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Phase-velocity cine

1) How is pulmonary arterial blood flow affected by pulmonary venous obstruction in children? A phase-contrast magnetic resonance study. *Pediatr Radiol. 2005*
age: median 39mos weight: median 12kg

TE 4.6-5.1msec TR 10.4-12.9msec Flip angle 20° matrix 256×160
FOV 150-320×112-240mm Slice thickness 4-6mm
Views per segment 4-8 Number of excitations 2
Number of reconstructed phases in a cardiac cycle 20

2) Phase-contrast MR assessment of pulmonary venous blood flow in children with surgically repaired pulmonary veins. *Pediatr Radiol. 2003*
age: median 30mo weight: median 13kg

TE minimum TR minimum Flip angle 20° matrix 256×128
FOV 150-320×112-240mm Slice thickness 4mm
Views per segment 1 Number of excitations 2
Number of reconstructed phases in a cardiac cycle 20
Retrospective ECG gating

3) Differential regurgitation in branch pulmonary arteries after repair of tetralogy of Fallot: a phase-contrast cine magnetic resonance study. *Circulation. 2003*
age: median 147mos

TE 4.5-5.6msec TR 10.0-14.6msec
temporal resolution 80-226msec(mean 128msec) at HR of 52-119bpm
Flip angle 15-20°
matrix 256×128-160
FOV 180-400mm Slice thickness 4mm
Views per segment 4-8
Number of excitations 1 (for breath-hold only) 2 (for non-breath-hold only)
Number of reconstructed phases in a cardiac cycle 20
Retrospective ECG gating

4) Comparative imaging of differential pulmonary blood flow in patients with congenital heart disease: magnetic resonance imaging versus lung perfusion scintigraphy.

Pediatr Radiol. 2005

PVC-MRI sequence

TE 4.6-5.7msec TR 10.4-13msec

temporal resolution 80-226msec(mean128msec) at HR of 52-119bpm

Flip angle 20°

matrix =256×160

FOV 150-320×112-240mm Slice thickness 6mm

Views per segment 4-8

Number of excitations 1 (for breath-hold only) 2 (for non-breath-hold only)

Number of reconstructed phases in a cardiac cycle 20

Retrospective ECG gating

Tal Geva, MD
Boston Children's Hospital

Localizers (breath-hold or non-breath-hold)

Basic sequence : Fast gradient-recalled echo

No ECG gating

TE minimum TR minimum Flip angle 30° Band width 31.2kHz
matrix 256×128

FOV as needed Slice thickness 5-10mm Skip none

Signal acquired 1 Asymmetric FOV 0.75-1.0

FIESTA (non-breath-hold)

Basic sequence : Fast gradient-recalled echo

Prospective ECG gating

Trigger window : minimum

Trigger delay : auto preset

TE minimum TR minimum Flip angle 30° Band width 32kHz
matrix 256×128

FOV as needed Slice thickness 4-10mm Skip as needed minimum is 0mm

Signal acquired 4 Asymmetric FOV 0.75-1.0

FIESTA (breath-hold)

Basic sequence : Fast gradient-recalled echo

Prospective ECG gating

Trigger window : minimum

Trigger delay : auto preset

TE minimum TR minimum Flip angle 15° Band width 20.8kHz
matrix 256×128

FOV as needed Slice thickness 4-10mm Skip as needed minimum is 0mm

Signal acquired 1 Asymmetric FOV 0.75-1.0

1) Magnetic resonance Imaging Predictors of Coarctation severity

Circulation 2005

PVC-MRI sequence

TE=3-4ms TR=8-10ms matrix=128×160-256 view per segment=2-4

FOV=140-320mm slice thickness=4-6mm

sampling interval=32.3±8.7ms

number of samples per RR interval=23.8±5.8ms

3-D MRA sequence

TE=1-3ms TR=2-6ms matrix=256×160-192 slice thickness=1.8-3.6mm

FOV=180-440mm flip angle=45° number of signal average=0.5-1

Magnevist 0.2-0.3 mmol/kg injected 2mL/sec time delay=5-10sec

Two sequential acquisition breath-hold Each lasting 20-30sec

順番

- ① Localizers
- ② FIESTA ; RV volume measurement
 - 1) 4 chamber view
 - 2) Axial view
 - 3) RVOT view
- ③ PVC MR imaging ; PR の評価
MPA, RPA, LPA, AAO で mapping
- ④ 3D-MRA: PA anatomy
できれば whole-heart も