Imaging algorithm for infants & children with potential reno-vascular hypertension

Validate indication

Renal US + CDS & DDS

Diagnosis evident

Renal artery stenosis

DDS criteria:
PSV >180-200 cm/sec
note: age variations
RAR >3.5, S-RI >0.05
Acceleration time >80msec,
Tardus-Parvus pattern distally

other causes

inconclusive US or no signs of RVD

Stage 1 hypertension
or BP well controlled on 1-2 drugs

Stage 2 hypertension,
BP not controlled by 2 or more drugs,
stage 1 age <3y or high clinical suspicion**

high clinical suspicion**

CTA
or Captopril renography / MRA ***

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reno-vascular disease

clinical follow-up

normal

DSA with simultaneous PTA
(potentially + renal vein sampling)

Further imaging as appropriate*

DSA + renal vein sampling
potentially simultaneous PTA

* Further imaging as appropriately indicated (see existing recommendations ...)

** High clinical suspicion: history of renal trauma or radiation, umbilical artery catheterization, renal vascular thrombosis, bruit over renal arteries, high renin levels, presence of disease associated with renovascular pathology (e.g., neurofibromatosis, Williams's syndrome, tuberous sclerosis)

*** MRA: potentially & increasingly, ce-MRU for large vessels & infarcted areas, non-enhanced MRA techniques for smaller vessels - if available?

**** Captopril scintigraphy: potentially prior to PTA for function, particularly in doubtful situations or neonates until old enough for PTA, local variations

Abbreviations: BC = blood count, BP = blood pressure, BUN = blood urea nitrogen, CDS = colour Doppler sonography, cm/sec = centimetres per second, CTA = CT-angiography, DSA = digital subtraction angiography, DDS = spectral duplex Doppler, MRA = MR angiography, PSV = peak, systolic velocity, PTA = percutaneous transluminal angioplasty, RAR = renal aortic ratio, S-RI = Resistive Index difference, RVD = renovascular disease, US = ultrasound, y = year

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