IMAGING MODALITIES OF THE KIDNEY

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Anatomical review
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Pyelon
Examination modalities:

- plain x-ray (film, fluoroscopy, tomography)
- contrast enhanced examinations
- catheter angiography (DSA)
- ultrasound (B-mode, Doppler-mode, color, duplex)
- computed tomography (CT, CTA)
- nuclear magnetic resonance imaging (MRI, MRA)
- x-ray-, US-, CT-, MR-guided interventions
- nuclear medicine
Plain film:
Contrast enhanced study:
DSA:
Ultrasonography:
Computed tomography:
Nuclear medicine:
Diseases of the kidney

• Developmental variations, disorders
• Collecting system (Obstruction, stone, hydronephrosis)
• Acute and chronic inflammation
• Circulation disorders (renovascular hypertension, function failure)
• (Diseases of the parenchyma)
• Injuries
• Space occupying lesions (cystic, solid)
Normal variations and congenital disorders (abnormality)

- fusion anomalies (Bertini-columna, lobulated kidney, dromedary-kidney, horseshoe-kidney)
- extrarenal pyelon
- congenital malposition (dystopy, crossed dystopy, malrotation)
- agenesis, hypoplasia

Other genital disorders!
Dystopy
Obstruction, stone, hydronephrosis

- acute: enlarged kidney, slow perfusion and excretion, moderate dilatation of the pyelon, stone, other causes
- chronic: dilated collecting system, thin parenchyma, pure excretion, stone, other causes
Ureter stone, acute hydronephrosis
Chronic hydronephrosis
Acut and chronic inflammations

- autoimmun: large/small kidney
- acute pyelonephritis (acute focal bacterial nephritis, etc)
- emphysematous pyelonephritis: large kidney, hypodensity, decreased contrast uptake, space occupation, thickening of the renal fascia, gas in the parenchyma
- Pyonephros: hydronephrosis, thick wall of the pyelon
- abscess: APN + abscess cavity
- segmental, polar, global atrophy
Calcified lesion
Surgical preparation
Chronic inflammation
Circulation and function abnormality

- infarction (partial, complete): no enhancement, absence of excretion
- Renal vein thrombosis: large kidney, slow perfusion, venous filling defect, perirenal collaterals, no excretion
- Renal artery stenosis, renovascular hypertension
- aneurysma
- Kidney failure: parenchyma destruction, calcification, pure excretion (contrast material?!?)
Kidney infarction
Renal vein thrombus
Renal artery stenosis on both sides
Posttraumatic A-V shunt
Kidney injuries

- blount or penetrating injuries, contusion
- haematoma (subcapsular/perirenal), urinoma, parenchyma laceration, artery/vein injuries, ureter rupture
Subcapsular haematoma
„Spontaneous” rupture
Space occupying lesion

cystic
  - simple (solitaer, multiple)
  - hereditary (polycystic disease)
  - atypical (closed calix, diverticula, cystic tumor, abscess, echinococcus, multilocular cystic nephroma)

• solide
  - benign (AML, adenoma, oncocytoma, etc.)
  - pr. malignances (RCC, TCC, Wilms-tumor)
  - sec. malignances (HL, NHL, metastasis)
Cyst
Cystic tumor in a horseshoe kidney
Angiomyolipoma
Hypernephroid carcinoma
(Grawitz-tumor)