SPR 2017
CT Angiography for Pediatric Coronary Anomalies
Disclosures

• No financial disclosures
Coronary Artery Anomalies

- Anomalies of origin and course
- Confusing terms
  - Myocardial bridges and septal courses
  - Fistulas and sinusoids
- Kawasaki Disease
- Future directions
Anomalies of Course: AAOLCA

Interarterial and intramural LCA (AAOLCA)

- Between MPA and aorta
- Runs in the wall of the aorta
Features suggesting Intramural location

<table>
<thead>
<tr>
<th>Narrowed and acutely angled</th>
<th>Absent epicardal fat</th>
<th>Slit like orifice</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
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Narrowed and acutely angled, Absent epicardal fat, Slit like orifice.
Anomalies of Course: AAORCA

- Interarterial and intramural
- ?? Associated with life threatening arrhythmias and sudden death
Coronary Confusion

- Intramural features on CT/MRI are all secondary
  - “we don’t really know for sure its intramural”

- AAORCA is much more common than AAOLCA
  - Much less sudden death
AAORCA/AAOLCA: Unroofing Repair

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<th>PreRepair AAOLCA</th>
<th>Surgical Unroofing</th>
<th>Unroofed LCA</th>
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- PreRepair AAOLCA: Shows an anatomical structure before any surgical intervention.
- Surgical Unroofing: Depicts the process of unroofing a structure.
- Unroofed LCA: Illustrates the final result after unroofing.
Unsuitable for Unroofing

- Origin of AAOLCA/AAORCA is too close to commissure
- Intramural segment length is too short
- Not intramural
? Intramural or Extramural
Trending

Flow Fractional Reserve CT (FFR CT)

*Diagnosis of functional ischemia in a right coronary artery with anomalous aortic origin Kawaji et al. Journ of cardiovasc CT 10 (2016) 188-190
Benign Courses

**Retroaortic LMCA:**
LMCA arising from R sinus and courses posterior to aortic root

**Preinfundibular LMCA:**
LMCA arising from RCA and coursing anterior to RVOT
Confusing terms: Septal course vs Myocardial Bridge

**Septal LMCA:**
LMCA arising from R sinus below PV and coursing in interventricular septum

**Myocardial Bridge:**
LAD briefly dives into interventricular septum
ALCAPA

LMCA filling retrogradely from RCA collaterals and arising from MPA

LMCA arising from MPA
LMCA Atresia

LMCA fills retrogradely from extensive RCA collaterals
Confusing Nomenclature: Fistulas versus Sinusoids

Coronary Sinusoids between RCA and RV in patient with PA-IVS

Giant Coronary Fistula between RCA and coronary sinus
Confusing Nomenclature: Fistulas versus Sinusoids

• Fistulas:
  – Giant fistulas usually coronary to venous
    • Typically coronary to SVC/Right atrium
  – Small fistulas
    • Coronary to coronary
    • Coronary to pulmonary artery
Kawasaki Disease

- Systemic vasculitis
- < 5 years, Asian and boys
- Coronary dilation in the first 7 days, peak at 4 weeks
- NSAIDs, steroids, immune modulating agents and gamma-globulins
- Best outcomes if treated within first 10 days
Kawasaki Risk Level

I. Normal
II. Transient ectasia
III. Solitary small aneurysms
IV. Giant aneurysms
V. Stenosis
Kawasaki Giant Aneurysms

- z-score of ≥10
- Japanese criteria ≥8 mm
  - 25% risk of stricture/MI
  - 40% completely regress in first 5 years
  - ? Normal wall

*Regression and Complications of z-score-Based Giant Aneurysms in a Dutch Cohort of Kawasaki Disease Patients*  
Trending

Cardiac CT for OHT Vasculopathy
Summary

• **Coronary Anomalies**
  – AAOLCA and AAORCA
  – Benign Courses
  – Atresia
  – ALCAPA

• **Terminology**
  – Septal Course and myocardial bridge
  – Sinusoid and Fistula

• **Trends in Coronary CT**
  – FFRCT in anomalous coronaries
  – Coronary Vasculopathy