Nephrectomy (Kidney Removal)

SIGNALMENT

Two adult dogs were presented to CGS hospital, Gurgaon with the history of haematuria, recurrent urinary tract infection and vomition.

DIAGNOSTICS

- Haematology revealed increased creatinine, BUN and urea
- Urine analysis culture showed Klebsiella sp. and E.coli sp.
- Radiography showed increased kidney size
- Ultrasonography

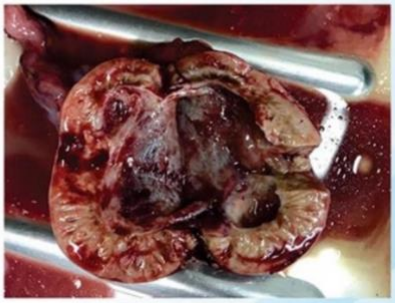
Ultrasound revealed hyperechoic cortical region, no demarcation between cortex and medulla, cranial subcapsular fluid accumulation and right renomegaly in one case and irregular left renal capsule, hypoechoic cortical echogenisity pushed by highly dilated medullary region with echogenic fluid content. Tortuous and dilated left ureter in one case.

SURGERY

Unilateral nephrectomy was performed under Isoflurane gaseous anesthesia in both cases.

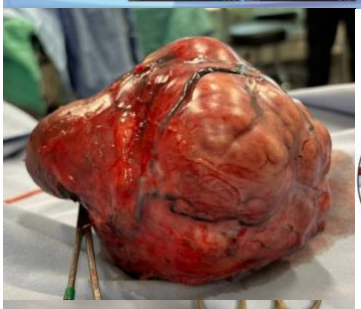
POST SURGERY

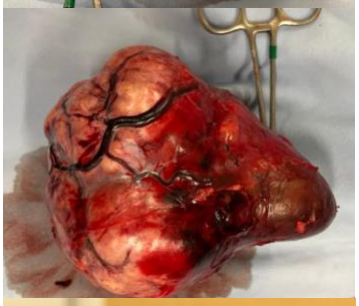
Aggressive intravenous fluid therapy, antibiotics, analgesics and supportive medication were given.
Both the dogs recovered uneventfully.

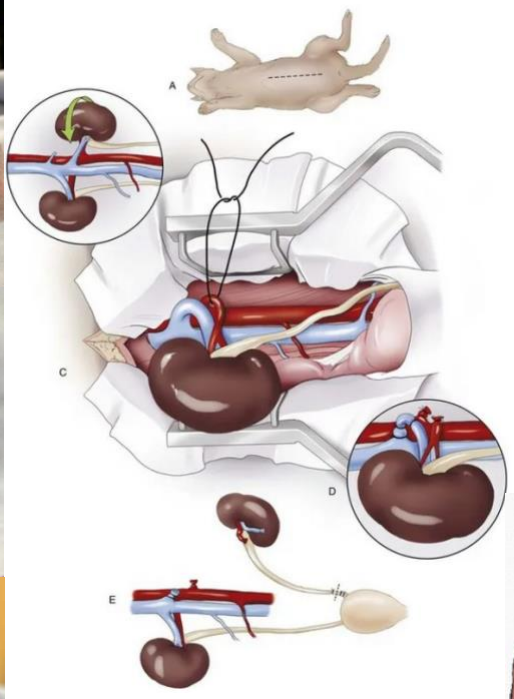


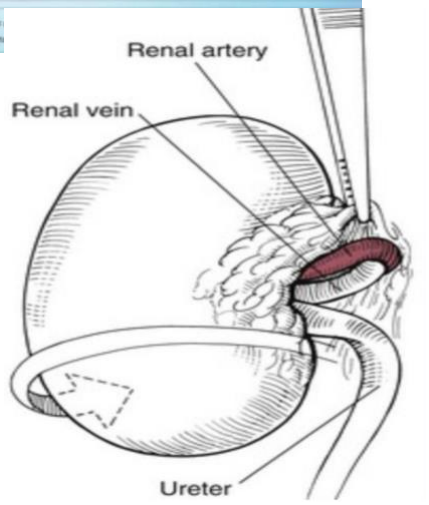
HISTOPATHOLOGY

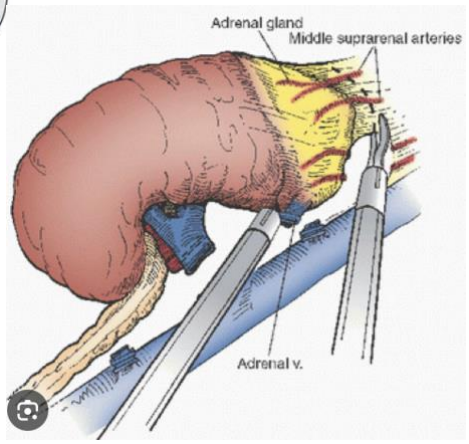
Affected kidney histopathology revealed renal carcinoma and pyelonephritis.











- **Primary renal neoplasia**, or cancer that originates in the kidney, is rare in the dog and cat, accounting for less than 2.5 percent of all tumors. The most common tumors in dogs in descending order are renal carcinoma, transitional cell carcinoma, renal adenoma, sarcoma, nephroblastoma, lymphoma and fibroma. The majority of tumors seen are malignant, and metastatic tumors that spread from another place are more common than primary tumors. There are a host of possible presentations associated with renal tumors.
- Individuals may have no clinical signs early in the disease process. The **classic triad** of physical findings in cats and dogs with renal tumors includes abdominal mass, weight loss, and in a subset of cases, blood in the urine (hematuria), although abdominal and/or back pain is not uncommon.
- **Anemia** (low red blood cell count) and **renal failure** (azotemia) are not uncommonly found in these patients, especially when both kidneys are involved. Depending on the specific case, specific diagnostics and therapeutics would be recommended and tailored to the individual.

Differential Diagnosis:

Several diseases and disorders have similar symptoms to renal neoplasia. These include:

- **Pyelonephritis**, or an infection of the kidney
- **Hydronephrosis,** which is the enlargement of the pelvis of the kidney with urine, as a result of obstruction of the ureter – the tiny tubular structure that allows the passage of urine from the kidney to the urinary bladder
- **Renal hematomas** or blood clots secondary to trauma
- **Ethylene glycol** toxicosis after ingestion of antifreeze that causes bilateral kidney enlargement (renomegaly) due to the formation of calcium oxalate crystals, which are particles that form in the kidneys from antifreeze
- **Leptospirosis,** an infectious disorder that causes bilateral renomegaly and renal failure in dogs
- **Urolithiasis** (stones) anywhere throughout the urinary tract, especially in the kidney
- **Chronic renal failure** associated with or as a result of renal neoplasia
- **Renal abscesses**, or localized pockets of pus within the kidney, that usually cause unilateral renomegaly in cats and dogs.
- **Perirenal pseudocysts**, the accumulation of fluid between the kidney and its surrounding capsule.
- **Glomerulonephritis**, which is an inflammation of the glomeruli of the kidney
- **Amyloidosis**, which is the deposition or collection of a type of protein in organs and tissues that compromises normal function
- Other **abdominal masses** in the pancreas, ovaries, liver or adrenal glands that can cause abdominal distension and similar signs

- Other causes of **abdominal discomfort**, including pancreatitis and peritonitis, which is inflammation of the abdominal cavity
- Disorders associated with **back pain** such as inter-vertebral disc protrusion or a spinal infection or tumor
- Disorders that cause **excessive thirst and urination** to include hyperadrenocorticism (Cushing's disease), diabetes mellitus and liver disease
- **Coagulopathies**, or clotting disorders, such as thrombocytopenia (decreased platelet count) or warfarin toxicity (rat poison), that cause bloody urination
- **Polycythemia** is a disorder that causes the red blood cell count to rise. It can be a primary or secondary disorder, and is occasionally seen associated with some renal tumors.

Diagnosis:

- **Certain diagnostic tests** must be performed to make a definitive diagnosis of renal neoplasia and exclude other disease processes that may cause similar symptoms. Ultimately, microscopic examination of both cells and tissue is necessary to confirm a diagnosis of renal neoplasia, and to document the tumor type. A complete history, description of clinical signs, and thorough physical examination are all an important part of obtaining a diagnosis of renal neoplasia. In addition, the following tests are recommended:
- A **complete blood count** (CBC) may be within normal limits, however may reveal anemia (low red blood cell count), polycythemia (elevated red blood cell count) and/or an elevated white blood cell count.
- A **biochemical profile** may be within normal limits, but it may reveal elevations in kidney enzymes or electrolyte abnormalities.
- A **urinalysis** may be normal or reveal blood in the urine, white blood cells in the urine, protein in the urine, and bacteria in the urine. Infrequently, neoplastic cells may be seen in the urinalysis.
- A **bacterial urine culture** is performed to assess for the presence of urinary tract infections, which are generally present in one-third of patients with renal tumors.
- Abdominal radiographs (X-rays) may be helpful in evaluating for renal tumors; however, if they are within normal limits, that does not rule out the possibility of a tumor.
- **Chest X-rays** should be obtained on these patients, as many renal tumors are malignant and can metastasize or spread to the chest.
- **Abdominal ultrasound** is helpful in evaluating the kidney and confirming the presence of a tumor. It is also helpful in evaluating the other kidney, lymph nodes and other abdominal organs for evidence of metastasis. With the guidance of ultrasound, it is often possible to obtain a sample of the tumor via aspirate or biopsy. Ultrasound is often considered the diagnostic tool of choice. The ultrasound itself is a noninvasive procedure, although sampling of the tumor tissue will often necessitate sedation or general anesthesia, and is associated with some minor risks. These procedures generally necessitate the expertise of a specialist or referral hospital.
- Your veterinarian may recommend **additional tests** to exclude or diagnose other existing conditions. These tests are not necessary in every case, but they may be of benefit in certain individuals and are selected on a case-by-case basis. These include:

- **Excretory urography**. An intravenous dye study "lights up" the upper urinary tract, consisting of the kidneys and ureters. It is very helpful in confirming that a mass originates in the kidney and also provides a rough estimate of renal function in the other kidney. The procedure is not recommended if there is significant renal failure, as it may be dangerous to the patient. This procedure usually requires anesthesia, and may necessitate referral.
- **Abdominal computed tomography** (CT) is helpful in ruling out abdominal metastasis. This procedure necessitates general anesthesia and referral to an institution capable of performing it.

Treatment:

- Animals with renal tumors are **best treated with surgery** if the tumor has not metastasized and is unilateral. Specific therapy depends on the patient, tumor type, kidney involvement and associated clinical signs. Recommendations by your veterinarian should be followed very closely, and any questions or concerns that arise during the treatment protocol should be addressed immediately. Depending on the patient, recommended treatment options may vary.
- **Fluid therapy** is indicated in those patients who are dehydrated, have severe infections or concurrent kidney failure.
- The **function of the other kid**ney should always be confirmed prior to removing the affected kidney. Excretory urography generally is the best means of evaluating kidney function.
- In some cases, such as in cases of **nephroblastomas** that are detected early, surgery may be curable. In others, surgery may prolong the life of affected individuals, although recurrence or metastasis often occurs.

Surgery:

- **Nephrectomy** or surgical removal of a kidney is the best treatment for a kidney tumor, providing that the patient is not in kidney failure. An incision is made along the abdomen to expose the internal organs. The blood vessels and ureters of the affected kidney are tied off and the kidney is then removed. While in our hospital, your companion will continue to receive intravenous fluids, electrolytes and in some cases plasma or an artificial plasma product called Hetastarch. Most patients that have abdominal surgery leave our hospital within 24 to 72 hours.
- **Chemotherapy** may be of benefit for certain tumor types, such as nephroblastoma and lymphoma. Generally, chemotherapy necessitates the use of a combination of potent drugs, and should be administered by individuals who have experience and expertise in treating these patients.
- **Radiation therapy** may be of benefit in certain metastatic tumors, such as renal carcinoma that has spread to bone.
- **Antibiotic therapy** is indicated in those patients with concurrent urinary tract infections.

Aftercare:

Optimal treatment for your pet requires a combination of home and professional veterinary care. Follow-up can be critical, especially if your pet does not rapidly improve.

- **Administer all prescribed medication** as directed. Alert your veterinarian if your pet is having any problems, such as respiratory difficulty or changes in urination.
- **General blood work**, including a complete blood count and biochemical profile, may need to be reevaluated as recommended by your veterinarian.
- **Abdominal ultrasound**, depending on the tumor type, should be followed every several months.
- **Thoracic radiographs** may be recommended on a regular basis to assess for metastatic disease.
- **Long-term prognosis** is poor for most of the malignant renal tumors.
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AFTERCARE & OUTCOME

Most uncomplicated kidney removal carry a fair prognosis if patient is free of malignant kidney cancer.

Many pets return to normal in most incidence in ~2 weeks & clinical signs usually resolved.

NOICTA: 3 days long lasting slow-release bupivacaine intra-OP surgery injection was given to help with local surgical incision.
Pain medications should be tailor to the lowest effective amount especially for the first 3 days then taper the dosage up as indicated.
Observe for vocalization, biting or licking at the surgical site, anxiety &/or lethargy.

A Primapore adhesive band aid was applied to the surgical site with antibiotic ointment to help prevent self-trauma & infection. Skin glue was applied to the edges to allow the Primapore to adhere to the skin for about 5-7 days. Allow the Primapore to fall off naturally unless it is dirty or soil or wet then please remove earlier; however, by forcing the adhesive off early it may cause skin irritation or inflammation.

E-Collar should always be on for a minimal of 14 days until the skin incision is completely healed.
The only time that the E-Collar may come off is during direct adult supervision otherwise please keep the E-Collar on to prevent self-trauma to the incision site & infection.

Activity restriction is recommended for minimal of 14 days until the skin incision is completely healed.
Absolutely no running, jumping, jogging, playing, or using stairs whatsoever.

Increase activity may increase the chances of post-operative incision complications such as seroma (fluid filled pocket at the incision site), increase incisional inflammation, incision wound opening, delayed incision site healing, suture reaction & abdomen (peritonitis) &/or wound infection, so nursing care & monitoring is the utmost importance.

Medications will be discussed with your primary veterinarian & staff.
Please make sure you Nunderstand what the medications are, how to give, how frequent to give & the potential side effects.

Diet options after this surgical procedure include regular diet unless prescription diet is needed for 1/4 amount of recommended diet the night of surgery is ok (~6 hours after surgery).
if your pet is willing to eat. It is important that we make sure to feed your pet to allow for proper nutrition. It is a good prognosis if your pet eats well & keep the food down without vomiting or diarrhea.

If possible 24-hour aftercare is always recommended in case if the recovery after surgery is not smooth or routine.
If 24-hour aftercare is NOT possible then make sure to know what signs to look for while your pet is in your care that you have map out the nearest location of a 24-hour veterinary ER hospital / clinic & their phone number.

If you have any questions, please feel free to ask your primary veterinarian &/or veterinary surgeon.

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