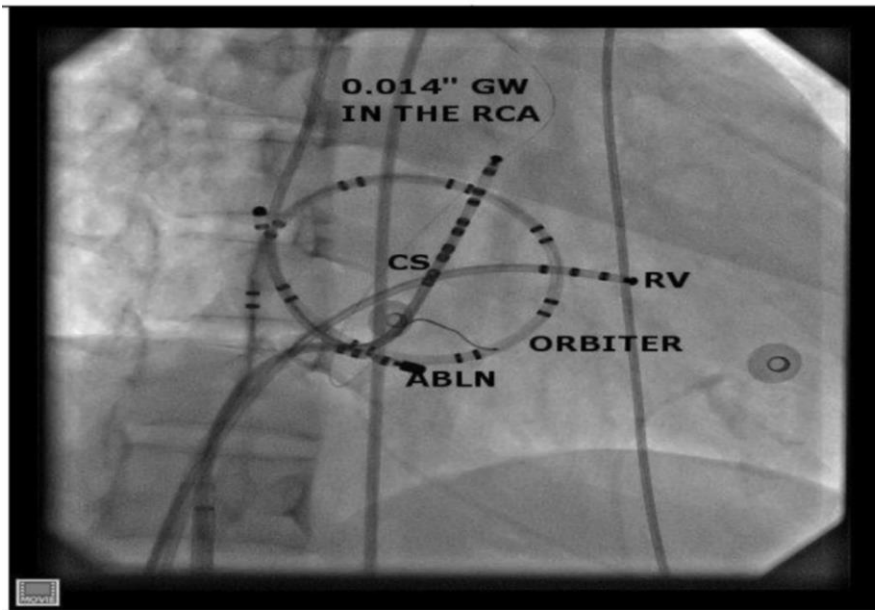




# RFCA for right posterior AP



# Intracoronary wire can be guidance



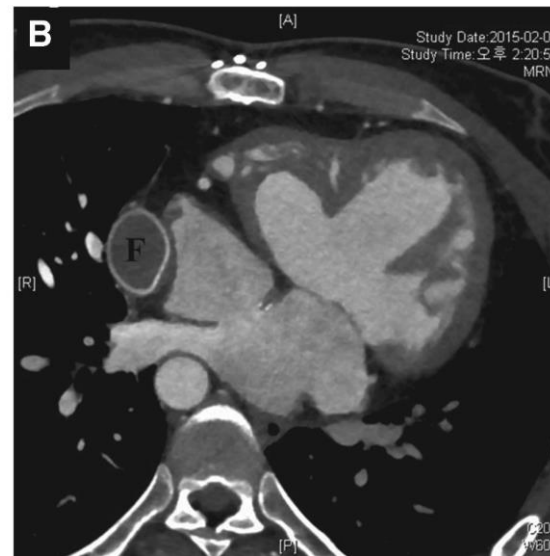
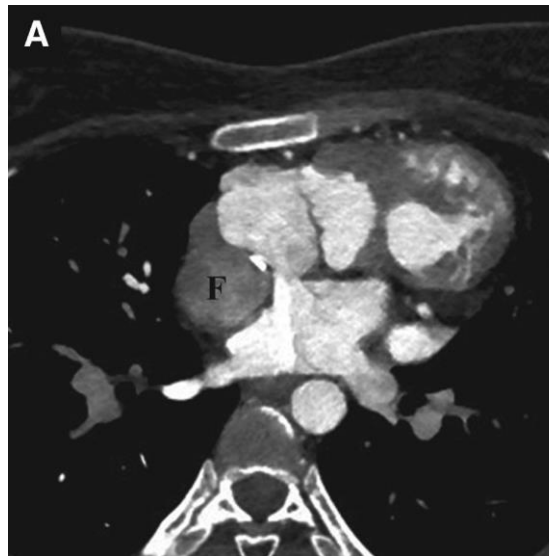
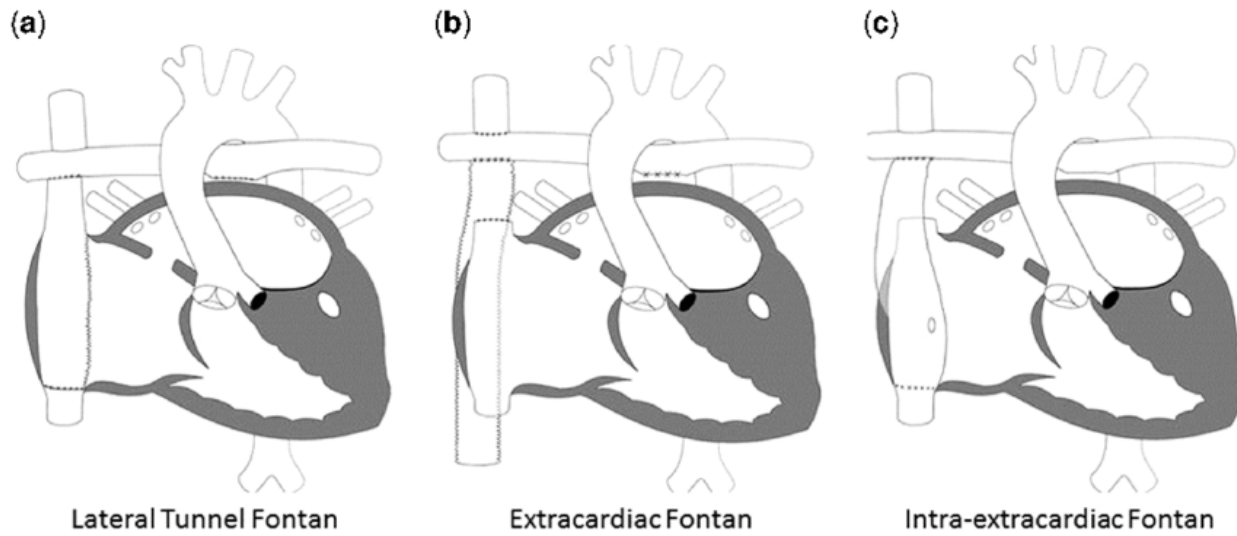
Shah et al. *JCE* 2004

# Challenging issues

- Atrialized RV
  - fragmented and low-amplitude EGM
  - Difficult to distinct between atrial and ventricular activation potentials as well as the identification of AP potentials.
  - Success rate: 60-70%

Cappato et al. *Circulation* 1996

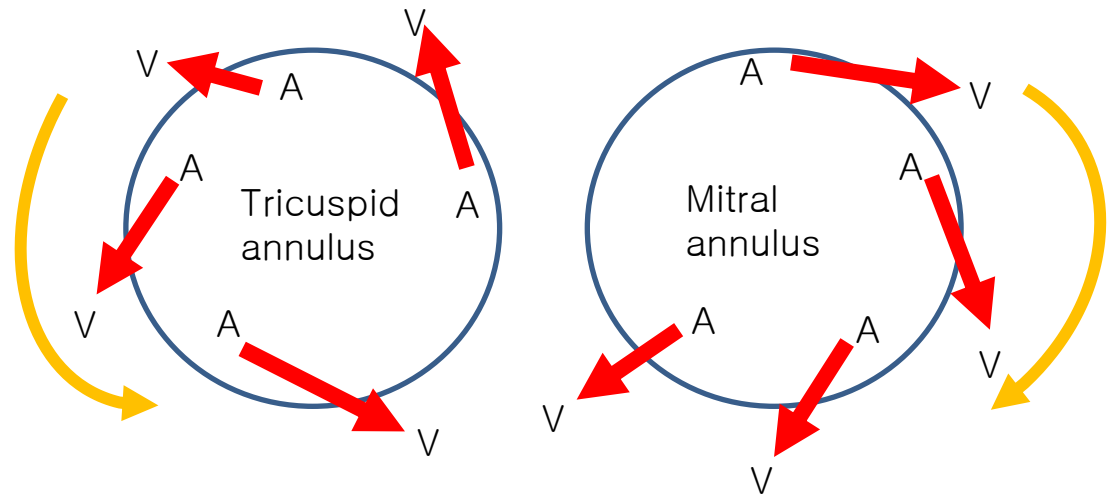
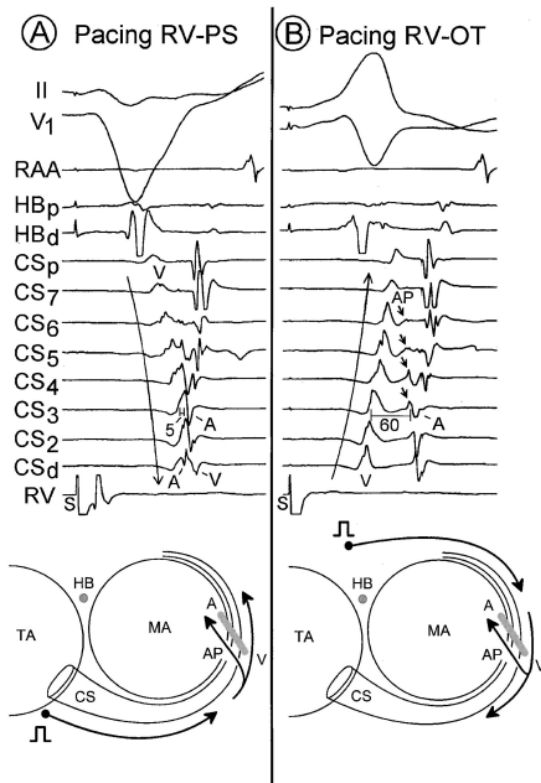
# After Fontan procedure



Uhm et al. *Europace* 2017

# Slant of accessory pathway

- 91% of single AP

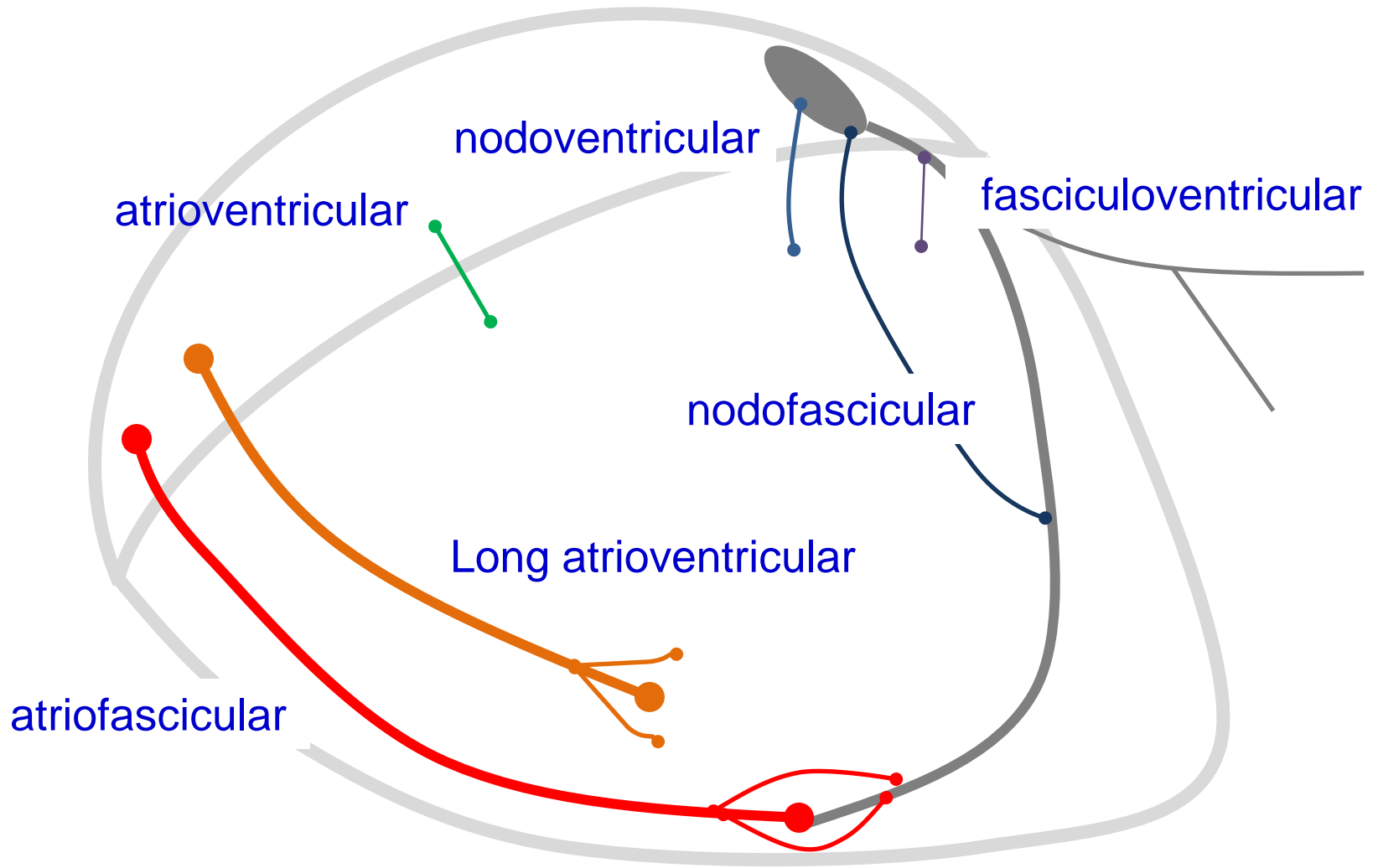


Otomo, Jackman et al. *Circulation* 2001

Mark E. Josephson. *Clinical cardiac electrophysiology*, 4<sup>th</sup> ed

# Atypical accessory pathway

# Variants of Preexcitation



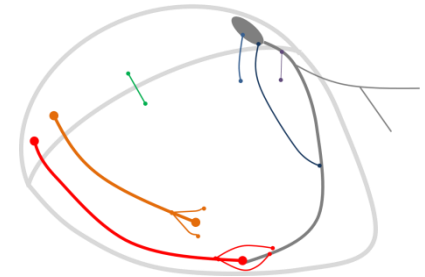


# Characteristics

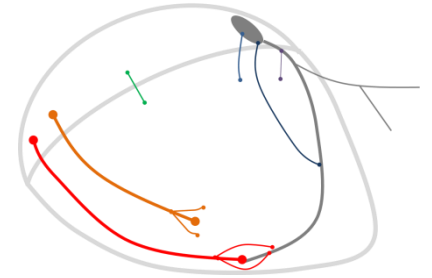
- 3~5% of all BTs
- Dual AV node or multiple BTs: 40% of patients with variant of preexcitation
- Unidirectional conduction (anterograde)
- Long conduction time
- Decremental conduction

# ECG features

- Subtle preexcitation
- Like LBBB
  - no septal forces (q in I ,aVL, V6), negative in III
- Relatively narrow (130~140ms)
  - -fascicular
- Late transition of precordial R wave



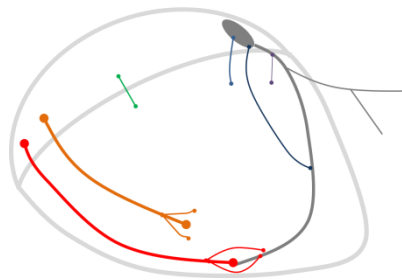
# EP study (1) - A pacing



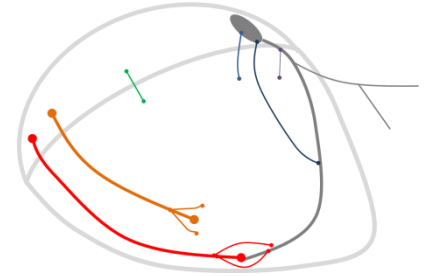
- During shorter A pacing
  - P-delta increase (+more preexcited QRS)
  - Fixed VH interval if ~fascicular BTs
  
- Fixed preexcitation as A pacing sites
  - ; nodo~ or fasciculoventricular BTs

## EP study (2) - V pacing

- Mostly useless...
- If fixed VA conduction, suspect another typical BT



# EP study (3) – antidromic tachycardia features



- VH

~fascicular (10~20ms) << long AV BT (40ms) < nodoventricular

- PAC during His refractory

- advance or delay: atriofascicular, long AV BT
- no change: nodo~, fasciculoventricular