



Prostate Cancer

What is Cancer?

Cancer occurs when cells multiply out of control, rather like a factory with the production line switch jammed on. The cells do not know when to stop multiplying and as a result grow into other tissues and spread to other parts of the body. In the case of prostate cancer it is usually fuelled by the male hormone, testosterone and in fact for treatment for some prostate cancers the lowering of testosterone is the corner stone.

Causes of Prostate Cancer

Prostate cancer tends to run in families and if a man's father has or has had a prostate cancer the likelihood of getting it can be increased by one and a half to two and a half times. The absolute risk is 12-20%. For two affected male relatives absolute risk is approximately 30%, three or more affected males relatives 35-45%. As men get older the risk of prostate cancer increases but it is possible that the risk of dying from prostate cancer may decrease. It is possible that men may therefore die of other causes, such as old age, heart disease, etc. There is no absolutely definite association with any particular type of diet and studies linking vasectomy with an increased risk of prostate cancer have not been confirmed. A man with Prostate Cancer who has intercourse will not "stir up" the cancer causing it to spread and will not pass it on to a partner.

Treatment

The object of treatment of prostate cancer or any any other condition for that matter is such that the treatment should enable the patient to live longer and better than otherwise the patient would do without the treatment.

The treatments, which would be discussed for prostate cancer will depend on the following factors:

- Grade of cancer
- Stage of cancer
- Patient's age
- Patient's general state of health, other medical conditions
- Patient's fears, anxieties and preferences

Localised Prostate Cancer

In cases of localised prostate cancer in which it is likely that a patient will have an improvement in his quality and length of life span, the treatment options are:

- 1 Observation.
- 2 Surgery (Radical Prostatectomy)
- 3 .Radiotherapy
- 4 External Beam
- 5 Brachytherapy
- 6 Combination
- 7 H.I.F.U. (High Intensity Focused Ultrasound-Heating of the prostate)
- 8 Cryotherapy (Freezing of the prostate)

Diagnosis of Prostate Cancer

When a man visits his doctor, the doctor will ask questions about symptoms which have led the patient to present. This is called a history. In some cases there may be no symptoms at all associated with prostate cancer and screening may be carried out in some men by the performance of a blood test which estimates the level of Prostate Specific Antigen, (PSA) in the blood stream.

PSA and testing for Prostate Cancer

PSA is a blood test, which measures the level of a substance in the blood stream which is only present in men. It is made in the prostate gland and leaks into the blood stream and is specific for prostate but not specific for prostate cancer.

There are two types of PSA. The PSA which is free within the circulation and that which is bound to a protein. A number of studies have shown that the ratio of free to bound PSA may result in a greater sensitivity in the possibility of being able to estimate the likelihood of a prostate cancer in an individual patient. Generally speaking, if the ratio is less than 10-15% the likelihood of a prostate cancer is increased.

The blood test may go up with things other than prostate cancer. It may go up if the prostate is enlarged, (benign or non-cancerous) which occurs as men get older or go up because of infection. Not all prostate cancers cause the blood test to go up but many do. Some patients have unsuspected prostate cancer diagnosed when the Pathologist examines the specimen after they have undergone Transurethral Resection of the Prostate ("rebores") as treatment for obstructive urinary symptoms.

Examination

In addition to the blood test, a digital rectal examination, (DRE) is carried out by the Doctor. For this examination the doctor inserts a gloved finger into the patient's back passage in order to feel the prostate gland. The Doctor is feeling for the size, shape, consistency and any irregularity suggestive of cancer. If either the PSA or DRE is abnormal, the doctor may suggest a biopsy be taken.

Biopsy

A biopsy from the prostate is a small piece of tissue which is taken with a special needle. It is usually necessary for the prostate to be examined with a transrectal ultrasound, (TRUS) which is carried out without the need for anaesthetic. This examination is carried out by placing the Ultrasound probe in the back passage in a similar fashion to the DRE. The TRUS enables the prostate to be visualised looking for any abnormal areas, which may or may not be felt on the DRE. If abnormal areas are seen, the biopsy needle can be directed towards them. If no abnormalities are seen then it is usual to biopsy areas which are more likely to undergo a cancerous change. This usually means at least six to eight biopsies.

Pathology

The specimens taken are sent to the Pathologist for preparation and examination under the microscope. The only way any cancer can be diagnosed correctly is by the visualisation in the pathology specimen.

Gleason Score

A Gleason Score is a number given to the type of prostate cancer cells in an attempt by the Pathologist to say "how bad" the cancer might be. It is a method of grading the tumour. A Gleason Score is a number ranging from 2 to 10.

Gleason Scores of 2 are what is referred to as "well differentiated" tumours which are likely to respond to treatment better than a Gleason Score 10 which is usually described as "undifferentiated" in that it looks nothing like the normal non-cancerous prostate tissue at all.

Staging

After the tumour has been graded it is necessary to carry out staging. Staging means trying to find any evidence of spread outside the prostate. Often a CT Scan, Ultrasound or MRI, (Magnetic Resonance Imaging) is used to inspect the abdominal cavity in order to attempt to detect any spread to the internal lymph glands or lymph nodes.

The glands or lymph nodes are small, bean - sized areas within the body which are associated with the body's immune system and tend to fight infection and cancer. For example if a patient has a sore throat, the glands in the neck are easily felt and often tender and swollen from the infection. If a patient has a cancer of the throat, the cancer may spread to the glands of the neck. In similar fashion a prostate cancer may spread to the glands inside the body.

Bone Scan

Prostate cancer has a tendency to spread to the bones of the body, chiefly to the back. A bone scan is a Nuclear Medicine imaging procedure which involves an injection of extremely low dose radio - nucleotide material into a vein, usually in the arm which then circulates through the body and is able to show up areas of spread of prostate cancer to bone.

Observation

In some cases, prostate cancers are very low in aggression and may be discovered incidentally through a raised PSA or at the time of Transurethral Resection of Prostate for obstructive symptoms. In those cases, it may be appropriate to continue to observe the patient to see how active the cancer is and whether any treatment may be beneficial in order for the patient to live for a long time and a good time. It is not usual to carry out a TRUS and biopsy to find a prostate cancer if observation is likely to be considered as a form of management because, although the risks of complications from biopsy are small, the possibility of occurrence is well recognized.

Radical Prostatectomy

A Radical Prostatectomy is an open (cutting) surgical procedure, which may also be performed in a minimally invasive (keyhole) manner under certain circumstances. It is the total removal of the prostate gland and seminal vesicles, which are two small pouches on the back surface of the prostate through which sperm pass. The bladder opening is then joined back to the urethra (pipe down the penis) with stitches just above the muscle of control (distal urethral sphincter). This procedure is designed to lead to a possible cure. The cure rate for this procedure is in the vicinity of 80% over all age groups, grades and stages. It is most effective in Gleason < 7, PSA < 10.

father a child by normal means if they wish. In fact, all treatments for localized prostate cancer will cause a reduction or complete loss of ejaculate fluid.

Side Effects of Radical Prostatectomy

Approximately 5% of men will have some degree of urinary leakage permanently following the procedure. That leakage may be what is called urge incontinence. That is, the failure to get to the toilet on time. Stress incontinence is leakage with coughing or sneezing, for example. Total incontinence is continuous leakage. A large number of men will find they are unable to achieve an erection following the procedure. Every attempt is usually made to preserve the nerves and blood vessels which cause erections. However, there can be irritation to those such that recovery is not complete. Alternatively they may have to be removed to clear the cancer. There are a number of methods of treatment for impotence. These treatments are generally best started about six weeks after the surgery as in many cases spontaneous erections may not return for 12-18 months. All patients who have a Radical Prostatectomy will find that there is no ejaculate fluid coming out when they achieve orgasm and therefore it will not be possible for them to

10 Year Cancer Specific Survival (Radiotherapy)

Author	Low Risk	Medium Risk	High Risk
Beyer	97%	83%	77%

High Intensity Focused Ultrasound (HIFU)

This is a method of heating the prostate to high temperatures using ultrasound to attempt to kill the cancer cells. This is done by an Ultrasound probe placed in the back passage and focused on the area being treated. The operation takes approximately 3 hours. A catheter is usually left in place for 14 days. Approximately 28% of patients require two treatments, 9 % of patients developed prolonged retention and 4% developed urethral strictures. Approximately 65 - 80% of patients developed impotence and recto-urethral fistulas were present in 1%. Results for 5 year follow - up for Gleason scores less than or equal to 6 are shown. They are based only on lowering the PSA levels. There are no Medicare or Private Insurance Fund Rebates for this procedure. Research is continuing with this type of treatment.

Results of Treatment

CATEGORIES OF RISK

	T (Stage)	PSA	Gleason
Low Risk	T2A	PSA >=10	>= 6
Medium Risk (one of)	>=T2B	PSA >10	>7
High Risk (two of)	>=T2B	PSA >10	<7

DISEASE-FREE SURVIVAL

Author	Cases	Follow-up Years	Low Risk	Med Risk	High Risk
Bahn	590	7	92%	89%	89%
Donnelly	76	5	60%	77%	48%

Author	Low Risk	Medium Risk	High Risk
Beyer(HIFU)	78%	53%	36%

Side Effects	%
Urethral Damage	6%
Incontinence	3%
Retention	3%
Pelvic Pain	4%
Impotence	80%

Random Control EBRT vs. Cryoablation (Primary Therapy)¹

	Hormone Therapy	3 Years	4 Years	Death**	Failure *
EBRT	Yes	85.8%	74.6%	4	32 (26%)
Cryo	No	82.0%	80.1%	5	25 (20%)

Reference	Number	Median Follow-up (Months)	Biopsy Proven Positive	Biopsy Proven Positive	Potent
			Treated Side	Untreated Side	
Lambert*	25	28	4%	8%	71.0%
Bahn**	31	70	0%	4%	88.9%

48.1% Spontaneous
40.8% Treated