Renal Cell Carcinoma: *Prognostic Factors*

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Prognostic Factors

- Stage
- Grade
- Sarcomatoid change
- Tumour type
- Tumour necrosis

RCC T Staging: TNM 7th Edition

- **TX:** Primary tumour cannot be assessed
- **T0:** No primary tumour in resection
- **T1:** Up to 7cm diameter, confined to kidney
  - **T1a:** up to 4cm; **T1b:** >4cm
- **T2:** >7 cm diameter, confined to kidney
  - **T2a:** up to 10cm; **T2b:** >10cm
- **T3:** Into major veins or perinephric tissues
  - **T3a**: tumour in renal vein or it muscle containing tributaries ; or invasion into perinephric fat or renal sinus
  - **T3b:** tumour in IVC below diaphragm
  - **T3c:** tumour in IVC above diaphragm or invasion of IVC wall
- **T4:** Tumour extends beyond Gerota fascia (including direct extension into ipsilateral adrenal gland

Perinephric Fat Invasion

- Tumour in direct contact with fat or irregular tongues of tumour into fat (with or without desmoplasia)
- Circumscribed pushing tumour beyond normal contour of kidney is not diagnostic of perinephric fat invasion

Renal Sinus Invasion

- Tumour involvement of any of the structures of renal sinus (sinus fat, loose connective tissue or sinus-based endothelium-lined space (regardless of size)

pT3 Vascular invasion

- Macroscopically identified tumour in thick walled veins in renal sinus is classified as vascular invasion
- Dependant on careful macroscopic examination
- Tumour in large muscular vein in renal sinus generally considered “grossly identified”

Renal Vein Margin

- Positive only if adherent tumour at actual margin
  - Loose tumour at margin is not margin positive

IVC Involvement

- T3c: tumour in IVC above diaphragm or invasion of IVC wall
  - IVC thrombus must be adequately sampled and assessed for IVC wall invasion

Adrenal Gland Involvement

- Tumour in **contralateral** adrenal gland: pM1
- **Direct** (continuous) extension into ipsilateral adrenal gland: pT4 (beyond Gerota fascia)
- **Discontinuous** tumour in ipsilateral adrenal gland separate from primary tumor: pM1

Fuhrman grading

- Based on worst area
- Scattered atypical cells may be ignored unless many present in a single HPF
- Based on nuclear size, nuclear pleomorphism and nucleolar size
- Best validated for conventional RCC
- Utility in papillary and chromophobe controversial

RCC Grading *ISUP Consensus (2012)*

- Grading based on **only** nucleolar prominence recommended for conventional and papillary
  - 1: nucleoli inconspicuous at x400
  - 2: nucleoli visible at x400, inconspicuous at x100
  - 3: nucleoli visible at x100
  - 4: rhabdoid, sarcomatoid, tumour giant cells or extreme nuclear pleomorphism
- Chromophobe RCC should not be graded

Sarcomatoid Change

- Sarcomatoid change may occur in any RCC type
- Amount of sarcomatoid change varies from 1-100%
  - No consensus on minimum amount required
  - Any sarcomatoid change should be reported
- Pure sarcomatoid RCC should be categorised as grade 4 unclassified RCC with sarcomatoid component
- ISUP: no consensus on definition of “sarcomatoid”
  - Some did not require a spindle cell morphology provided tumour was atypical and resembled any sarcoma

Tumour Type

- Conventional worse than papillary or chromophobe
  - Many studies show no stage for stage difference
  - Recent study from Mayo Clinic: conventional worse even after controlling for stage and grade
- Papillary carcinoma: Type 2 worse than type 1
- Poor prognosis: Renal medullary and collecting duct
- Good prognosis: clear cell papillary, tubulocystic

Tumour Necrosis

- Only coagulative tumour necrosis
  - Must be distinguished from degenerative changes
- Established poor prognostic factor for conventional RCC, probable poor prognostic factor for chromophobe RCC
- Not predictive of outcome for papillary RCC
- Careful gross examination and sampling critical for identification of necrosis
- ISUP: report % necrosis for conventional RCC

Reference

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