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Medicine for Managers

Dr Paul Lambden BSc MB BS BDS FDSRCSEng MRCS LRCP DRCOG MHSM FRSM

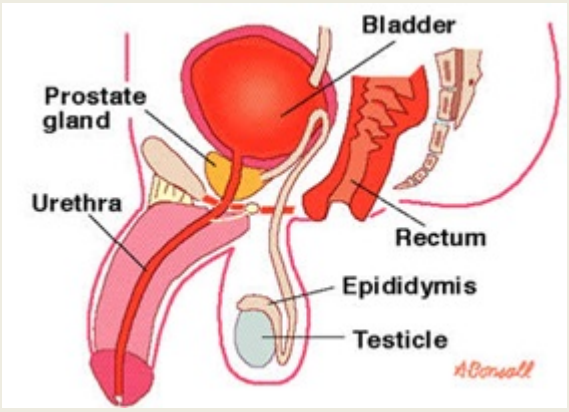
Prostate Cancer

Prostate cancer is the commonest cancer in men in the UK. It affects one in eight men in their lifetime and there are 55,000 new cases annually, with highest incidence in the 75-79 age group. It causes 12,000 deaths a year, with the highest number in the over 90s. In the 25 years since 1994, the incidence of the disease has increased by over 50% from about 125/100,000 to about 178/100,000. In the UK 95% of men with the disease survive for one year and 90% survive for 5 years.

What and where is the prostate?

The prostate gland is about the size of a walnut. It is located just below the bladder and surrounds the ***urethra*** (the tube through which urine passes from the bladder to the outside)

The prostate is a mixture of glandular and muscular tissue. It has ducts (small tubules) which open into the urethra.



The purpose of the gland is produce ***seminal fluid*** which acts as the transport for the sperm released during ***ejaculation***. The muscular elements of the prostate push the sperm-containing fluid out from the penis.

Cancer of the prostate is in some ways a strange tumour because it may develop slowly without symptoms for many years.

Even when symptoms do develop they may also indicate non-sinister prostatic changes.

Symptoms

The symptoms, sometimes uncharitably called 'old man's disease' are essentially due to enlargement of the prostate which squeezes the urethra and causes partial obstruction. The result may be:

- Frequency of micturition (urination)
- Poor flow
- Hesitancy (difficulty in starting to pass urine)
- Straining to pass urine
- Post-micturition dribbling
- Feeling of inadequate bladder emptying

Many men develop similar symptoms because of the tendency of the prostate to enlarge with advancing age. It is entirely benign and is called ***benign prostatic hypertrophy***.

The Causes of Prostate Cancer

It is largely a disease of older men but a close family history of disease under the age of sixty

appears to increase the risk and it is more common in Afro-Caribbean men.

Its occurrence is lower in men who are not obese, who exercise regularly, who do not drink alcohol to excess and who have a balanced healthy diet. It has been suggested that sexual abstinence may increase the risk.

Diagnosis

Prostate cancer can be difficult to diagnose, especially in its early stages, because the symptoms may be vague and there is no specific test which can identify the presence of the tumour. Patients with urinary symptoms who visit the GP will undergo a general examination and the GP is likely to:

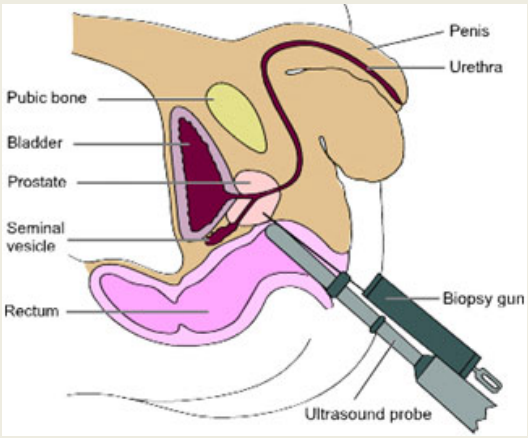
- Test a specimen of urine to exclude infection
- Examine the prostate by inserting a gloved finger into the back passage

The examination allows an assessment of the size of the prostate and whether any specific nodules or lumps can be felt. It is not a very comfortable procedure but it is not painful.

- Blood is taken for a chemical called ***Prostate-Specific Antigen*** (PSA). PSA is a protein produced by the prostate gland and which slowly increases with age. The test may be unreliable because some men with a raised PSA will not have cancer and some men without a raised PSA will have cancer. It is often more useful in serial tests where successive results show a rising trend.

The GP will make an assessment of the gland based on the history, age, family history and the findings on examination.

If cancer of the prostate is a possible diagnosis the man will be referred to the hospital using a two-week rule referral. It is important that the GP explains the possibility of malignancy but that the prostatic changes may be benign, and that tests can establish the diagnosis.



At the hospital the specialist will undertake further tests:

- Re-examination
- Biopsy of the prostate. There are several ways of taking a specimen but the most common is through the back passage (***rectum***) by a technique called ***Transrectal Ultrasound-guided biopsy*** (TRUS).

The ultrasound probe creates a picture of the area using ultrasound and the needle can be guided into the prostate. The ultrasound does not show the tumour, if present, itself but does allow the needle to be passed accurately into

the appropriate area of the prostate. An alternative approach is by a needle inserted into the skin between the scrotum and the rectum, again using ultrasound. Unfortunately one in five cancers is missed using these techniques because the tumours may be small or confined only to one area of the prostate.

The specimen obtained is examined under the microscope. The result may be to confirm the presence of a tumour and, if present, can also make an assessment of the degree of malignancy. Some tumours are of low risk such that they can effectively be left untreated.

- An MRI or CT scan may be necessary in circumstances where the histological examination of the tumour sample suggests that it might have the potential for spread. The scan can identify any cancer spread into bones and the pictures obtained may be enhanced by the use of a radio-active dye which accumulates in areas of bony abnormality

The Treatment of Prostate Cancer

For some men in whom a diagnosis of prostate cancer is made, no treatment will be necessary because of the low-grade, slow-growing nature of the tumour. In those patients, they are monitored only so that intervention can occur should the tumour worsen or start to cause symptoms.

If treatment proves to become necessary it is aimed at controlling or minimising its effects so that it does not disrupt everyday life or reduce life expectancy. Such patients often die of causes unrelated to the prostatic disease.

If the tumour has already spread at diagnosis, the aim may not be to attempt to cure it but to contain it, to minimise the symptoms and to extend the life expectancy.

In order to plan treatment of prostate cancer when appropriate, the tumour is ***'staged'***, as outlined in NICE guidance.

Stage 1: tumour is small and contained in the prostate gland.
Stage 2: tumour is large but still within the prostate gland.
Usually a Stage 1 tumour cannot be felt by digital rectal examination but a Stage 2 tumour can be felt.
Stage 3: spread of the tumour into the seminal ducts.
Stage 4: distant spread to the bowel, bladder or bones.

The ***Gleason (or Grade) Score*** is used to evaluate the aggressiveness of the cancer. Cancer cells are graded from 1 to 5 according to how abnormal they are and the Score is calculated from the most common grade, plus the highest grade of cell in the sample. The score is therefore the sum of two parts, for example the Gleason Score may be 7 (3+4).

Treatment will depend on age, state of health and estimated life expectancy. The objective will be to allow the person to die with the tumour present rather than as a result of the complications of the tumour. Two-thirds of men with prostate cancer do not need treatment unless the cancer changes, a process called ***watchful waiting***.

Forms of Treatment

High Intensity Focused Ultrasound is non-invasive and successful using focused ultrasound waves to heat and destroy cancerous cells, sparing nearby healthy structures. It is a technique used in men with early or intermediate, localised disease, generally in the lower part of the prostate.

Irreversible Electroporation (IRE), also known as NanoKnife, is an advanced, minimally invasive treatment, approved for us by NICE in 2022, for

prostate cancer that uses electrical pulses to destroy cancerous cells by damaging their cell membranes while preserving surrounding healthy tissue. It is particularly suitable for men with tumours at the front of the prostate gland.

Radical Prostatectomy. This treatment may cure localised prostate cancer by removing the whole gland. However, the procedure has the usual post-operative risks such as pain, infection and death (1 in 250 men over 65, 1 in 1,000 under 65). Other complications include incontinence for about 10% of patients and erectile failure for up to half of all men. The operation may be followed by radiotherapy if necessary.

Trans-Urethral Resection of the Prostate (TURP). This procedure involves a cystoscopy and the insertion into the prostate through the cystoscope of an instrument to remove parts of the prostate. It is an effective treatment for relieving symptoms but it does not cure the disease.

Radiotherapy. It is valuable for localised cancer and may slow the progress of metastatic cancer. In more advanced cases, the treatment may relieve or eliminate some symptoms.

However, the treatment will potentially have a number of symptoms including persistent cystitis (bladder infection), diarrhoea and lassitude. A proportion of men continue to suffer from diarrhoea and rectal bleeding, and incontinence.

Sometimes the radiotherapy may be provided by the implantation of radio-active 'seeds' in the prostate within the tumour which enables high doses to be administered without damage to more distant tissue. However, localised radiation effects may be suffered.

Hormone Therapy. This may be used with radiotherapy and the hormone, which blocks the effect of testosterone (the hormone which stimulates the prostatic cancer) will shrink a prostatic tumour and may slow the spread of a metastatic tumour. It does not cure cancer. The treatment can be given as injections or tablets.

Side effects include loss of sex drive, erectile failure, flushes, weight gain and breast enlargement.

An alternative is to remove the testicles (***orchidectomy***) and is the choice in some men.

If the tumour is advanced, a combination of treatment is usually the method of choice to slow the disease and may involve radiotherapy and chemotherapy. For some men no treatment would be preferable because of potential side effects or the age of the person.

Screening for Prostate Cancer

There is no prostatic screening programme in the UK. The benefits do not outweigh the risks. The PSA blood test is used as a guide but may be unreliable and may give significant numbers of false positive negatives and positives. It is more useful when used as a serial assessment to identify trends in disease.

An effective screening test may produce a significant improvement in identifying the risk of acquiring the tumour and work proceeds to identify such a test.

paullambden@compuserve.com