

## **BLADDER CANCER AND BCG BACKGROUND AND DISCUSSION**

(BCG is Bacillus Calmette Guerin)

### **Introduction**

The bladder is the most common site for cancer to develop in the urinary system, and the incidence of bladder cancer is rising. In the United States, it is the fifth most common form of cancer in men and the tenth most common in women. Some 50,000 new cases will be diagnosed this year, three out of four of them in men. Although about 10,000 deaths are attributed to bladder cancer each year, most of these are patients with advanced disease. The five-year survival rate of patients whose bladder cancer has been detected early is quite high, almost 90 percent.

Bladder cancers are classified into two main categories, superficial (basically involving only the bladder lining) and invasive (spreading into the muscular layer and beyond). The deeper a cancer grows into the bladder wall, the more difficult it is to treat effectively. About 70 percent of newly diagnosed cases are classified as superficial tumors. The remaining 30 percent of bladder cancers have penetrated further into the bladder wall and may involve other organs.

Patients with early bladder cancer are usually treated by removing the cancer or cancers with a telescopic knife, a procedure that is called transurethral resection of bladder tumor or TURBT.

Even if the cancer is removed completely with this technique, a significant chance of recurrence of the cancer exists. This recurrence usually happens within two years, but may occur 5 or even 10 years later. Many times the recurrence of the cancer may be more aggressive and more invasive. About 70% of patients with an initial bladder cancer will have a recurrence.

### **Who is at risk for recurrence of bladder cancer?**

Patients at most risk are those who have:

- multiple tumors simultaneously in different parts of the bladder
- tumors which microscopically demonstrate aggressive behaviour or chromosome abnormalities
- a history of previous tumors
- exposure to cancer causing substances (particularly smoking)
- a condition called carcinoma in situ (CIS).

### **What is CIS?**

Carcinoma in situ or CIS is a form of superficial bladder cancer in which the malignant, or cancerous, cells are limited to the bladder lining. CIS is present in 20 to 30 percent of bladder cancer cases and may be diffuse - occurring in several areas along the bladder lining. Telescopically, the bladder may appear normal or perhaps slightly reddened. However, biopsies of these areas show malignant cells. Malignant cells may even be seen in urine specimens that are viewed with special stains (cytology). The significance of CIS is that recurrence of cancer almost always occurs within 24 months and often returns as a more aggressive and invasive cancer that is not easily treated. In such cases, surgery may be required, and occasionally the entire bladder must be removed.

### **How do we treat patients at high risk for recurrence?**

Patients who are at high risk for recurrence are often recommended to have special medications instilled into the bladder, a treatment called 'intravesical chemotherapy' (intravesical means 'in the bladder' and chemotherapy simply mean 'treatment with chemicals').

There are many different types of medication used for intravesical chemotherapy and some of the treatment regimens date back 50 years. Some of the current medications are identical to those used for

other types of cancer, but when given 'intravesically', the side effects are usually mild and relate only to the bladder. Some of the currently used drugs include Thiotepa, Mitomycin-C, and Adriamycin.

More recently, medications have been used which are unlike other types of chemotherapy. These newer drugs act by stimulating the body's immune system, hence the term 'immunotherapy'. These drugs act to stimulate the body's own defense mechanism by creating inflammation in the bladder wall. The inflammation causes white blood cells to attack the diseased bladder lining and this may reduce the risk that cancer will return to the areas treated. The most common side effect of 'intravesical chemotherapy' is bladder irritation, which results from inflammation of all the bladder lining at the same time, healthy and unhealthy. The most successful of these drugs is BCG. Other drugs, still experimental, include interferon and interleukin and special treatments using ultraviolet light.

### **What is BCG?**

BCG is a strain of Bacillus Calmette Guerin vaccine, a live but weakened bacterial preparation (*Mycobacterium bovis* is its official name). This medication was originally developed as a vaccine for tuberculosis at the beginning of the 20th century. Subsequently, BCG was found to be successful in treating certain bladder cancers when the BCG was instilled into the bladder.

### **How is BCG used?**

The BCG is provided to the physician in a small vial. It is diluted with water to a volume of 50 ccs or a little less than two ounces.

### **Patient Preparation**

Before we start BCG you will need to have a battery of blood tests including blood counts and liver function tests, if these have not been done in the past three months.

Do not drink fluids for at least four (4) hours before you receive your treatment.

Some patients are given medications to reduce symptoms of bladder irritation but not all patients require these medications. Take any special medications that might be prescribed about one hour before the treatment. These may include drugs to reduce burning (usually Pyridium or phenazopyridine), reduce urgency of urination (Ditropan, Levsinex) or an antibiotic.

Before your instillation, inform your doctor if you have felt feverish, tired or had chills or if you have seen any blood in your urine since your last treatment.

Leave a urine specimen with then nurse just before the installation.

### **REASONS NOT TO USE BCG**

- Patients who have difficulty handling infections (HIV, AIDS, Steroid use)
- Active urinary tract infection
- Active Tuberculosis
- Bladder cancers which have invaded the bladder muscle
- Inadequate bladder capacity to hold urine for at least 60 minutes
- Cautionary situations include: heart valve patients, need to use antibiotics or blood thinning medications for other diseases prior to treatments

### **THE PROCEDURE**

A catheter or small rubber tube is passed through the urethra into the bladder and all of the urine in the bladder is allowed to drain out. The BCG is then instilled into the bladder slowly and the catheter is removed.

The BCG should be retained in the bladder for two hours if possible to obtain the best results. Some patients may not be able to hold their urine for two hours. If the time to urination is shorter, the treatment is usually effective, but we do not have sufficient data to know that for sure. The BCG should not be retained for more than two hours. Let us know at your next visit how long you held the BCG.

You should remain active afterwards to move the medicine around in the bladder. If you want to lie down then you should plan to move positions from side to side and back and front every 15 minutes while the medication is in your bladder.

### **AFTER INSTILLATION OF BCG**

After retaining the medication in your bladder for two (2) hours (hopefully), it must be disposed of carefully. The BCG is a live bacteria and you must try to destroy the bacteria before releasing it into the water drainage systems.

- >Sit down on the toilet to urinate and fully empty your bladder.
- >After urinating, pour two (2) cups of household bleach (Clorox or equivalent) into the toilet.
- >Let the medication and Clorox mixture stay in the toilet for 15-20 minutes before flushing.
- >For six (6) hours after each treatment, repeat the above process each time you urinate.
- >Wash your hands and genital areas thoroughly after you urinate.
- >Drink plenty of fluids after your instillation to flush your bladder.

### **UNTIL YOUR NEXT INSTILLATION**

You may experience some burning and frequency of urination with the first few voidings after your treatment. If this occurs, you need to increase your fluid intake.

### **THE MORE COMMON AND REVERSIBLE SIDE EFFECTS OF BCG**

1. Transient fever;
2. Flu-like symptoms;
3. Abdominal lymph node swelling may be noted frequently;
4. Bladder inflammation which could cause your bladder to hold less urine;
5. Frequent urination with discomfort if inflammation occurs;
6. Possible increased sensitivity to certain antibiotics.

### **Call us at the above telephone number if you experience:**

- Continuous pain or burning on urination
- Bright red blood or blood clots in the urine.
- Fever or chills or malaise (generalized feeling of discomfort or illness).
- Flu-like symptoms, joint pain, prolonged coughing, skin rash.

You should expect urgency, increased frequency of urination, and possible burning with urination. The symptoms usually become worse with consecutive treatments but may be tolerable throughout. If the symptoms are intolerable give us a call and we will try to treat the side effects. Call us if severe urgency of urination with incontinence (involuntary loss of urine) or severe frequency or severe burning does not respond to medication.

### **HOW OFTEN WILL THE BCG BE INSTILLED?**

The usual course of treatment is once a week for six (6) weeks followed by a six week rest period. At 12 weeks, a telescopic examination of the bladder (or cystoscopy) will be done to see if the cancer has returned. If not, an additional three weeks of treatments will be started. Patients will be seen every three months for a cystoscopy and every six months, an additional three weeks of treatments will be given. The

treatments will continue for two years. Follow-up cystoscopy will be required at intervals for at least ten years after the occurrence of a bladder tumor.

Many physician have different protocols for BCG. Some give more, some give less. The above regimen has been successful in our hands with minimal side effects or reactions. Patients that have not recovered from the symptoms of a prior treatment will usually not be treated until those symptoms have subsided.

#### **WHAT ARE THE MORE SERIOUS AND REVERSIBLE SIDE EFFECTS OF BCG**

1. Uncommon allergic reaction ranging from skin rashes of several types; wheezing with shortness of breath; drop in blood pressure and possible loss of consciousness.
2. Widespread BCG infection with fever, night sweats, cough and liver involvement has been rarely reported.
3. Possible local infections which may involve the liver, lungs, prostate, bladder and kidneys.

#### **WHAT ARE THE MORE SERIOUS AND IRREVERSIBLE SIDE EFFECTS OF BCG**

Life-threatening and fatal systemic infections have been reported and antibiotic treatment may be necessary.

Although this drug has been tested, there is the possibility of other side effects occurring which have not been seen previously.

**DO NOT HESITATE TO CONTACT YOUR PHYSICIANS AND THEIR MEDICAL STAFF IF YOU ARE CONCERNED ABOUT ANY UNUSUAL OR SEVERE REACTIONS.**