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Renal Cell and Renal Pelvis/ Ureter Carcinoma

1. GROSS DESCRIPTION

Specimen

— fine needle aspirate/needle core biopsy/partial nephrectomy/nephrectomy ± ureterectomy/radical nephrectomy (kidney, pelvis, perirenal fat out to Gerota's fascia, adrenal gland, and a length of ureter)/segmental ureterectomy.
— right/left.
— weight (g) and size (cm).
— length (cm) of attached ureter.
— adrenal gland: present/absent.
— up to one-third of renal cancers are asymptomatic and an incidental finding on radiological examination. The classic triad of flank pain, mass and haematuria is infrequent and usually indicates advanced disease. Weight loss and painless haematuria are perhaps the most frequent presenting complaints. Investigation for renal cell carcinoma is by abdominal ultrasound and CT scan, which can distinguish cystic and solid lesions and provide staging information on nodal, renal vein and inferior vena cava (IVC) involvement. Renal pelvic cancers are defined by retrograde pyelography and ureteropyeloscopy with cytological brushings and/or forceps biopsy. Needle biopsy is only done in a minority of renal cell cancers with extensive spread for the purposes of obtaining a tissue diagnosis as a prequel to palliative adjuvant or immunotherapy, and also to rule out a more treatable cause of the renal mass, e.g. malignant lymphoma. Most imaging-proven and kidney confined mass lesions require surgical resection and omitting an invasive needle biopsy avoids disrupting local anatomical structures and any risk of upstaging tumour. The mainstay of surgical treatment for renal cell carcinoma is radical nephrectomy but advances in preoperative imaging and staging have made partial nephrectomy an option for select patients, e.g. tumour <4 cm, tumour in a solitary kidney, or with a poorly functional contralateral kidney. Renal pelvis/ureter carcinoma requires nephrectomy with ureterectomy although endoscopic resection for early low grade lesions is also now being used.

Tumour

Site
— upper/lower pole, midzone, hilum, medullary, cortical, subcapsular, extracapsular, pelvic/peripelvic.
— single/multiple (satellite nodules in 5% of renal cell cancers) or bilateral (1%).
— most renal cell carcinomas are centred on the cortex, transitional cell carcinomas on the pelvis.

Size
— length × width × depth (cm) or maximum dimension (cm).

Appearance
— cystic/solid/lobulated: renal cell carcinoma.
— necrotic/haemorrhagic/yellow: renal cell carcinoma.
— circumscribed/tan/central scar: oncocytoma and chromophobe/papillary carcinomas.
— white/granular/scirrhous: sarcomatoid and collecting duct carcinomas.
— papillary/sessile/scirrhous: renal pelvis carcinoma.

Edge
— circumscribed/irregular.

Compression/infiltration structures
— perinephric fat, capsule, cortex, medulla, pelvis, peripelvicalyceal fat (renal sinus), adrenal gland, renal vein.

2. HISTOLOGICAL TYPE

Renal malignancy of childhood is not discussed.

Renal cell carcinoma (Heidelberg/WHO classifications)

Adenocarcinoma
— 90% of cases.
— clear cell: 70% of cases. Solid/trabecular/alveolar/tubuloacinar/cystic patterns with a prominent sinusoidal vascular stroma and areas of haemorrhage. Glycogen and fat-rich clear to eosinophilic granular cytoplasm and variable nuclear morphology.
— papillary: 10–15% of cases. Potentially multifocal, bilateral and familial arising on a background of precursor papillary adenoma(s). Formerly termed chromophil carcinoma. Encapsulated, with solid and tubular patterns but at least 50–70% of the tumour area is papillary with stromal aggregates of foam cells, focal psammomatous microcalcification and haemorrhage. The commonest renal carcinoma in dialysis patients.
  type 1—basophilic cuboidal cell, uniform bland appearance and more often multifocal
  type 2—eosinophilic columnar cell with nuclear (pseudo) stratification.