

# **Urologic Surgical Associates of Delaware**

## ***Specializing in Robotic Surgery***

### **Renal Masses and Kidney Cancer**

A renal tumor is a mass within the kidney that may be benign or cancerous. Often the malignant potential of a renal mass (i.e. its likelihood of being cancerous) can be very accurately determined with x-rays such as a CT scan or MRI. Classically, 95% of the time when a renal mass has the appearance of a renal cell carcinoma or cancer of the kidney on CT or MRI imaging the pathology on nephrectomy (surgical removal of the kidney) confirms that this is an accurate diagnosis. In other words CT scan and MRI imaging can be very predictive of the malignant potential of renal tumors. Primarily for this reason when a CT or MRI demonstrates a high likelihood of cancer in a renal mass radical nephrectomy or surgical removal of the entire kidney is often recommended based solely on the x-ray imaging. Typically, biopsies are not done of renal tumors because of concerns that the biopsy will fail to access the tumor and thereby give you a potentially false negative (the biopsy missed the cancer) result or that if the needle does access the tumor it may seed cancer along the needle track and spread the cancer outside the kidney. So the typical pathway is that based on x-ray imaging alone a radical nephrectomy is recommended. Other x-ray imaging for possible kidney cancers would include bone scans and chest x-rays and possibly a head CAT scan to rule out possible metastatic spread prior to surgical removal. The majority of renal tumors create no symptoms and no discomfort or pain. Therefore, the majority of renal masses and renal tumors and kidney cancers are identified serendipitously on x-rays obtained for other reasons.

Not all renal lesions are clearly malignant on CT scan or MRI. For example, cysts are lesions that commonly occur on the kidney and the majority of cysts are not malignant. A simple cyst is a cyst that has the appearance on an MRI and CT scan similar to that of a balloon filled with water. That is, a simple cyst has clear fluid on the inside and a very thin wall on the outside. A simple cyst is clearly benign and not cancerous and does not need further imaging. If the cyst is not a simple cyst it may need further imaging or follow-up imaging or even resection to clarify whether or not it has malignant potential. Any deviation from the description of a cyst as being thin-walled and filled only with clear fluid represents a complex cyst. Examples of a complex cyst would include a cyst that has walls or septations on the inside or the outer wall has thickness or calcification or the fluid has debris within the cyst. Any of these findings on a cyst would indicate a complex cyst that at a minimum may need follow-up imaging. If the cyst has significantly worrisome features such as thick walls with enhancement on CT scan then the cyst may be worrisome enough to merit exploration and removal or even radical nephrectomy.

Radical nephrectomy has been the gold standard for treatment of renal cell carcinoma or kidney cancers for decades. Radical nephrectomy in the past has been performed through a large incision on the side of the body called a flank incision. These incisions often

involve the removal of part of a rib and were very long and painful incisions transecting many muscle groups. Most radical nephrectomies can now be achieved through a laparoscopic nephrectomy technique using robotic assisted laparoscopy or hand-assisted laparoscopy. Laparoscopic techniques allow for the safe and effective removal of the kidney without having to make a flank incision. Hand assisted techniques generally include an incision long enough to squeeze one hand through the incision and that incision can be performed in a location, such as the midline, where no muscle needs to be transected. This greatly decreases postoperative pain and discomfort from radical nephrectomy. The midline is lying in the middle of the abdomen between the abdominal muscles. A 5 cm incision on or near the belly button or umbilicus allows for placement of one hand in the abdomen and several small ports can be placed through small holes the size of your pinky finger nail to allow instruments be placed into the abdomen for radical nephrectomy. This allows removal of the entire kidney through the hand incision. Robotic assisted laparoscopy is the use of a surgical robot to facilitate laparoscopic surgery without placing a hand into the abdomen. The kidney is removed through a small midline incision.

Generally with laparoscopic radical nephrectomy the patient will be in the hospital for two to five days. The risks of a laparoscopic radical nephrectomy include injury to adjacent organs such as the spleen or bowel or stomach or liver. Most of these adjacent organ injuries can be identified and corrected at the time of surgery. When identified at the time of surgery, these injuries can be dealt with in a fashion that usually results in no significant postoperative difficulties. Rarely, an injury to the spleen may necessitate removal of the spleen at the time of surgery. More problematic is when injuries to associated organs are not identified at the time of surgery. For instance, a bowel injury identified on postoperative day five rather than at the time of surgery may result in serious illness and return to the operating room to correct the problem. This difficulty in the postoperative period will greatly extend the hospital stay and slow the recovery of the patient. This postoperative difficulty is fortunately uncommon with radical nephrectomy. Another possible problem involved with radical nephrectomy is bleeding and there is a small risk of transfusion with any radical nephrectomy. Infection is always a possible difficulty with any surgery and wound infections can occur that require local treatment and/or antibiotics. If infections are severe it may require return to the operating room to repair the incision.

Most kidney cancers treated with radical nephrectomy will not need adjuvant therapy and will not recur. However, as with any cancer there is a risk of spread beyond the organ of origin and there is a risk of recurrence.

When kidney cancer has spread outside the organ of origin (i.e. the kidney resected) additional or adjuvant therapies are sometimes considered. Kidney cancer does not respond well to radiotherapy so this is often not used for these situations but chemotherapy and immunotherapy are often considered for advanced cases of kidney cancer. Various forms of chemotherapy can be considered for metastatic or advanced kidney cancer. The particular chemotherapeutic agents used and the risk of their usage and success rates is best discussed with an oncologist (a doctor who delivers

chemotherapy and immunotherapy). Immunotherapy is similar to chemotherapy and that it is delivered in intravenous and/or oral forms to treat advanced cancers. Immunotherapy has had a unique role in the treatment of advanced kidney cancers and can even be successful in treating very advanced cases. The risks and efficacy of immunotherapy is best discussed with an oncologist. In some cases a single metastatic lesion can be treated with surgical resection rather than immunotherapy or chemotherapy. For instance, if you have a kidney cancer and metastatic lesion to the liver or lung these metastatic lesions might be resected at the time of your nephrectomy or perhaps as a separate procedure. If there are multiple such lesions surgical resection of the metastatic lesion becomes less helpful.

Partial nephrectomy and percutaneous radiofrequency waves or cryotherapy ablation therapies can sometimes be used for renal tumors. These techniques all intend to treat a lesion in the kidney without having to remove the entire kidney. These are termed nephron sparing techniques in that part of the goal of such treatment is to spare as many nephrons (the working units of the kidney) as possible while resecting or treating the threatening lesion. These therapies must be considered with caution and applied to special circumstances. Partial nephrectomy involves resecting a part of the kidney containing the lesion while leaving the majority of the kidney in place. Partial nephrectomy can often be accomplished by laparoscopic technique but sometimes requires an open incision. Partial nephrectomy generally requires increased blood loss over a radical nephrectomy and so there are increased perioperative risks such as blood transfusion or myocardial events (such as a heart attack). Certain lesions may qualify for a partial nephrectomy if they are not too large and do not enter into particularly vital areas of the kidney such as the center of the kidney where the major blood vessels travel and the collecting system (where the urine begins to collect inside the kidney) begins. Classically, partial nephrectomy is reserved for lesions that would be easy to identify in the operating room because they occur on the surface, lesions that are less than 4 cm in diameter, and lesions that are in patients who already have compromised kidney function (such as patients with a solitary kidney or significant kidney disease). Robotic technology allows for partial nephrectomy for even complex tumors with minimal blood loss. Please see our patient briefs about robotic surgery @ [http://www.usadelaware.com/robotic\\_surgery.htm](http://www.usadelaware.com/robotic_surgery.htm)

Radiofrequency and cryoablation are techniques that are used to destroy renal lesions rather than resect renal lesions. These treatment modalities collect only a small amount of tissue for specimen for a pathologist to review to confirm the diagnosis. These techniques rely considerably on the accuracy of radiographic imaging both to establish initial diagnosis and to locate the lesion for treatment. These techniques can also be used on patients with compromised renal function or patients who cannot tolerate the risks of major surgery. Radiofrequency ablation and cryoablation can sometimes be accomplished without the use of general anesthesia and surgical exploration in the operating room. These treatment options do not have the same proven cure rate as surgical removal and so these treatments are usually reserved for patients who are at high risk for anesthesia.