Sports cardiology: Pre-competition screening

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Content

• Interactive case presentation
• Background and theory
• Discussion
CLINICAL CASE
Background

- Regular **pre-competition screening** for referees considered for Brazil 2014

- **Basic** screening
  - Medical history/ questionnaire
  - Clinical exam
  - ECG

- **Extended** screening
  - Echo
  - Others if necessary/ pathologic findings
Our guest from the Seychelles

- Male, **37 years** of age
- **Asymptomatic** patient
- “Healthy”
- No drugs/ doping
- Negative family history
- Unremarkable clinical exam
The EGC – Comments?
The Echocardiography – Please comment...
Normal vs. abnormal RCA

Our «patient»
**Next steps?**

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<th>Possible options</th>
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| Wait and see?    | Patient has survived  
|                  | He is asymptomatic   |
| No more competitive sports? | According to Guidelines |
| Further exams for clarification? | Which exams to detect what? |
Don’t stop ‘til it’s over…
Further exams for thorough assessment

- **Disease extension/ associated structural disease?**
  - CT scan
  - MRI
  - Coronary angiogram

- **Relevance of the disease: Ischemia?**
  - Stress-Echo
  - MRI
  - Szintigraphy
  - PET-scan
Coronary CT-scan
Further exams are necessary for assessment

- **Disease extension/Associated structural disease?**
  - CT scan
  - MRI
  - Coronary angiogram

- **Relevance of the disease: Ischemia?**
  - Stress-Echo
  - MRI
  - Szintigraphy
  - PET-scan
Relevance? → No ischemia
BACKGROUND AND THEORY
Congenital coronary artery abnormalities: Basis (1/2)

- Development of coronary arteries approx. on **day 32 of gestation**

- **Incidence:** approx. **0.64%** of births

- **Most common:** insignificant forms/regular variants
  - Separate origins of the RCA and conal branch: 50%
  - Separate ostium of LAD/ CX: 1%

- **Left-sided**

- **Right-sided:** origin from the pulmonary artery
  - *Coronary insufficiency* (low perfusion pressure, low oxygenation)
  - Left-right *shunt with steel* syndrome

- **Complex anomalies** (Fallot, Transposition, Truncus arteriosus)

Congenital coronary artery abnormalities: Basis (2/2)

• Left-side forms:
  • Main stem/ **LAD from right Sinus** of valsalvae or RCA-ostium
  • **RCA from left Sinus** of valsalvae/ ostium of main stem

• **Different risk categories**, depending on the course of the artery
  • **Critical**: course between the Aortic root and pulmonary artery
  • **Critical**: Angle of take off
  • **Critical**: Intramural course

Risk-stratification for coronary anomalies

Low-Risk

High-Risk

Intramural course
**Reasoning**

**Compression of coronary arteries**

- Dilatation of Aorta/ pulmonary trunk with increased blood pressure
- Direct compression by muscular contractions (for intramural course)

**Increased O₂ need** during physical exercise

- Ischemia
- Arrhythmia
- SCD

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Screening

- **Objective:**
  - Detection of potential harmful anomalies

- **Methods:**
  - ECG: no specific findings (unless past infarction)
  - Echocardiography
  - Coronary CT
  - Cardiac MRI
  - (Coronary angiogram)

Treatment methods

- **All** arteries arising **from the pulmonary artery**:
  - Surgical correction

- Depending on symptoms:
  - **Probably no therapy necessary in asymptomatic patients** without ischemia
    - No controlled outcome studies
    - Potentially beneficial for left main from right ostium

  - **Surgical** intervention **for symptomatic** patients
    - Documented ischemia
    - SCD, arrhythmia
Summary: Congenital coronary malformation

• Rare, with wide spectrum
  • Asymptomatic
  • Symptoms of ischemia (angina)
  • Sudden cardiac death

• Prognosis depends on
  • Form of malformation
  • Physical activity
  • Concomitant disease (e.g. atherosclerosis)

• Treatment
  • For athletes (no competitive sports)
  • In patients with symptoms -> surgery
  • In patients with involvement of pulmonary artery -> surgery
If it was not for the disease...
DISCUSSION