

# Kidney tumors

**Kidney tumors** - they come from the mesenchyme or from tubular cells

1. **benign** - *angiomyolipoma* (may rupture with bleeding), *oncocytoma*, tumor from juxtaglomerular cells (renin production → hypertension, hypokalaemia),
2. **malignant** - *adenocarcinoma* (from proximal tubule cells) - conventional (Grawitz - 70%), papillary
3. **metastases** - cancer of the *lungs, breast, stomach, hemoblastosis*.

## Benign kidney tumors

*Benign kidney tumors* are rare. They include:

- **angiomyolipoma**
- **hamartom**
- **fibroma**
- **hemangioma**
- **leiomyoma**
- **adenoma** (up to 3 cm in diameter)
- **oncocytoma** (a variant of an adenoma growing from intervening collecting duct cells) - it has a spherical shape and does not form metastases. It is often asymptomatic. The biggest problem is its inability to histologically distinguish from chromophobic kidney cancer, so *nephrectomy* is recommended.

The biological nature of the **adenoma** and **oncocytoma** is uncertain. The biological nature of **angiomyolipoma** is benign, but there is a risk of rupture and associated massive bleeding. An operational solution is recommended for these.

## Malignant tumors of the kidneys

### Kidney adenocarcinoma

[ edit embedded article] Kidney longitudinal section - carcinoma Histological preparation of chromophobic kidney cancer

Adenocarcinoma of the kidney spreads per continuity (into the surrounding structures, angioinvasion - IVC), lymphogenically few (lumbar nodes) and especially hematogenously (lungs, bones, liver). It comes from the cells of the tubules.

### Forms of cancer

- Light cell - makes up about 70%  
bright cells, thanks to glycogen and lipids
- Papillary - 10-15%  
papillary structure, contains psamomatous bodies.
- Granular - 8%  
acidophilic cytoplasm, cellular atypia.
- Chromophobic - 5%  
contains clear cells with perinuclear halo + granular cells
- Sarcomid - 1.5%  
vortex atypical spindle cells.
- From collecting channels - 0.5%  
structure with tubular and papillary pattern

### Histopathological grading

Histopathological grading of renal adenocarcinoma:

- GX : the degree of differentiation cannot be assessed,

- G1 : well differentiated,
- G2 : moderately differentiated,
- G3-4 : poorly differentiated to undifferentiated.

## TNM classification

Kidney tumors	
Primary tumor size	
T1	not more than 7 cm in the largest dimension, restricted to the kidney
T1a	not more than 4 cm in the largest dimension
T1b	more than 4 cm and not more than 6 cm in the largest dimension
T2a	more than 7 cm in the largest dimension, but not > 10 cm
T2b	more than 10 cm in the largest dimension, limited to the kidney
T3	the tumor spreads to the veins or tissue around the kidney, not growing through Gerot's fascia
T3a	the tumor grows into the adrenal glands or perirenal tissue
T3b	the tumor grows into the renal veins or the inferior vena cava, but only below the diaphragm
T3c	the tumor grows through the inferior vena cava above the diaphragm
T4	the tumor grows through Gerot's fascia
Lymph node involvement	
N0	without metastases; for pTNM, at least eight regional nodes need to be examined
N1	metastasis in one regional node
Distant metastases	
M0	absent
M1	present

## Clinical manifestations

- Up to 60% of patients are asymptomatic , the tumor is diagnosed as an incident (accidental finding on sonography or CT),
- Triassic (in advanced tumor) - macrohematuria , lumbalgia , palpable tumor - in about 6-10% of diagnosed tumors,
- hematuria,
- general symptoms: anemia, fatigue, anorexia, cachexia, etc.,
- pathological fracture and bone pain,
- symptoms of tumor thrombus: acute varicocele, lower limb edema, pulmonary embolism.

## Diagnostics

When finding an expansive kidney process:

- excretory urography ,
- Ultrasound , CT examination with contrast of the abdomen and chest ( staging ) ,
- angiography , cavography (injection of the inferior vena cava with a contrast agent - a tumor thrombus is being sought, now replaced by MRI).

## Therapy

1. Surgical ,
  - nephrectomy (preferably transabdominal approach, laparoscopically and openly transperitoneal) radical - including fat sheath and Gerot's fascia, for tumors over 5 cm in the upper pole for adrenalectomy, regional lymphadenectomy is no longer performed (kidney cancer metastasizes mainly hematogenously, laparoscopically) operate on tumors up to 8-10 cm, without invasion of perirenal structures and tumor thrombus,
  - conservation operations - pole resection (tumor up to 5 cm) or tumor excision from lumbotomy or laparoscopy, or ablation methods (RFA, cryoablation). Indications for conservation surgery are: anatomically or functionally solitary kidney, bilateral tumor and hereditary forms of tumors),
  - advanced cancer - resection of solitary metastasis, massive embolism hematuria , palliative radiation in bone pain,
2. chemo-radiotherapy - the tumor is chemo- and radio-resistant, vinblastine has an effect,
3. immunotherapy (IFN $\alpha$ , IL-2) - since the 90s, effect on the treatment of metastases, partial remission in 15% of patients (IL-2),
4. biologic therapy (since 2006) - sunitinib, sorafenib, doubled patient survival, angiogenesis inhibitors bevacizumab.

## Tumor thrombus

Kidney cancer grows into the veins:

- renal vein - nephrectomy,
- inferior vena cava below the level of the diaphragm - cavotomy,
- inferior vena cava above the level of the diaphragm - a two-cavity operation with extracorporeal circulation and assisted by a cardiac surgeon.

## Wilms' tumor (nephroblastoma)

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## References

### Source

- PASTOR, Jan. *Langenbeck's medical web page* [online]. [cit. 24.5.2010]. <<http://langenbeck.webs.com>>.

### Reference

- KLENER, P., et al. *Internal medicine*. 3rd edition. Prague : Galén, 2006. ISBN 80-7262-430-X.

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- Kidney (histological slide)