

THE UROLOGY GROUP

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PROSTATE CANCER

General Overview

Prostate cancer is the most common type of cancer in adult men. The prostate is a gland which is part of the reproductive system. It makes a portion of the semen, which is the fluid that comes out at the time of ejaculation. The prostate forms the first part of the urethra which is the urinary channel that drains urine from the bladder to the outside through the penis. The prostate begins to enlarge in a benign or non-cancerous fashion in almost all men beginning at the age of 40. As it does, it can occlude the urethra and cause a change in the pattern of urination. While normal growth of the prostate affects most men, approximately 1 out of 10 men will develop cancer of the prostate.

Every man should have an annual exam for prostate cancer with a combination of digital rectal exam and a PSA blood test. A digital rectal exam is carried out when a physician inserts a gloved finger into the rectal area to feel the surface of the prostate to determine if there is any area of nodule formation or irregularity. The PSA level is checked by a blood test. PSA stands for prostate specific antigen which is a protein made only in the prostate and not anywhere else in the body. If PSA is elevated it may be a sign of prostate cancer. Other conditions can cause elevation of the PSA such as the normal enlargement of the prostate or inflammation of the prostate.

If there is an abnormality on either digital rectal exam or PSA, a prostate ultrasound with biopsy can determine if prostate cancer is present. When prostate cancer is identified by biopsy, the next step is to determine its potential clinical behavior by analyzing risk factors, which include stage, grade and volume of disease.

The extent of the cancer is referred to as the stage of disease. Stage T1 refers to disease which is identified on the basis of an elevated PSA without an abnormality on rectal exam. Stage T2 refers to cancer that can be felt on the digital rectal examination. Both Stage T1 and T2 are referred to as organ confined prostate cancer. Stage T3-4 disease includes those cancers that have spread beyond the edges of the prostate. This determination is often made at the time of the rectal exam or the ultrasound examination. Prostate cancer may also spread to other sites beyond the prostate, which can include the lymph nodes, the bones and the lungs. These areas can be checked with a CT scan of the pelvis, a bone scan and a chest x-ray. If there are abnormal areas on the bone scan, follow-up x-rays and evaluation may be needed.

The appearance of prostate cancer under the microscope is known as the grade and is characterized using the Gleason system. There are different types of patterns that are rated using the Gleason grading system. The patterns are assigned a grade that runs from 1 to 5. When prostate cancer is present, there may be several different patterns present. The Gleason score (a scale from 2 to 10) presents the sum of the two most common patterns (grades) present. Most Gleason scores range from 6 to 10.

The volume of disease refers to how many cores or biopsy samples are positive for cancer and the percentage of each sample that contains cancer.

Patients can be stratified into different risk groups, based on stage, grade and volume of disease, in an effort to predict their outcome and to assess their suitability for different types of treatment. Treatment of prostate cancer depends on the extent of disease and the age and overall health of the patient. Treatment options available for organ confined prostate cancer (Stage T1 and T2) include observation alone, radiation therapy and radical prostatectomy. In some places in this country, cryosurgery is also used to treat organ confined prostate cancer. Although publicized heavily, this technique is still in the investigational stages. It is currently not the standard of care and it is recommended that it only be carried out as part of an investigational protocol under the auspices of a university setting.

The rationale for observation alone (also known as "wait and watch" or expectant management) as a treatment choice is the recognition that some men may die of other illnesses before they die of their prostate cancer. One of the difficulties encountered in treating prostate cancer is trying to predict its biological potential. In the older man with other health troubles, and a type of cancer that does not appear particularly aggressive, it may be appropriate to choose observation. In the younger man, this is not the favorable choice since it can be anticipated that the cancer will spread outside the prostate in 60 to 70% of men within 10 years after diagnosis. For those men in whom the cancer spreads outside the prostate, they may subsequently die secondary to complications from the prostate cancer.

Radiation therapy involves the application of x-ray treatment to the prostate in an effort to eradicate the cancerous cells or at least arrest their growth. Radiation can be delivered in two different forms: external beam radiotherapy or brachytherapy (the insertion of radioactive seeds into the prostate). External radiation is typically given over a course of approximately 40 treatments. It is usually given five days a week for a six- to eight-week treatment total. External radiation therapy has very effective treatment results for men in the right risk group. Radiation is a good choice for men in their 70's without other significant health troubles. It may at times be appropriate for men in their 60's who have other health troubles or who have a type of cancer with low biologic potential. Complications of radiation can include damage to the urinary bladder or the rectum. This can result in urinary frequency and urgency. It can also cause diarrhea and rectal pain. Incontinence, which is the loss of urinary control, develops in less than 1% of men. Impotence, the inability to get an erection, may develop on a delayed basis over 1/2 of patients. If cancer remains in the prostate after radiation, a later attempt to remove the prostate through surgery is not a favorable option.

Brachytherapy is the term used to describe the insertion of radioactive seeds into the prostate. The rationale for inserting seeds directly into the prostate is that it allows a higher dose of radiation to be delivered to the prostate with less of an effect on adjacent organs. When this technique was first developed years ago, the main problem encountered was achieving an even distribution of the seeds. With the development of transrectal ultrasound it became possible to distribute the seeds in an even fashion. Long-term studies indicate that brachytherapy is at least as effective as external radiation therapy and may be as effective as radical prostatectomy for men in certain risk groups. Seed placement is now done on an outpatient basis under anesthesia. Impotence may develop in men but incontinence rarely develops in patients treated with seeds.

Radical prostatectomy refers to the surgical removal of the prostate. Surgery is carried out through either an open or laparoscopic approach. At surgery, the first step is the removal of the lymph nodes to determine if there are microscopic areas of cancer spread. After lymph node removal, the prostate and the attached seminal vesicles, which are accessory glands of prostate, are removed. The bladder is then rejoined to the urethra. Surgery typically involves a one- to two-day hospital stay. A catheter, which is a tube to drain urine out of the bladder, is in place for 7-14 days. Potential complications related to the surgery itself include bleeding and infection. There are also the general risks of an operation, such as a blood clot in the legs, heart irregularly, pneumonia, and so forth. Long-term potential problems include incontinence and impotence. Impotence develops in at least half of the patients even with application of the "nerve sparing" techniques. Surgery has the advantage over radiation of having better long-term

outcomes in terms of survival and disease-free survival at the 10- and 15- year mark in certain risk groups.

On some occasions, men who are treated with radical prostatectomy can require additional therapy once they recover from surgery. If there are microscopic areas of lymph node involvement, hormonal therapy may be required (see below). IF there is evidence of extension of the cancer up to the margins of the surgical resection, radiation may be added as follow-up treatment.

For men with Stage T3-4 disease, treatment options include radiation and hormonal therapy. Radiation therapy may provide control of local symptoms that would otherwise develop due to the size of the cancer as it encroaches on the urethra and bladder.

For those with disease that has spread to other sites, the primary treatment is hormonal therapy. Prostate cancer depends on testosterone, the male hormone, to grow and flourish. There are different ways to remove testosterone. These all fall under the collective term "hormonal therapy". Historically, the simplest way to remove testosterone was with orchiectomy. Orchiectomy refers to the surgical removal of the testicles, the site where testosterone is produced. Currently, hormonal therapy is done with a medication given by injection every four months which keeps the testicles from making testosterone. This type of medicine is known as a GNRH analog. Lupron and Zolodex are the most commonly used. Sometimes, in combination with either orchiectomy or a GNRH analog, an antiandrogen is used as well. Currently, the antiandrogens used are Flutamide (Eulexin) or Casodex, which are taken as tablets on a daily basis. This interferes with the small amount of testosterone may by the adrenal gland. Side effects of hormonal therapy include impotence in all men and hot flashes in some men.

The topic of prostate cancer can be very confusing for patients. Invariably, each patient knows other men who are being treated for prostate cancer. It is difficult to understand why one treatment is used in one man and a different treatment is used in another. Again, much of the treatment choice depends on the patient's age and overall health. In general, men do well with prostate, provided it is diagnosed early and treated appropriately.