How to Evaluate LVOT and Aortic Arch Obstruction

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Disclosure

• GE Healthcare

• Morpheus Imaging

• Off-label gadolinium use
Outline

• MR evaluation

• Example in some disease entities
Core protocol elements

1. Cardiac anatomy
2. Cardiac function
3. Flow
4. Vascular anatomy
1 & 2: Anatomy and Function

Optional: candy cane bright blood cine or DIR
Normal LV mass

- Males: $53 \times \text{BSA}^{1.304}$
- Females: $45.2 \times \text{BSA}^{1.304}$
Normal right- and left ventricular volumes and myocardial mass in children measured by steady state free precession cardiovascular magnetic resonance

Emanuela Valsangiacomo Buechel*1, Thomas Kaiser1, Clare Jackson1, Achim Schmitz2 and Christian J Kellenberger3
3: Flow

- Aortic valve
- Pulmonary valve

optional
Flow encoding options

- Through plane
- In-plane
- Vector
4: MRA

- Coronal or sagittal
- Don’t forget arch vessels
3: Flow at arch

MRA

In plane PC
Gradient estimation

- $4v^2$
- Many pitfalls
  - High entry velocity
  - Turbulence (factor higher than 4)
  - Off-axis, missing the peak
  - Low cardiac output
  - Collateral flow
Levels of Obstruction

• Subaortic
  – Discrete fibrous membrane
  – Muscular
    • Both
  – Accessory mitral valve tissue/chords
  – Fibrous tissue from VSD patch closure

• Valvular
  – Bicuspid valve

• Supravalvular (rare)

• Arch
  – Hypoplastic arch
  – Interrupted arch
  – Coarctation
Example: Subaortic
Example: Valvular - Bicuspid
Example: Arch Hypoplasia

Mild LVH
Example: Coarct
Thank You