Cardiology update

Clinical Decision Seminar: Difficult ECG Interpretations

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1. Patient K.P., male, 68 years

- Fatigue
- Exercise intolerance for one year
- Echo: globally reduced LV Function:
  - EF 30%
1a. What is the diagnosis?

1. Atrial Tachycardia
2. Permanent junctional reciprocating tachycardia
3. Atrial flutter
4. AVNRT
5. AVRT
6. Can be anything of the above
1b. What is the diagnosis?

1. Atrial Tachycardia
2. Permanent junctional reciprocating tachycardia
3. Atrial flutter
4. AVNRT
5. AVRT
6. Can be anything of the above
Atrial Flutter

RA

FO

CSO

inferiorer Isthmus

TA

VCI
Typical Atrial Flutter Type I

RA

FO

CSO

TA

VCI

inferiorer Isthmus
Typical Atrial Flutter Type II

RA  FO  CSO  TA

VCI

inferiorer Isthmus
Atrial Flutter
Patient K.P., male, 68 years

- Check-up 3 months after ablation:
  - Symptoms resolved
  - Back to normal activity
  - Echo: LV Function recovered: EF 55%
2. Patient S.K., male, 52 years

- Palpitations
- SOB
- Palpitations during Skitour which did not terminate by itself
2. Diagnosis

1. Polymorphic VT
2. Monomorphic VT and Sinustach
3. SVT with and without aberrancy
4. VT and SVT
5. Sinus Tach with BBB
6. SVT with and without linking
7. Don’t know
Treatment

- EP study:
  - → AVNRT
  - → Slow pathway modification
3. Patient E.H, male, 24 years

- Unresponsive at night on street
- Smell of alcohol
3a. What does this patient need?

1. Calcium
2. Magnesium
3. Potassium
4. Slight cooling
5. Core warming
6. Glucose-Insuline
3b. What is the name of these waves?

1. Epsilon Wave
2. Delta Wave
3. Alpha wave
4. J wave
5. Osborne wave
6. 4 and 5
Typical ECG Features of Hypothermia

1. Sinus Bradycardia
2. P waves widened
3. QRS widened
4. Osborn waves (J waves):
   Concave elevation at end of QRS-Beginning of ST
5. Prolonged QT
Complications

Myocardial damage (reversible)
Hypotension
AF
VF
Pulmonary
Hematologic
Renal
Prominent J deflection attributed to hypothermia first reported in 1938 by Tomaszewski.
J waves described in 1953 by John J. Osborn 1917 and named after him (American Journal of Physiology on experimental hypothermia)
4. Patient P.G, male, 54 years

- Prolonged URI
- Chest pain
- Otherwise healthy
4a. Diagnosis

1. SA Block
2. AV Block I
3. AV Block II Type Wenckebach
4. AV Block II Type Mobitz
5. AV Block III
6. Don’t know (indeterminate block)
Indeterminate Block
4b. What do we do?

1. Implant a pace-maker
2. Implant an event recorder
3. Reassure and send home
4. Exercise test
5. EP Study
5. Patient R.P., female, 57 years

- No previous medical history
Presenting complaint

- acute onset of palpitations, dizziness, pre-syncope, nausea
- spontaneous recovery
- recurrence of the same symptoms during afternoon walk 3h later
5a. Diagnosis of this WCT?

1. SVT with Aberrenency?
2. Ventricular tachycardia?
3. WPW with antidromic AV Tachycardia?
SVT-VT Differential Diagnosis

- AV-Dissociation?
  - no
  - no “RS” in precordial leads?
    - no
    - R-S >100 ms in one precordial lead?
      - no
      - morphology criteria for V1 and V6 are met?
        - no
          - yes
            - VT
          - yes
            - VT
          - yes
            - VT

SVT with Aberration

Brugada, Circulation 1991;83(5):1649-59
SVT-VT Differential Diagnosis

- AV-Dissociation? yes
  - no

- no “RS” in precordial leads? yes
  - no

- R-S >100 ms in one precordial lead? yes
  - no

- morphology criteria for V1 and V6 are met? yes
  - no

SVT with Aberration

Brugada, Circulation 1991;83(5):1649-59
5b. Origin of this VT

1. LV base
2. LV apex
3. RV base
4. RV apex
5. Can’t tell
Major criteria ARVC

- Severe structural abnormalities of the RV
- Fibrofatty replacement of myocardial tissue
- Epsilon waves at right precordium (V1-V3)
- Familial disease (necropsy or surgery)
Minor criteria ARVC

- Mild structural abnormalities of the RV
- Inverted T waves at right precordium (V2, V3)
- Late potentials (SAECG)
- LBBB type VT or frequent VES (>1000/d)
- Family hx of SCD or ARVD

Task Force Criteria, Mc Kenna, 2010
ARVC Program Zurich

• Founded in June 2011
• National and international collaboration:
  Research and clinical of according subspecialties
6. Patient H.F., male, 67 years

- «Not feeling well» for one month
- Fever
- UTI
- Now: nausea, insomnia
6. What is the diagnosis?

1. Ischemia
2. Myocardial Infarction
3. Hypertrophy
4. Hypertensive crisis
5. Hyperkalemia
6. Hypokalemia
Hyperkalemia

• 2% of Potassium extracellular
• Ratio: K(intra) : K(extra) determines Membrane potential
• Hyperkalemia: Ratio: K(intra) : K(extra) decreases → Hyperkalemia decreases Membrane potential
• Moderate Hyperkalemia:
  Depolarisation, increased exitability (Nernst-equation)
• Severe Hyperkalemia:
  Depolarisation → Sodium System stays inactivated
Hyperkalemia

• Cave:
  • Arrhythmias (sinusoidal, VT, Asystolie)
  • Pacing Threshold increases!
  • Negativ inotrope
  • Negativ dromotrope
• Principle of cardioplegic solution
Hyperkalemia

- 5.5-7.5 mmol/l:
  - Peaked T-Waves
  - QRS Widening
  - PQ-Prolongation, AV Block
- >7.0 mmol/l:
  - no P-Waves
  - Extremely wide QRS
  - VT ("sinusoidal")
  - Asystolie
K 6.8 mmol/l
K 7.5 mmol/l
K 8.5 mmol/l
K 4.8 mmol/l
68 y/o male Patient
CAD
St. p. CABG
barely responsive
Patient M.L., female, 38 years

- AV Block III congenital
- Very active lifestyle
- Exercise Intolerance