

Urologic Surgical Associates of Delaware

Specializing in Robotic Surgery

Hematuria, Bladder Cancer, and Transurethral Resection of Bladder Tumor (TURBT)

Bladder cancer has a decreasing rate of new diagnosis in the United States over the past two decades. It is still a relatively common cancer with a high occurrence rate because even though the incidence of new diagnosis of bladder cancer is on the decline it tends to recur. Because bladder cancer tends to recur often it has a high rate of occurrence even with a decreasing rate of new diagnosis. Most bladder cancers are called transitional cell cancer. Transitional cells are the cells that line the bladder and the ureter (the tube that carries the urine from the kidney to the bladder). Transitional cells also line the inside of the kidney or the renal pelvis. All of these areas move and store urine created by the kidneys. Because these areas are designed to store and move urine these areas (the renal pelvis, the ureter, and the bladder) must be able to fill and then empty. The lining of these areas is called transitional epithelium and it is specialized to be able to change shape to fill and then empty. Therefore, cancers of the inside lining of any of these areas tend to be transitional cell carcinoma. Approximately 95% of new bladder cancer diagnosis occurs in the bladder while a minority of transitional cell cancer diagnosis occur in the ureter or kidney (renal pelvis).

Risk factors for bladder cancer include cigarette smoking, exposure to anniline dyes (used in rubber and textile industries), exposure to cyclophosphamide chemotherapeutic agents, prior radiation to the pelvis, and family history. Increasing age also increases risk for bladder cancer. The most significant of these risks is cigarette smoking. Quitting cigarette smoking is the best way to decrease your risk of a new diagnosis of bladder cancer and if you have a diagnosis of bladder cancer then quitting cigarette smoking is the best way to decrease your risk of recurrence of bladder cancer or progression to more aggressive disease. Approximately 70% of new bladder cancer diagnosis occurs in smokers. Screening for bladder cancer involves a history and physical and urinalysis. If too many red blood cells are identified on urinalysis then x-ray imaging of the kidneys and ureters (often called the upper tracts) along with endoscopic evaluation of the bladder (called cystoscopy) are required to rule out the possibility of cancer in the kidney, ureter, or bladder. Finding too many red blood cells on the urinalysis is called microhematuria. If you have microhematuria then your risk of finding cancer on these studies is approximately 1% or less. This risk goes up if you have any of the risk factors mentioned above. Gross hematuria is blood in the urine that occurs to such a degree that it is visible to the individual while urinating. Gross blood in the urine, especially if it occurs in the absence of pain or urinary tract infection symptoms is far more worrisome for bladder cancer than is microhematuria. In an elderly male smoker with gross hematuria that is painless the chance of finding bladder cancer is approximately 20-25%.

If bladder cancer is diagnosed it generally requires biopsy to confirm the pathology and to help stage the extent of the cancer. In the bladder this type of information is collected by performing a transurethral resection of bladder tumor (TURBT). TURBT is performed in the operating room with endoscopic or telescopic instruments that can pass

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through the urethra into the bladder to scrape out all visible bladder tumors. When scraping out this tumor with TURBT it is important to collect enough information to decide whether the tumor has invaded the bladder wall to a dangerous level. The bladder wall is made of a deep muscle and connective tissue layer and on top of this deep muscle and connective tissue layer is a superficial layer including the transitional cell lining and some superficial muscle tissue. Separating these layers is an area called the lamina propria. The lamina propria divides the superficial from the deep tissues. For accurate staging information the resection must be carried out deep enough to take some lamina propria tissue and some of the deep connective tissue with deep muscle tissue. A useful analogy might be to compare this resection with attempting to scrap some of the flooring from a second-floor room with a carpet. The carpet layer could represent the superficial tissue of the bladder with the padding under the carpeting representing the lamina propria and the plywood subflooring representing the deep tissues of the bladder wall.

To continue the analogy, when performing a TURBT resection it is important to take scrapings that are deep enough to scrape some of the carpet and the carpet liner and the plywood subflooring but it is important not to scrape so much tissue that you go all the way through the floor so that you can see the room below you. This is a delicate balance between taking enough tissue to make a firm assessment and diagnosis but not taking so much tissue that you create a hole in the bladder. When such a hole is created on TURBT it is called a perforation. Bladder perforation on TURBT can have serious consequences. If it is created in an area that connects directly into the abdomen (the peritoneal cavity) where the loops of bowel reside (this is generally at the very back wall and very top of the bladder) then immediate surgical exploration with an incision through the abdomen is usually required. Such a perforation, if untreated, can result in serious illness and even death. Such a perforation can also lead to spread of the bladder cancer. If a perforation of this nature occurs elsewhere in the bladder (such as along the side walls or anterior section or base of the bladder) then the consequences are far less serious. Such perforations that do not connect into the peritoneal cavity can be managed with simply keeping a bladder catheter in place for longer periods of time (such as five to ten days).

If a TURBT is uncomplicated and does not involve perforation the bladder catheter may be kept in place for two to seven days. The TURBT is performed usually on an outpatient basis under anesthesia in the operating room. Therefore, patients commonly go home the same day of surgery with a catheter in the bladder and return to the office in two to seven days to have the catheter removed. It usually takes about one week to have the pathology report on the nature and the extent of the cancer.

Approximately 70 to 80% of new bladder cancer diagnosis is superficial disease. Superficial disease is bladder cancer that extends only into the superficial tissues and not into the lamina propria (the layer of tissue that separates the superficial from the deep tissues of the bladder wall). Approximately 20% of new bladder cancer diagnosis involves invasive cancer. Invasive cancer is a far more serious and threatening cancer than superficial cancer. Superficial cancer, unto itself, does not present an immediate threat to your life other than it can cause bleeding. However, superficial disease can become invasive cancer of the bladder. Invasive cancer is highly dangerous. It spreads rapidly in some cases. Fortunately, most new bladder cancer diagnosis is superficial

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disease. Approximately 40% of superficial disease will progress to invasive cancer. A new diagnosis of superficial disease should be evaluated with a metastatic survey such as a bone scan, a CT scan, and chest x-ray along with the initial TURBT. The hallmarks of managing superficial disease are follow-up surveillance cystoscopy and efforts to minimize the chance of superficial disease progressing into invasive cancer and to catch any recurrence as early as possible.

Managing superficial disease involves surveillance cystoscopy usually in the office every three months for two years followed by every six months for two years followed by once a year for life. Generally, upper tract imaging must be repeated periodically during the surveillance effort. If a new bladder tumor is identified then the tumor is resected with TURBT in the operating room and the surveillance clock is set back to time zero. That is, surveillance cystoscopy must now again be done at every three months for two years followed by every six months for two years followed by once a year for life. If superficial cancer has worrisome features such as a high malignancy grade as deemed by the pathologist or it occurs in multiple sites or it occurs in large volume or it recurs very frequently then intravesical immunotherapy should be considered. Intravesical therapy involves placing a catheter in the bladder in the office to instill an agent that has been proven to stimulate the immune system and reduce your risk of recurrence of bladder cancer as well as your progression of bladder cancer. Many agents have been developed which can be instilled into the bladder to achieve this goal. The first line of therapy is usually BCG. BCG therapy is an attenuated tuberculosis bacterium that has been shown to stimulate the immune system of the bladder and decrease the recurrence and the progression of bladder cancer. BCG therapy can be extremely helpful in managing bladder cancer. It is generally instilled once a week for six weeks and then a repeat cystoscopy is performed perhaps with biopsies. The BCG can cause fevers, pain with urination, malaise and decreased appetite, fatigue, and urinary tract infections. These symptoms should be reported when they occur and if these symptoms occur you may not be able to use BCG to manage your bladder cancer. BCG can also cause granuloma formation in the lungs or other organs similar to a tuberculosis infection. In such cases patients may need to be treated for tuberculosis. There are other agents that can be considered if BCG can no longer be used and these include some traditional chemotherapeutic agents.

Invasive cancer can be highly dangerous and needs to be treated aggressively. A new diagnosis of invasive bladder cancer requires a metastatic survey with a CT scan, LFT blood studies, and chest x-ray. If the bladder cancer appears to be confined to the bladder then the standard treatment for invasive bladder cancer is a radical cystectomy. Radical cystectomy is a major operation with significant risk of blood loss and blood transfusion as well as significant risk of heart attack, stroke, and pulmonary embolism. Radical cystectomy also requires a reconstruction of the remaining urinary tract (the upper tracts) so that the urine can drain out of the body in the absence of the bladder. This urinary reconstruction usually involves creating an ileal diversion which is using a piece of small bowel to create a loop that drains urine to a bag on the abdomen. Small bowel could, alternatively, be used to reconstruct a new bladder for certain patients. If you are a candidate for this "neobladder" using bowel and you are interested in such a diversion and you require radical cystectomy, then you would need to be able to catheterize your own bladder as part of your own post-operative care. Radical cystectomy involves

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complete removal of the bladder and prostate in the male and in the female radical cystectomy involves complete removal of the bladder, the female pelvic organs, and part of the vagina. Traditionally, this was performed as an open abdominal surgical procedure but now can be done via a robotically-assisted laparoscopic technique. This allows the procedure to be completed through several small incisions rather than 1 large incision. Recovery from the laparoscopic procedure is easier for most patients; however, this is still a major procedure with significant risks. There is usually a seven to ten day stay in the hospital if there are no major untoward events during the postoperative recovery. Patients commonly experience some small or even major setback during the recovery period of a radical cystectomy. Such a setback might include any of the serious consequences mentioned above or a delay in the healing process to slow the recovery of bowel function or a wound infection or a ureteral stricture (a narrowing of the ureter where it connects to the ileal diversion), pneumonia or some other type of difficulty that delays the recovery process. For further details please see our brochures on Robotic Cystectomy and Robotic Urinary Deversion and Ileal Loop Urostomy.

Invasive bladder cancer patients should consider chemotherapy before their surgery (Neoadjuvant chemotherapy). Having chemotherapy pre-operatively has been shown to decrease the chance of metastatic spread from invasive bladder cancer and may improve your chance of survival from this dangerous cancer. Neoadjuvant chemotherapy generally requires three months to complete and another month of recovery (a total of 4 months) before proceeding to radical cystectomy.

If invasive bladder cancer has spread beyond the bladder chemotherapy and possible radiotherapy may be used as additional therapy. In some cases radiotherapy and chemotherapy and TURBT can be used (without radical cystectomy) to manage invasive bladder cancer. This management option is called bladder salvage therapy and is usually considered suboptimal therapy in comparison to radical cystectomy. Bladder salvage therapy is often considered for patients who have invasive bladder cancer but are also high risk surgical patients.

Some cancers invade the lamina propria but do not clearly invade the deeper muscle and connective tissue. These lesions are called T1. T1 lesions are controversial in their management. Most T1 lesions are managed by BCG intravesical therapy as described above but some patients might opt to treat a T1 lesion with radical cystectomy. The rationale for such aggressive treatment of a T1 lesion is based on the possibility that a T1 lesion might actually be an invasive cancer. Studies of patients who have had a T1 lesion who went on to have radical cystectomy showed that their surgical pathology showed invasive cancer 20-25% of the time. So patients with a T1 lesion are at risk for having an invasive cancer or developing an invasive cancer and so they could consider radical cystectomy for treatment. Choosing between radical cystectomy versus BCG intravesical therapy for T1 bladder cancer is a very difficult decision for patients and should be discussed thoroughly with your urologist.

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