

Tumors of Kidney

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ABSTRACT

Kidney tumors, also known as renal tumors, are tumors, or growths, on or in the kidney. These growths can be benign or malignant (cancerous). They may be discovered on medical imaging incidentally (i.e. an incidentaloma), or may be present in patients as an abdominal mass, hematuria, abdominal pain, or manifest first in a paraneoplastic syndrome that seems unrelated to the kidney.

The most common form of kidney cancer in adults is renal cell carcinoma. Renal cell carcinoma usually does not cause obvious symptoms, especially in the early stages. As a result, the cancer may not be discovered until it is advanced.

Kidney cancer is a disease in which kidney cells become malignant (cancerous) and grows out of control, forming a tumor. Almost all kidney cancers first appear in the lining of tiny tubes (tubules) in the kidney. This type of kidney cancer is called renal cell carcinoma.

Both benign and malignant tumours occur in the kidney, the latter being more common. These may arise from renal tubules (adenoma, adenocarcinoma), embryonic tissue (mesoblastic nephroma, Wilms' tumour), mesenchymal tissue (angiomyolipoma, medullary interstitial tumour) and from the epithelium of the renal pelvis (urothelial carcinoma).

Benign renal neoplasms constitute a rather large and heterogeneous group of renal lesions that can be found in the kidney. The Bosniak classification for renal cystic lesions is the most useful and widely employed method for characterizing renal cystic lesions.

Malignant tumors include renal cell carcinoma, risk factor smoking, obesity, using certain pain medication, having a family history of kidney cancer, high blood pressure, lymphoma. Symptoms include blood in urine, lump in side or abdomen, pain, extreme fatigue, anemia.

Another malignant tumors are Wilm's Tumour one of the commonest intra-abdominal tumours < 10 yrs age, but still not common, occasionally bilateral, mostly 1-5 years (can even be congenital), usually quite big tumor. Symptoms are fever, abdominal pain, nausea & vomiting, blood in urine.

Prevent kidney cancer quit smoking, maintain a healthy weight, control high blood pressure, life style modification can reduce incidence of cancer.

Keywords: Tumors of Kidney

INTRODUCTION

Kidney tumors, also known as renal tumors, are tumors, or growths, on or in the kidney. These growths can be benign or malignant (cancerous). They may be discovered on medical imaging incidentally (i.e. an incidentaloma), or may be present in patients as an abdominal mass, hematuria, abdominal pain, or manifest first in a paraneoplastic syndrome that seems unrelated to the kidney.

The most common form of kidney cancer in adults is renal cell carcinoma. Renal cell carcinoma usually does not cause obvious symptoms, especially in the early stages. As a result, the cancer may not be discovered until it is advanced.

Kidney cancer is a disease in which kidney cells become **malignant** (cancerous) and grows out of control, forming a tumor. Almost all kidney cancers first appear in the lining of tiny tubes (tubules) in the kidney. This type of **kidney cancer** is called **renal cell carcinoma**.

Both benign and malignant tumours occur in the kidney, the latter being more common. These may arise from renal

tubules (adenoma, adenocarcinoma), embryonic tissue (mesoblastic nephroma, Wilms' tumour), mesenchymal tissue (angiomyolipoma, medullary interstitial tumour) and from the epithelium of the renal pelvis (urothelial carcinoma). Besides these tumours, the kidney may be the site of the secondary tumours.

1. Classification

Benign

- > Renal oncocytoma
- > Cystic nephroma
- > Angiomyolipoma
- > Metanephric adenoma
- > Renal medullary fibroma

Malignant (cancerous) - The most frequent, malignant, primary kidney cancer is renal cell carcinoma (**RCC**) - which has several subtypes:

A. Renal cell carcinoma RCC

- Clear cell RCC.
- Papillary RCC

- Chromophobe RCC
- Collecting duct RCC
- Metastatic tumor, e.g. ovarian carcinoma.

B. Urothelial cancer of kidney

1. Childhood renal cancer – wilms' tumor
2. Metastatic tumor, e.g. Ovarian carcinoma, bone cancer

2. BENIGN TUMOR

Benign renal neoplasms constitute a rather large and heterogeneous group of renal lesions that can be found in the kidney. These include the simple renal cyst, selected complex renal cysts, cortical and metanephric adenomas,

angiomyolipoma, oncocytoma, the rarer cystic nephroma, mixed epithelial-stromal tumor, and leiomyoma.

Renal cysts remain the most common benign renal lesions, representing more than 70% of asymptomatic renal masses.

- The overwhelming majority of simple or minimally complex cysts require no further follow-up or therapy once diagnosed.
- The Bosniak classification for renal cystic lesions is the most useful and widely employed method for characterizing renal cystic lesions and assessing the likelihood of the presence of a concomitant malignancy within the cyst.

Table – Bosniak classification

Bosniak classification	Imaging characteristic	Incidence of malignancy	Therapy
1	Simple cyst with a hairline thin wall that does not contain septa, calcification or solid components.	1.7%	No therapy or follow-up required
2	Cyst may contain a few hairline thin septa and fine calcification, or a short segment of slightly thickened calcification may be present in wall or septa.	18.5%	No therapy or follow-up required
2.a	Cyst may contain multiple hairline thin septa. Their wall or septa may contain calcification that may be thick and nodular, but no measurable contrast enhancement is present.	18.5%	Repeat imaging to assess stability of size and radiographic characteristic
3	"Indeterminate" cystic masses have thickened irregular or smooth wall or septa in which measurable contrast enhancement is present.	33%	Excision or ablation
4	Clearly malignant cystic masses can have all the criteria of category 3 but also contain enhancing soft tissue components.	92.5%	Excision or ablation

ONCOCYTOMA

Renal oncocytoma is the most common benign tumor that appears as an enhancing renal mass on cross-sectional imaging and is presumed to be RCC until surgical excision, representing one of the ultimate challenges in preoperative diagnosis for the urologist. It accounts for 3% to 7% of kidney tumors. Renal oncocytoma is a common benign renal tumor that is clinically and radiographically indistinguishable from RCC.

- There may be a higher incidence of oncocytoma in older patients with a small renal mass as opposed to younger patients.
- Oncocytomas are derived from the distal renal tubules, similar to chromophobe RCC, and may represent a spectrum of neoplasia as evidenced in the Birt-Hogg-Dubé genetic syndrome. However, there is no evidence that oncocytomas undergo malignant transformation in sporadic cases.
- **If oncocytoma is suspected preoperatively, a percutaneous core biopsy in addition to fine-needle aspiration may reliably provide a diagnosis when core tissue is available for additional immunohistochemical studies.**
- Recent advancements in immunohistochemical markers have greatly improved the diagnostic accuracy of pathologic diagnosis from pathologic specimens and even core biopsy specimens.
- Frozen section analysis at the time of surgery may not reliably distinguish oncocytoma from RCC and should not be used to guide surgical strategy.

CYSTIC NEPHROMA

Cystic nephroma is a characteristic renal lesion with a bimodal age distribution and a benign clinical course. Diagnostic peaks occur primarily in the first 2 to 3 years of life, predominantly in boys, and again in the fourth and fifth decades with a significant (8 : 1) female prevalence. As with other renal lesions, presenting signs can include abdominal mass, pain, and hematuria, but the majority of cystic nephromas are incidental findings.

Several familial cases have been reported in the literature, and there have been anecdotal reports of sarcoma and clear cell carcinoma arising from cystic nephroma. Most cystic nephromas are solitary, centrally located, and widely variable in size (mean size 9 cm) and commonly demonstrate curvilinear calcifications, herniation into the renal collecting system, and septal enhancement. Consequently, reliable radiologic differentiation between cystic nephroma and cystic RCC in adults or Wilms tumor in children is not possible.

LEIOMYOMA

Leiomyomas are rare, benign tumors that may arise from smooth muscle cells anywhere along the genitourinary tract. In the kidney these tumors most commonly arise from the renal capsule, but renal pelvis and renal vein sites of origin have been reported. Leiomyomas are found at autopsy with a frequency of 4.2% to 5.2%, but only a minority are discovered clinically, representing approximately 1.5% of all benign renal tumors treated surgically.

- The characteristic appearance is of a small solid renal mass arising from the renal capsule.

- Nephron-sparing approaches are preferred when technically possible.

OTHER BENIGN RENAL TUMORS

A multitude of rare benign tumors derived from the various mesenchymal components of the kidney have been described and include multiple histiotypes, such as hemangioma, lymphangioma, juxtaglomerular cell tumor, renomedullary interstitial cell tumor, intrarenal schwannoma, and solitary fibrous tumor.

- Numerous rare benign tumors derived from the various mesenchymal components of the kidney have been described.
- Radiologic differentiation from renal malignancy is not possible.
- Reninoma, a benign tumor of the renal juxtaglomerular cell apparatus, is an important but rare cause of secondary hypertension and hypokalemia.

3. MALIGNANT TUMORS

Renal cell carcinoma in adult (RCC)

Risk factors of RCC:

- Smoking .
- Sex: Men are about twice as likely as women to get kidney cancer.
- Obesity, Extra weight may cause changes to hormones that increase your risk.
- Using certain pain medications for a long time. This includes over-the-counter drugs in addition to prescription drugs.
- Having advanced kidney disease or being on long-term dialysis, a treatment for people with kidneys that have stopped working
- Having certain genetic conditions, such as von Hippel-Lindau (VHL) disease or inherited papillary renal cell carcinoma
- Having a family history of kidney cancer. The risk is especially high in siblings.
- Exposed to certain chemicals, such as asbestos, cadmium, benzene, organic solvents, or certain herbicides.
- Having high blood pressure or medication used to treat it is the source of the increased risk.
- Black, The risk in blacks is slightly higher than in whites.
- Lymphoma. For an unknown reason, there is an increased risk of kidney cancer in patients with lymphoma.

4. Symptoms

In many cases, people may have no early symptoms of kidney cancer. As the tumor grows larger, symptoms may appear. Patient may have one or more of these kidney cancer symptoms:

- Blood in urine
- A lump in side or abdomen
- A loss of appetite
- Pain
- Weight loss that occurs for no known reason
- Fever that lasts for weeks and isn't caused by a cold or other infection
- Extreme fatigue
- Anemia
- Swelling in ankles or legs flank mass & Hematuria is classical triad of renal tumors, however it is also known as triad of death as it indicates advanced disease.

Kidney cancer that spreads to other parts of your body may cause other symptoms, such as:

- Shortness of breath
- Coughing up blood
- Bone pain

5. Investigation

To confirm a diagnosis of kidney cancer, we need a-

1. Health history
2. Physical exam
3. Radiological investigation

Other tests like:

- **Urine tests** check for blood in your urine or other signs of problems.
- **Blood tests** show how well your kidneys are working.
- **Intravenous pyelogram (IVP)** involves X-raying your kidneys after the doctor injects a dye that travels to your urinary tract, highlighting any tumors.

1. Ultrasound uses sound waves to create a picture of your kidneys. It can help tell if a tumor is solid or fluid-filled.
2. **Triphasic CT scan** uses X-rays and a computer to create a series of detailed pictures of your kidneys. It consists of Plain KUB, contrast CT KUB and Delayed imaging. CT scans have virtually replaced pyelogram and ultrasound as a tool for diagnosing kidney cancer. Enhancement in contrast CT is diagnosis of RCC only limitation is that it can be done in patient with renal failure.
3. **Magnetic resonance imaging (MRI)** uses strong magnets and radio waves to create detailed images of soft tissues in body. It's not very popular.
3. **Renal arteriogram.** This test is used to evaluate the blood supply to the tumor. It helps in planning surgery for renal tumors.



Fig:- Renal cell carcinoma - Renal cell carcinoma is the most common primary renal tumor in adults and may be occult.

6. Stages of kidney tumor

These are the stages of kidney cancer. The higher the stage, the more advanced the cancer.

Stage I

A tumor 7 centimeters or smaller that is only in the kidney

Stage II

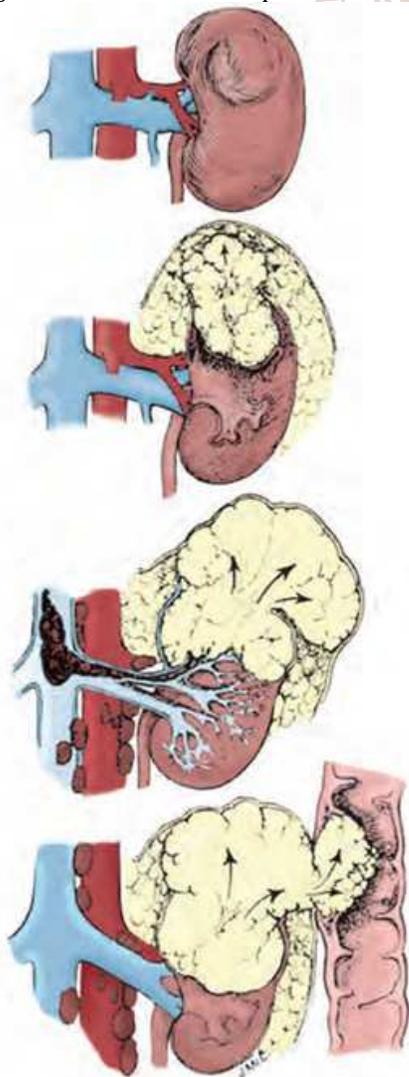
A tumor larger than 7 centimeters that is only in the kidney

Stage III

- A tumor that is in the kidney and in at least one nearby lymph node
- A tumor that is in the kidney's main blood vessel and may also be in nearby lymph node
- A tumor that is in the fatty tissue around the kidney and may also involve nearby lymph nodes
- A tumor that extends into major veins or perinephric tissues, but not into the ipsilateral adrenal gland and not beyond Gerota's fascia

Stage IV

- Cancer has spread beyond the fatty layer of tissue around the kidney, and it may also be in nearby lymph nodes
- Cancer may have spread to other organs, such as the bowel, pancreas, or lungs
- Cancer has spread beyond Gerota's fascia (including contiguous extension into the ipsilateral adrenal gland).



STAGING OF RENAL CELL CARCINOMA

- Stage I Tumor within capsule
- Stage II Tumor invasion of perinephric fat (confined to Gerota fascia)
- Stage III Tumor involvement of regional lymph nodes and/or renal vein and cava
- Stage IV Adjacent organs or distant metastases

7. Treatments of cancer of kidney

- For localized disease
- For metastatic disease
- For very advanced disease

Now TNM classification is very commonly used it is s under

T: PRIMARY TUMOR

- TX Primary tumor cannot be assessed
- T0 No evidence of primary tumor
- T1a Tumor ≤ 4.0 cm and confined to the kidney
- T1b Tumor > 4.0 cm and ≤ 7.0 cm and confined to the kidney
- T2a Tumor > 7.0 cm and ≤ 10.0 cm and confined to the kidney
- T2b Tumor > 10.0 cm and confined to the kidney
- T3a Tumor grossly extends into the renal vein or its segmental (muscle-containing) branches, or tumor invades perirenal and/or renal sinus fat but not beyond Gerota fascia
- T3b Tumor grossly extends into the vena cava below the diaphragm
- T3c Tumor grossly extends into the vena cava above the diaphragm or invades the wall of the vena cava
- T4 Tumor invades beyond Gerota fascia (including contiguous extension into the ipsilateral adrenal gland).

N: REGIONAL LYMPH NODES

- NX Regional lymph nodes cannot be assessed
- N0 No regional lymph nodes metastasis
- N1 Metastasis in regional lymph node(s)

M: DISTANT METASTASES

- MX Distant metastasis cannot be assessed
- M0 No distant metastasis
- M1 Distant metastasis present

STAGE GROUPING

- Stage I T1 N0 M0
- Stage II T2 N0 M0
- Stage III T1 or T2 N1 M0
- T3 Any N M0
- Stage IV T4 Any N M0
- Any T Any N M1

For localized disease

A. Surgery for kidney cancer

These are the main types of surgery for kidney cancer. Which type you have depends on how advanced your cancer is.

- **Radical nephrectomy** removes the kidney, adrenal gland, and surrounding tissue. It also often removes nearby lymph nodes. It is the most common surgery for kidney cancer and can now be done through a small incision with a laparoscope.
- **Partial nephrectomy** removes the cancer in the kidney along with some tissue around it. This procedure is used for patients with smaller tumors (less than 4 cm) or in

those patients in which a radical nephrectomy might hurt the other kidney.

Patient can survive with just a part of one kidney as long as it is still working. If the surgeon removes both kidneys or if both kidneys are not working, patient will need a dialysis or a new kidney (kidney transplant). Patient is not fit for major surgery for cancer then another option to help destroy the tumor is:

- A. **Cryotherapy** uses extreme cold to kill the tumor.
- B. **Radiofrequency ablation** uses high-energy radio waves to "cook" the tumor.
- C. **Arterial embolization** involves inserting material into an artery that leads to the kidney. This blocks blood flow to the tumor. This procedure may be done to help shrink the tumor before surgery.

All these are experimental and result of these are inferior to surgery.

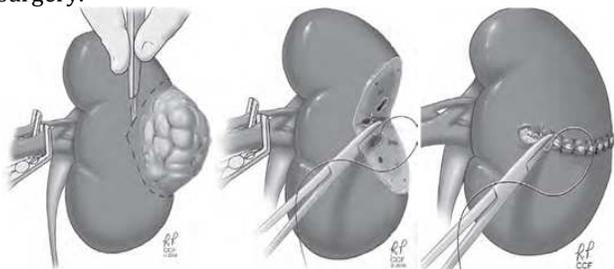


Figure: - Essential steps in partial nephrectomy as illustrated with open approach.

- A. Temporary occlusion of the vascular pedicle and excision of the tumor with a rim of normal Parenchyma.
- B. Closure of the collecting system and ligation of transected vessels.
- C. Capsular reconstruction.

For Metastatic disease

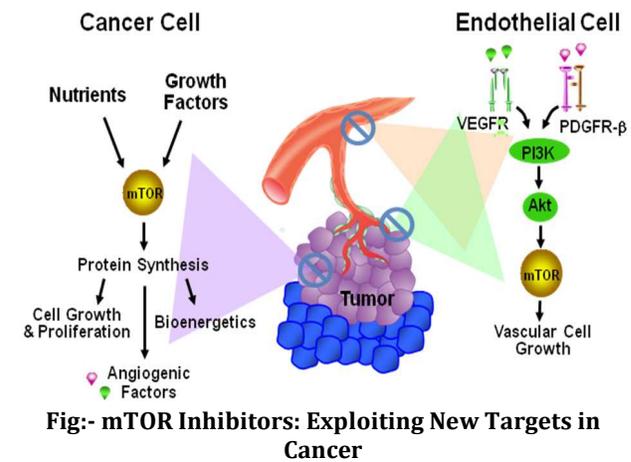
Biologic therapy for kidney cancer

This therapy uses immune system to fight cancer by boosting, directing, or restoring your body's natural defenses. Substances for biologic therapy are made body or in a lab. Examples of biologic therapy for metastatic kidney cancer include interferon alpha or interleukin-2. There are many new immunotherapy's being actively studied for kidney cancer.

Targeted therapy for kidney cancer

This therapy uses drugs or other substances to find and target cancer cells with less toxicity to normal cells. One type of targeted therapy is **anti-angiogenic agents**. These keep blood vessels from feeding a tumor, causing it to shrink or stop growing. Another type of targeted agent is known as multi kinase inhibitors or tyrosine kinase inhibitors. These are oral drugs that block an enzyme pathway which allows cancer cells to grow. A third type of targeted therapy is known as m-TOR inhibitors. There are two of these drugs available, one oral and one by IV. They block a pathway which allows blood vessels to help tumor cells grow. Each of these drugs has a unique place in the management of advanced kidney cancer.

e.g – Tacrolimus (m-TOR inhibitor), sunitinib, axitinib



Radiation therapy for kidney cancer

Often used to help with symptoms of kidney cancer or in patients who cannot have surgery, this treatment uses high-energy X-rays or other types of radiation to kill cancer cells or halt their growth. External radiation therapy sends radiation to the cancer from a machine outside the body. Not very useful for primary tumor, however useful for bone metastasis.

Chemotherapy for kidney cancer

This therapy uses drugs to kill cancer cells or stop them from multiplying. Less effective for kidney cancer than for other types of cancer, chemotherapy is mostly used for a certain type of kidney cancer in which there spindle cells (sarcomatoid variant).

Prognosis

Finding	Robson Stage	5-Year Survival (%)
Organ confined (over all)	I	70-90
≤4.0 cm		50-70
>10.0 cm	II	50-70
Invasion of perinephric or renal sinus fat.	III	30-40
Invasion of renal vein or branches	IV	10-20
Locally advanced (invasion beyond Gerota fascia)		

8. MALIGNANT RENAL TUMORS OF CHILDREN Nephroblastoma (Wilms' tumour)

- > one of commonest intra-abdominal tumours < 10 yrs age, but still not common
- > occasionally bilateral
- > mostly 1-5 years (can even be congenital)
- > highly malignant tumour of mesoderm (renal blastema) – often already spread to lungs at time of diagnosis.
- > usually quite big tumour
- > often presents as abdominal mass
- > extension through renal capsule common
- > despite malignancy, excellent results if it can be treated aggressively
- > combination of radiotherapy, nephrectomy and chemotherapy

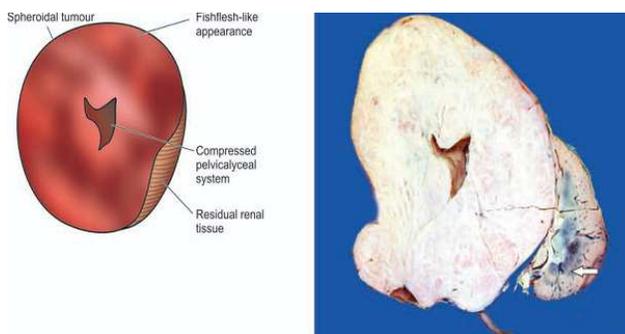


Fig:- Nephroblastoma (Wilms' tumour). The kidney is enlarged and has ovoid and nodular appearance.

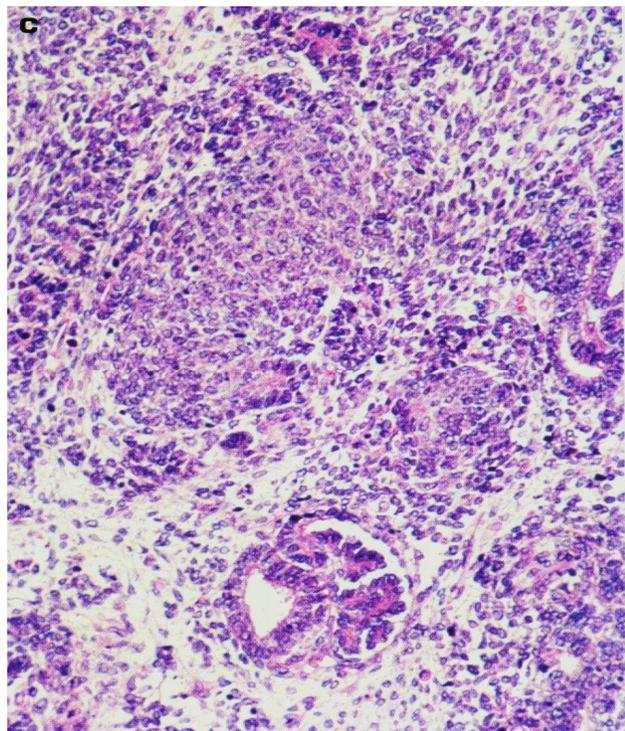


Fig:- Wilms' tumor (Histology shows hypercellular areas comprising undifferentiated blastema, loose stroma with undifferentiated glomeruloid body.)

Signs and symptoms

Typical signs and symptoms of Wilms' tumor include the following:

- An abnormally large abdomen
- Loss of appetite
- Abdominal pain
- Fever
- Nausea and vomiting
- Blood in the urine (in about 20% of cases)
- High blood pressure in some cases (especially if synchronous or metachronous bilateral kidney involvement)

Pathogenesis

Most nephroblastoma are on one side of the body only and are found on both sides in less than 5% of cases. They tend to be encapsulated and vascularized tumors that do not cross the midline of the abdomen. In cases of metastasis it is usually to the lung. A rupture of Wilms tumor puts the patient at risk of bleeding and peritoneal dissemination of the tumor. In such cases, surgical intervention by a surgeon who is experienced in the removal of such a fragile tumor is imperative.

Pathologically, a triphasic nephroblastoma comprises three elements:

- blastema
- mesenchyme
- epithelium

Wilms' tumor is a malignant tumor containing metanephric blastema, stromal and epithelial derivatives. Characteristic is the presence of abortive tubules and glomeruli surrounded by a spindled cell stroma. The stroma may include striated muscle, cartilage, bone, fat tissue, fibrous tissue. Dysfunction is caused when the tumor compresses the normal kidney parenchyma.

The mesenchymal component may include cells showing rhabdomyoid differentiation or malignancy (rhabdomyosarcomatous Wilms).

Wilms tumors may be separated into 2 prognostic groups based on pathologic characteristics:

- Favorable - Contains well developed components mentioned above
- Anaplastic - Contains diffuse anaplasia (poorly developed cells)

Staging

Staging is a standard way to described the extent of spread of wilms tumors and to determine prognosis and treatments. Staging is based on anatomical finding and cell pathology.

Stage I (43% of patients)

Stage I Wilms tumor, all of the following criteria must be met:

- Tumor is limited to the kidney and is completely excised.
- The surface of the renal capsule is intact.
- The tumor is not ruptured or biopsied (open or needle) prior to removal.
- No involvement of extrarenal or renal sinus lymph-vascular spaces
- No residual tumor apparent beyond the margins of excision.
- Metastasis of tumor to lymph nodes not identified.

Stage II (23% of patients)

Stage II Wilms tumor, 1 or more of the following criteria must be met:

- Tumor extends beyond the kidney but is completely excised.
- No residual tumor apparent at or beyond the margins of excision.
- Any of the following conditions may also exist:
- Tumor involvement of the blood vessels of the renal sinus and/or outside the renal parenchyma.
- Extensive tumor involvement of renal sinus soft tissue.

Stage III (20% of patients)

Stage III Wilms tumor, 1 or more of the following criteria must be met:

- Inoperable primary tumor.
- Lymph node metastasis.
- Tumor is present at surgical margins.
- Tumor spillage involving peritoneal surfaces either before or during surgery, or transected tumor thrombus.
- The tumor has been biopsied prior to removal or there is local spillage of tumor during surgery, confined to the flank.

Stage IV (10% of patients)

Stage IV Wilms tumor is defined as the presence of hematogenous metastases (lung, liver, bone, or brain), or lymph node metastases outside the abdomenopelvic region.

Stage V (5% of patients)

Stage V Wilms tumor is defined as bilateral renal involvement at the time of initial diagnosis. Note: For patients with bilateral involvement, an attempt should be made to stage each side according to the above criteria (stage I to III) on the basis of extent of disease prior to biopsy.

Prognosis

Stage	Histopathology	4 Year relapse-free survival (RFS) or event-free survival(EFS)	4 Year overall survival(OS)	Treatment
Stage I	Favorable histology in children younger than 24 months or tumor weight less than 550g	85%	98%	Surgery only (should be done only within the context of a clinical trial)
	Favorable histology in children older than 24 months or tumor weight more than 550g	94% RFS	98%	Nephrectomy + lymph node sampling followed by regimen EE-4A
	Diffuse anaplastic	68% EFS	80%	Nephrectomy + lymph node sampling followed by regimen EE-4A and radiotherapy
Stage II	Favorable histology	86% RFS	98%	Nephrectomy + lymph node sampling followed by regimen EE-4A
	Focal anaplastic	80% EFS	80%	Nephrectomy + lymph node sampling followed by abdominal radiotherapy and regimen DD-4A
	Diffuse anaplastic	83% EFS	82%	Nephrectomy + lymph node sampling followed by abdominal radiotherapy and regimen I
Stage III	Favorable histology	87% RFS	94%	Nephrectomy + lymph node sampling followed by abdominal radiotherapy and regimen DD-4A
	Focal anaplastic	88% RFS	100% (8 people in study)	Nephrectomy + lymph node sampling followed by abdominal radiotherapy and regimen DD-4A
	Focal anaplastic (preoperative treatment)	71% RFS	71%	Preoperative treatment with regimen DD-4A followed by nephrectomy + lymph node sampling and abdominal radiotherapy
	Diffuse anaplastic	46% EFS	53%	Preoperative treatment with regimen I followed by nephrectomy + lymph node sampling and abdominal radiotherapy
	Diffuse anaplastic	65% EFS	67%	Immediate nephrectomy + lymph node sampling followed by abdominal radiotherapy and regimen I
Stage IV	Favorable histology	76% RFS	86%	Nephrectomy + lymph node sampling, followed by abdominal radiotherapy, bilateral pulmonary radiotherapy, and regimen DD-4A
	Focal anaplastic	61% EFS	72%	Nephrectomy + lymph node sampling, followed by abdominal radiotherapy, bilateral pulmonary radiotherapy, and regimen DD-4A
	Diffuse anaplastic	33% EFS	33%	Immediate nephrectomy + lymph node sampling followed by abdominalradiotherapy, whole-lung radiotherapy, and regimen I
	Diffuse anaplastic (preoperative treatment)	31% EFS	44%	Preoperative treatment with regimen I followed by nephrectomy + lymph node sampling followed by abdominalradiotherapy, whole-lung radiotherapy

Stage V	Overall	61% EFS	80%	
	Favorable histology	65%	87%	Bilateral renal biopsies and staging of each kidney followed by preoperative treatment with regimen EE-4A (if disease in both kidneys ≤ stage II) or regimen DD-4A (if disease in both kidneys > stage II), followed by second-look surgery and possibly more chemotherapy and/or radiotherapy
	Focal anaplastic	76%	88%	Bilateral renal biopsies and staging of each kidney followed by preoperative treatment with regimen I, followed by second-look surgery and possibly more chemotherapy and/or radiotherapy
	Diffuse anaplastic	25%	42%	Bilateral renal biopsies and staging of each kidney followed by preoperative treatment with regimen I, followed by second-look surgery and possibly more chemotherapy and/or radiotherapy

9. Prevent Kidney Cancer

It is not clear how to prevent the disease. However, certain factors are linked to kidney cancer, so you can take certain steps to lower your risk –

Quit smoking. If you smoke, quit. Many options for quitting exist, including support programs, medications and nicotine replacement products. Tell your doctor you want to quit, and discuss your options together.

Maintain a healthy weight. Work to maintain a healthy weight. If you're overweight or obese, reduce the number of calories you consume each day and try to exercise most days of the week. adults should do a minimum of 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity, such as cycling or brisk walking, every week.

Control high blood pressure. If your blood pressure is high, you can discuss options for lowering your numbers. Lifestyle measures such as exercise, weight loss and diet changes can help. Some people may need to add medications to lower their blood pressure.

Avoid eating foods high in saturated fat because it will increase your cholesterol level. High-fat foods include:

- meat pies
- sausages and fatty cuts of meat
- butter
- ghee – a type of clarified butter often used in Indian cooking
- lard
- cream
- hard cheese
- cakes and biscuits
- foods that contain coconut or palm oil

Alcohol, There's evidence to suggest that drinking a moderate amount of alcohol, such as 4-5 glasses of wine a month, will help reduce your risk of developing kidney cancer.

11. CONCLUSION

1. Renal cancer is a common cancer.
2. Malignant renal tumors are more common compared to benign tumors.
3. Prognosis of renal tumors depends on stage.

4. In adult renal cancer (RCC) surgery remains the main stage of treatment.

Other effective therapy for RCC in metastatic disease is angiogenesis inhibition and biological agent.

5. In childhood renal tumors surgery, chemo and radiation all are effective.

6. Prognosis is good compared to adult RCC.

7. Benign renal tumors are less common and difficult to diagnose.

8. Life style modification can reduce incidence of cancer.

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