Uncommon Type of Preexcitation Syndrome

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Preexcitation syndrome

1) Preexcitation by AV bypass tract
   - WPW (AVRT, with AF), AVNRT with innocent BT…

2) Lown-Ganong-Levine syndrome
   - Enhanced AV nodal conduction (short PR, normal QRS)

3) Variant of preexcitations
History of Preexcitation Syndrome (1)

- 1893  Kent’s bundle
- 1930  WPW syndrome
- 1933  Kent’s bundle and short PR

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Original Communications

THE MECHANISM OF PRODUCTION OF SHORT P-R INTERVALS AND PROLONGED QRS COMPLEXES IN PATIENTS WITH PRESUMABLY UNDAMAGED HEARTS: HYPOTHESIS OF AN ACCESSORY PATHWAY OF ATRIOVENTRICULAR CONDUCTION (BUNDLE OF KENT)*

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History of Preexcitation Syndrome (2)

- 1937  ‘Mahaim fiber’
- 1942  histological proof of connections btw A and V
- 1944  ‘Preexcitation syndrome’ termed by Ohnell

‘delta wave’ proposed by Segers

*Bypass tracts as the mechanism of preexcitation was not generally accepted until the 1970s.*
History of ‘Mahaim fiber’

• In 1937, Mahaim and Benatt
  – during pathological examination
  – another conducting tissue from the His (or AV node?) into ventricular myocardium

• Subsequent electrophysiological studies,
  – almost right side, long, and decremental property
  – atriofascicular, slow conducting long (or short) AV bypass tract, nodoventricular, nodofascicular, fasciculoventricular
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 and decremental conduction
어떤 경우에 의심해야 하는가? 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
  – more preexcited QRS, P-delta increase
  – Fixed VH interval if ~fascicular BTs

• Fixed preexcitation as A pacing sites
  ; nodo~ or fasciculoventricular BTs
P-delta increase during AES
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
PAC during His refractory
EP study (4) – miscellaneous

• Adenosine
  – more preexcited QRS except fasciculoventricular

• VA block during tachycardia
  – nodo~

• Persistent preexcitation during His pacing
  – fasciculoventricular
Summary

- Subtle preexcitation
- Relatively narrow QRS
- like LBBB
- Late transition

P-delta increase as shorter A pacing

- Change pre- as A pacing site
- CL Change by PAC

Atriofascicular or Long AV BT

Short VH (10~20ms) tachycardia

Atriofascicular

Long AV BT

Nodo~, Fasciculoventricular

Short VH (10~20ms) tachycardia

Nodofascicular

Nodoventricular