

# Radiology

## Dialysis patients/osteodystrophy

There is no need for any routine screening. Where hyperparathyroidism is being quantitated, a hand XR alone will usually suffice (request 'hand XR for hyperparathyroidism' in Edinburgh). Views of the pelvis may be justified in some circumstances - explain these on the request form if so.

## Renal Arteriography and Angioplasty

MR Angiography has greatly reduced use of conventional angiography. However concerns about Gadolinium-containing MR contrast media and Nephrogenic Systemic Fibrosis (Nephrogenic Sclerosing Dermopathy) mean that MRA be used very cautiously if at all in dialysis patients and patients with severe renal failure.

For conventional angiography, patients admitted on day of procedure, earlier if less fit. Overnight stay not routinely required for diagnostic angiograms, usually suitable for day case unit. Should stay overnight for interventions.

## Pre-Procedure

- Warfarin - stop 3 days in advance and check clotting on morning of procedure
- Non-steroidals other than aspirin : stop on day of procedure and for 48h
- Metformin - omit on day of procedure and withhold for 48 hours, restart if function OK
- All other medications including anti-hypertensive and anti-anginal to continue
- Fluids only for 2 hours prior to procedure (can have light breakfast if late am procedure)

## Investigations: recent results to be available for

- FBC (Hb must be  $>80\text{g/l}$ , Pts  $>100$ )
- U&E (K should be  $<5$ , if not give IV 10% dextrose 20mls/hr and 5mg Salbutamol neb)
- Coagulation screen - only if on anticoagulant or abnormality likely
- ECG if history of IHD, glucose if diabetic

## Observations

- Record BP – postpone only if very high
- Assess and document peripheral pulses

## Fluid management

Ensure patient well hydrated and good urine output prior to contrast (if pre-dialysis) – if in doubt put up 6hrly 500mls N Saline. Do not fluid overload dialysis patients. Avoid diuretics. Beware that after stenting/angioplasty, some patients may become polyuric.

## Consent

Should be done in OPD for diagnostic studies. Radiologist should obtain consent for interventional studies, need to warn of risks of contrast, and catheter-related complications including embolism, arterial occlusion, bleeding from puncture site, loss of renal function, occasional need for surgery after intervention.

## Post-procedure

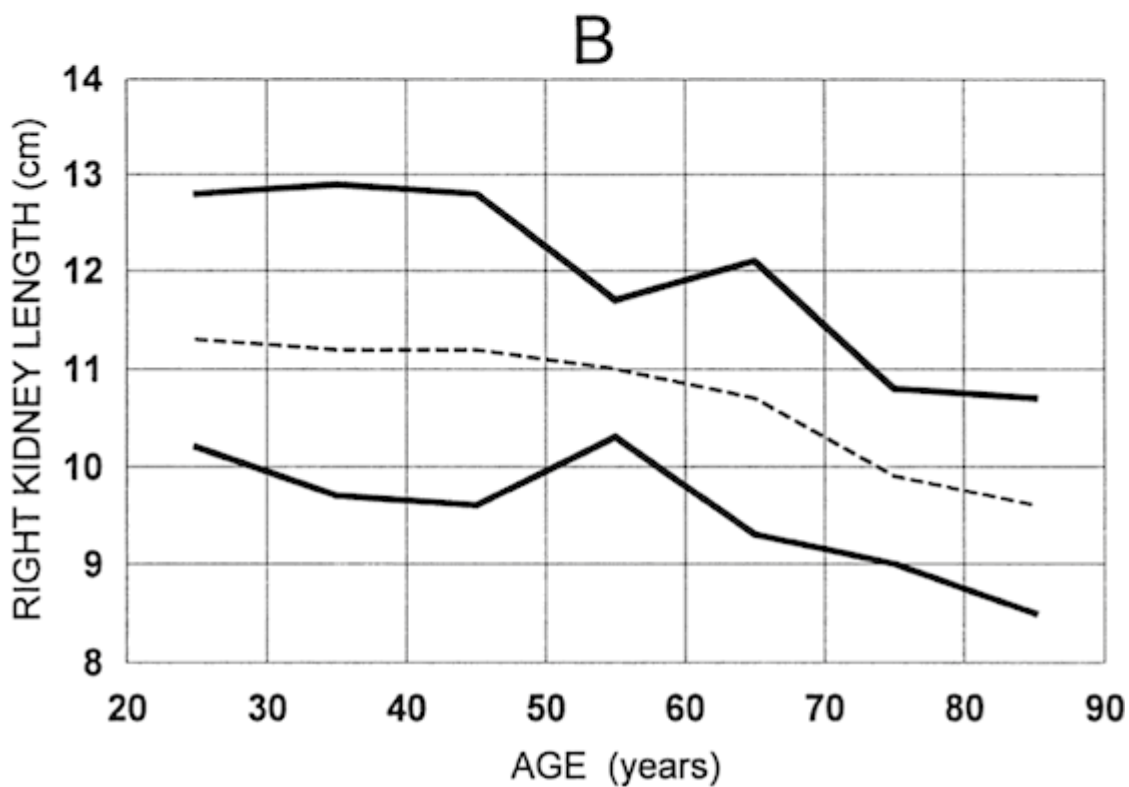
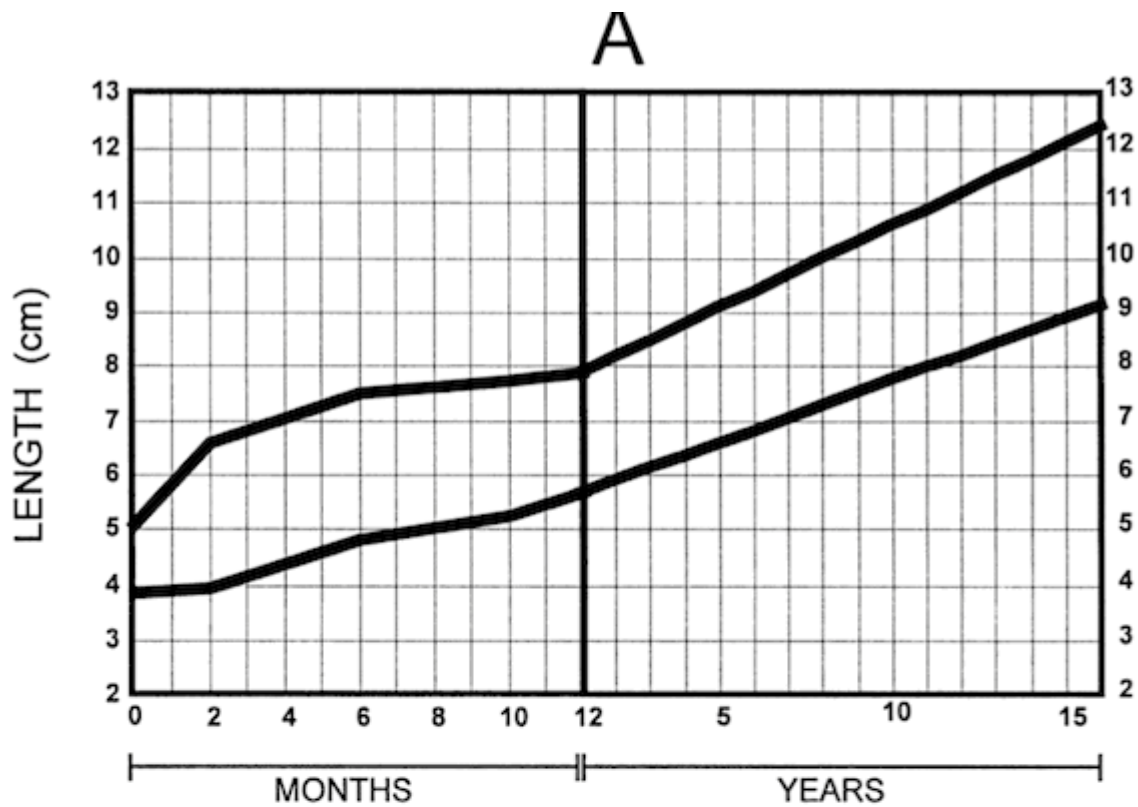
- Diagnostic studies – mobilise at 4 hours if no complications
- Interventions – mobilise at 6 hours, and overnight stay
- Pulse and BP – hourly for 4 hours, then 6 hourly overnight if IP
- Urine output – beware polyuria post-angioplasty
- Assess pain, wound, haematuria
- Check U&E following morning if kept in
- Warfarin can be restarted the following day
- Consider Aspirin 150mg if angioplasty/stent – ask radiologist if not clear

## Myeloma skeletal survey

(In Edinburgh, request in these words) – includes CXR, lateral skull, lumbar spine, pelvis, upper femur; plus 2 views of any symptomatic region.

## Ultrasound

The most requested and most frequently useful investigation, but observer dependent – speak to the operator if any question. Renal length averages 11 cm in adults, but there is some variability in measurement, and differences of up to 1cm in repeated measurements are common. Figures showing 95th centiles are from O'Neill, Am.J.Kid.Dis. 35:1021-38 (2000).



## Preventing contrast nephropathy

This is rare in the absence of its chief risk factors:

- Under-hydration/hypovolaemia
- Renal impairment
- Myeloma and possibly diabetes

The use of lower doses and less hyper-osmolar contrast media reduces risk.

Testing of several putative protective treatments has shown them to be harmful – this includes mannitol, diuretics, and dopamine. The use of N-Acetyl Cysteine (NAC) prophylactically probably does no serious harm, but the evidence that it prevents severe acute renal failure is weak.

If a patient is at increased risk, does this alter the balance of risk for doing/not doing the rest? If not:

- Warn the patient
- Administer fluid and withhold diuretics
- Consider NAC (but it cannot be regarded as essential)

### **Principles for prevention of contrast-associated nephropathy**

- **Keep contrast dose low**
- **Administer fluids and omit diuretics** – see below for amounts used in trials
- **N-Acetyl Cysteine (NAC)** is of uncertain additional value

### **Some regimens for preventing contrast-associated nephropathy**

#### **IV saline/bicarbonate**

- 0.9% saline @ 1ml/kg/h from 2-12h pre procedure, continuing to 24h
- One trial found NaHCO<sub>3</sub> to be superior to saline; systematic review has supported this for minor degrees of impairment, without impact on rate of dialysis or death:
- 1.26% NaHCO<sub>3</sub> @3ml/kg/h for 1h pre-, then 1ml/kg/h for a further 6h

#### **Oral NAC protocol** (in addition to fluid regimen)

- Can be given orally but it is very bitter
- Give 600mg twice daily for 48h starting the night before the procedure. 3mls of 200mg/ml intravenous NAC solution may be diluted up to 12ml with orange juice or cola
- May cause nausea or vomiting and rarely hypersensitivity reactions

#### **Immediate Saline/ IV NAC regimen**

- NAC 150mg/kg in 500ml N saline over 30 mins pre-procedure, then

- 50mg/kg in 500ml N saline over 4h post-procedure
- This is a much higher dose than the oral regimen and may cause side effects

**Acknowledgements:** Angela Webster was the original main author for this page. The last modified date is shown in the footer.