



Eliminating Risks

Advances in Diagnosing and Treating Bladder Cancer

By Luis Rivera, MD

The American Cancer Society estimates that there will be approximately 63,000 new diagnoses of bladder cancer in the United States this year alone — 47,000 in men and 16,000 in women.

While the five-year survival rate of bladder cancer is 95% when tumors are still confined to the bladder, up to 25% of tumors are found after they are invasive or metastatic, lowering the survival rate significantly.

As with other types of cancer, delay in bladder cancer diagnosis and treatment can impact survival. So it is important for primary care physicians to be aware of the risk factors and refer any patients exhibiting bladder cancer symptoms to a urologist for additional testing.

Risk Factors

Research shows that the strongest risk factors for bladder cancer are smoking and exposure to second-hand smoke. According to the National Cancer Institute, cigarette smokers have a two to three times greater risk of developing bladder cancer than do nonsmokers.

Another risk factor for bladder cancer is age; 80% of bladder cancer incidences occur in individuals aged 60 years and older, and older men have a two to three times higher risk than women.

Occupation is a risk factor as well. Specifically, individuals working in the

petrochemical, metallurgy, and textile industries, as well as truck drivers, hairdressers, printers, machinists, dyers, and painters all have elevated risk for the disease.

Cyclophosphamide or arsenic treatment also elevates risk for bladder cancer, as does chronic bladder inflammation from recurrent urinary tract infections, a family history, or previous bouts of the disease.

Diagnosing Bladder Cancer

The most frequent presenting sign of bladder cancer patients is blood in the urine, hematuria, with no further symptoms. When a patient presents with hematuria, with or without other symptoms such as urinary pain or frequent urination, the primary care physician should take the patient's full medical history and perform several tests including a urinalysis and a urine culture, which will rule out a urinary tract infection. When performing these tests, it is important for the physician to conduct the urine culture before prescribing antibiotics. With the exception of young female patients with proven urinary tract infections, all individuals with gross or microscopic hematuria should always be referred for a full urologic evaluation.

During the initial evaluation, the urologist will perform a physical exam of the abdomen and pelvis. He will also examine the patient's kidneys using a CT scan or intravenous pyelogram (IVP) protocol, in which dyes that show the movement of fluids through the urinary system are injected into the patients' body. Finally, he will perform a cystoscopy or an examination of the bladder using a flexible or rigid cystoscope (an instrument equipped with a light and lens on the end that is passed through the urethra into the bladder). This examination is completed in the urologist's office while the patient is under local anesthesia.

If, during the cystoscopy, the urologist sees a tumor, he will recommend a biopsy. Knowing that a cystoscopy can miss as many as 20% of bladder cancers, the urologist will likely recommend further testing for patients in whom no other problems could be found and no tumor was seen. These additional tests might include renal ultrasounds, magnetic resonance urography, computed tomography urograms, and bone scans.

Most recently, physicians have turned to molecular tests, which can detect unseen cancers with 97% specificity.

One such molecular test is the fluorescence in situ hybridization test (FISH) that is used to identify chromosomal abnormalities — hallmarks of cancer.

Others include the BTA Stat, which identifies proteins in cancer cells, and the NMP22 BladderChek, which measures the level of the NMP22 protein in the bladder cancer cell nuclei.

Treatments

Treatment for bladder cancer depends on its stage and grade. If the cancer is in an early stage (superficial), growing slowly (low grade), and papillary, it may be removed by transurethral resection (TUR), a minimally invasive procedure performed via the urethra with a scope equipped with a special tool on the end. The recurrence rate for bladder cancer is relatively high, so patients who undergo TUR are examined at regular intervals to assess if the disease has returned. Thankfully, in most cases of reoccurring cancer, the disease usually recurs as a low-grade tumor, and the urologist may perform another TUR.

Patients with superficial tumors that are high-grade, occur in more than one area, have a component of carcinoma in situ, are flat against the bladder wall, or come back after treatment typically receive intravesical immunotherapy with Bacillus Calmette-Guerin (BCG) once a week for six weeks to reduce recurrence, disease progression, and mortality. BCG, which is comprised of weakened bacteria, works by activating immune cells, including natural killer cells, T lymphocytes, and macrophages in the bladder to kill cancer cells. Other immunotherapies, including interferons, are undergoing testing. Additionally, intravesical immunotherapy may also be done after TUR to help keep the cancer from reoccurring. This type of treatment involves the urologist placing mitomycin C as a liquid solution into the patient's bladder via a catheter. The patient then

holds the solution in the bladder for two hours before excreting it.

Radiation therapy is another way of treating bladder cancer. It may be used alone or in conjunction with chemotherapy. This form of treatment works by using beams of energy to destroy the cancer cells. When the cancer cells die, healthy cells take their place. Radiation is used more often in Europe than in the United States, where it is mainly used in patients who are poor candidates for radical cystectomy or the removal of the bladder.

Research shows that the strongest risk factors for bladder cancer are smoking and exposure to second-hand smoke.

When bladder cancer is high-grade and high-stage, physicians may suggest a radical cystectomy, or the surgical removal of the entire bladder and surrounding lymph nodes. In men, the prostate and seminal vesicles are also removed to increase the chance for cure. In women, the ovaries, fallopian tubes, uterus, and part of the vagina may be removed.

If the cancer has spread outside of the organ, physicians usually recommend the patient undergo chemotherapy in addition to the cystectomy.

Regardless of whether chemotherapy is used with the cystectomy or not, another way to store urine— either internally or externally — is needed. Surgeons create this new urine path in one of three ways.

If external collection is recommended, the surgeon will remove a piece of the

small intestine and use it to create a tube to carry urine to a stoma. A lightweight, leak-proof bag is placed outside the body at the stoma site to collect urine. This bag is then emptied regularly.

Newer forms of urine collection called continent urinary diversions store the urine internally and obviate the need for an external urinary appliance. But these methods require much longer surgical operations.

One of the internal collection procedures, known as the Indiana pouch, requires forming a piece of intestine into a pouch that can store urine. The urine does not leak because valves are created at two sites — at the abdominal wall for continence and where the ureters are implanted to prevent the reflux of urine back into the kidneys. To empty the pouch the patient catheterizes at regular intervals.

The second type of internal diversion is called an ileal bladder. With this method of continent diversion, a piece of intestine is formed into a new bladder. The new bladder is then attached to the urethra, allowing urine to follow the usual path out of the body. With this bladder, normal urination may then be possible most of the time, although the patient may have to catheterize occasionally and may sometimes experience leakage at night.

Not all patients are eligible for continent diversion. Excellent kidney and liver function are necessary for this procedure. Patients are increasingly accepting and adapting to neobladder and continent diversion, and the satisfaction rate with both procedures are, interestingly enough, about equal. 🏠

Luis Rivera, MD, received his medical degree from the University of Puerto Rico and completed his surgical and urologic residencies at Walter Reed Army Medical Center in Washington, D.C. Following his military service, Dr. Rivera joined Urology San Antonio and has been practicing with the group for more than 20 years.