Kidney Cancer

Kidney cancer affects about 23,000 Americans each year. The most common form of cancer arises in the tubules that filter blood in the kidney and is known as renal cell carcinoma (RCC). Typically, patients with RCC are over 40 years of age. Men are twice as likely to develop RCC as women.

Most patients with RCC do not develop symptoms until the tumor becomes very large. Symptoms at this point might include abdominal pain, fatigue, blood in the urine, or a mass that can be felt in the abdomen. However, with modern medical imaging technology, very small tumors are now being detected on ultrasound, CAT scan, and MRI examinations that are performed for some other reason. It is these small tumors that are less likely to have spread to lung and bone at the time of discovery. These smaller tumors tend to present the best treatment options, particularly if the tumor lies along the outside edge of the kidney.

RCC is notorious for poor response to traditional chemotherapy and radiation therapy options. Standard treatment for the tumor has involved complete removal of the kidney, known as radical nephrectomy, until relatively recently when surgeons have been able to demonstrate equal effectiveness with removal of the only the portion of the kidney containing the tumor, allowing sparing of the remainder of the kidney. Unfortunately, some patients will not be candidates for surgery, possibly because of other medical conditions which will not allow them to tolerate surgery. It is often these patients for whom interventional treatment has significant potential.

Radiofrequency Ablation

Radiofrequency ablation (RFA) has emerged as a new treatment for renal cell carcinoma in appropriate patients, possibly with less complication and less cost than traditional surgery. Some literature suggests outcomes similar to surgery for small tumors, although only early data is available at this time. During the procedure the ablation needle is advanced through the skin under ultrasound or CAT scan guidance and positioned in the tumor. An electric current is then applied to the needle to cause heating of the tumor around the needle, resulting in tumor death. The needle is then removed and a small bandage is placed. There are no sutures. Most patients are discharged the following morning.

While RFA has been shown to be very effective in smaller tumors, particularly along the outside edge of the kidney, larger tumors (greater than 4-5cm) and tumors deeper in the middle of the kidney may be much more difficult to completely treat. The presence of large blood vessels and urine in the collecting system in the middle of the kidney make it more difficult to achieve adequate heating of tissue and possibly increases the risk of complication.

Embolization

Embolization is another technique which can be helpful in treating renal tumor. The procedure can be used in conjunction with RFA. In the procedure a tiny catheter is advanced under x-ray guidance in to the artery at the top of one leg and then directed into the catheter to block blood flow to the tumor. When used with ablation, cell death is improved due to improved heating of the tumor tissue when blood flow to the tumor is decreased. Embolization can also be used in tandem with surgery. When a tumor is very large and there is concern about significant blood loss during surgical removal, the surgeon may request embolization prior to tumor removal. In this case the procedure is similar to embolization of smaller tumors, however the catheter is usually placed in a larger artery supplying a greater portion of or all of the kidney and alcohol is typically used to kill the tumor and the remainder of the kidney that is to be removed. Several studies have shown greatly reduced blood loss during surgery when embolization is used prior to surgical removal of appropriate tumors.

Embolization can also be used in the treatment of some benign non-cancerous tumors of the kidney. One tumor, angiomyolipoma, may have a tendency to bleed when it becomes large in size. Rather than remove the kidney, some patients will be treated with embolization of the benign tumor to stop bleeding, allowing preservation of the remainder of the kidney and its function.