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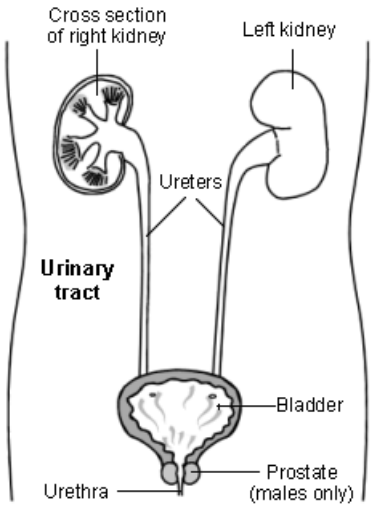
Bladder Cancer

The common early symptom of bladder cancer is blood in the urine. In most cases, the cancer is confined to the inside lining of the bladder. Treatment of these superficial bladder cancers is relatively easy and often curative. If the cancer has spread into or through the muscle layer of the bladder wall then treatment is less likely to be curative. Treatment can, however, often slow the progress of the cancer.

What is the bladder?



The bladder is part of the urinary tract. It is at the bottom of the tummy (abdomen). It fills with urine and we pass urine out from time to time through a tube called the urethra. The urethra passes through the prostate gland and penis in men. The urethra is shorter in women and opens just above the vagina.

Urine is made in the kidneys and contains water and waste materials. A tube called a ureter comes from each kidney and drains the urine into the bladder.

The cells that line the inside of the bladder are called transitional cells or urothelial cells. There is a thin layer of cells beneath the lining, called the lamina propria.

The outer part of the bladder wall contains a thick layer of muscle tissue which contracts from time to time to push out the urine.

What is bladder cancer and how common is it?

Bladder cancer is a common cancer; it is the seventh most common cancer in the UK. About 10,000 people develop bladder cancer in the UK each year. In most cases in the UK, the bladder cancer develops from the transitional cells which line the inside of the bladder. This type of cancer is called transitional cell bladder cancer. Other types of bladder cancer are rare in the UK.

The rest of this leaflet only deals with the common type of bladder cancer - transitional cell bladder cancer.

Transitional cell bladder cancer is divided into two groups:

- **Superficial tumours**. These occur in about 4 in 5 cases. These tumours are confined to the inner lining, or just below the inside lining, of the bladder. Sometimes the cells which form this type of cancer multiply to form little growths which stick out like warts from the inside lining of the bladder.
- **Muscle-invasive tumours**. These occur in about 1 in 5 cases. These tumours have spread to the muscle layer of the bladder or right through the wall of the bladder.

The treatment and outlook for each of these two groups are very different. Superficial tumours rarely spread and can usually be cured. However, if left untreated, in some cases they can develop into muscle-invasive tumours. Muscle-invasive tumours have a high chance of spreading to other parts of the body (they metastasise) and treatment has less chance of being curative.

See the separate leaflet called Cancer for more information about cancer.

What causes bladder cancer?

A cancerous tumour starts from one abnormal cell. The exact reason why a cell becomes cancerous is unclear. It is thought that something damages or alters certain genes in the cell. This makes the cell abnormal and multiply out of control. See the separate leaflet called Causes of Cancer for more details.

In many cases, the reason why a bladder cancer develops is not known. However, there are factors which are known to alter the risk of bladder cancer developing. These include:

- Increasing age. Most bladder cancers occur in people over the age of 50. It is rare in people aged younger than 40.
- Smoking. Bladder cancer is 2-6 times more common in smokers than in non-smokers. Some of the chemicals from tobacco get into the body and are passed out in urine. These chemicals in the urine are damaging (carcinogenic) to the bladder cells. It is estimated that about half of bladder cancers are related to smoking.
- Other chemicals. Certain workplace and environmental chemicals have been linked to bladder cancer - for example, substances used in the rubber and dye industries. Many of these chemicals are now banned in the UK. However, bladder cancer may develop as late as 10-25 years after exposure to certain chemicals. This means that some cases are still being diagnosed in people who worked with these chemicals years ago.
- Gender. Bladder cancer is about three times more common in men than in women.
- Ethnic background. Bladder cancer is more common in white people than in black people.
- Previous radiotherapy or chemotherapy slightly increases the risk.
- Schistosomiasis. This bladder infection, which is caused by a parasite in certain hot countries, increases the risk.
- Repeated bouts of other types of bladder infection may also slightly increase the risk in some people.

What are the symptoms of bladder cancer?

Blood in urine

In most cases, the first symptom is to pass blood in your urine (haematuria). Haematuria caused by an early bladder tumour is usually painless. You should always see your doctor if you pass blood in your urine. The blood in your urine may come and go as the tumour bleeds from time to time.

Other symptoms

Some tumours may cause irritation of the bladder and cause symptoms similar to a urine infection. For example, passing urine frequently or pain on passing urine. If the cancer is a muscle-invasive type, and grows through the wall of the bladder, other symptoms may develop over time. For example, pain in the lower tummy (abdomen).

If the cancer spreads to other parts of the body, various other symptoms can develop.

How is bladder cancer diagnosed and assessed?

To confirm the diagnosis

Urine microscopy

A sample of urine can be sent to the laboratory to look for cancerous cells under the microscope. This test may detect cancer cells. However, if no cancer cells are seen it does not rule out bladder cancer. Further tests are done to confirm or rule out the diagnosis if symptoms suggest bladder cancer.

Cystoscopy

Cystoscopy is commonly done to confirm a bladder tumour. Having a cystoscopy entails a doctor or nurse looking into your bladder with a special thin telescope called a cystoscope. The cystoscope is passed into your bladder via your water pipe (urethra). A cystoscopy which is done just to look into your bladder is normally carried out under local anaesthetic. If a procedure is done, such as removing a tumour via a cystoscope, a general anaesthetic is usually used.

During cystoscopy a doctor or nurse can:

- See any areas on the lining of your bladder which look abnormal.
- Take small samples (biopsies) of suspicious areas. A small sample of tissue is removed from a part of the body and then examined under the microscope to look for abnormal cells.
- Remove a superficial tumour with instruments which can be passed down a side channel of the cystoscope.

See the separate leaflet called Cystoscopy for more details.

Special urine tests
Urine tests have been developed which can detect bladder cancer. For example, urine tests such as the UroVysion test, ImmunoCyt test and NMP-22 test. These tests detect chemicals, proteins and chromosomal changes in urine that are made by bladder cancer cells. However these tests are not routinely done, although their use is increasing in some hospitals.

Ultrasound scan
This is a safe and painless test which uses sound waves to create images of organs and structures inside your body. An ultrasound scan may be used to diagnose a bladder cancer.

Computerised tomography (CT) scan
Another test called CT urogram is a special type of CT scan that obtains pictures of your urinary tract. This is sometimes done to look for a bladder tumour.

Assessing the extent and spread
If initial tests confirm that the cancer is a superficial tumour then no further tests may be necessary. Superficial bladder tumours have a low risk of spread to other parts of the body.

However, if you have a muscle-invasive tumour, further tests may be advised to assess if the cancer has spread. For example, a CT scan, a magnetic resonance imaging (MRI) scan or other tests. This assessment is called staging of the cancer. The aim of staging is to find out:

- How much the tumour in the bladder has grown, and whether it has grown to the edge or through the outer part of the bladder wall.
- Whether the cancer has spread to local lymph nodes.
- Whether the cancer has spread to other areas of the body (metastasised).

By finding out the stage of the cancer, it helps doctors to advise on the best treatment options. It also gives a reasonable indication of outlook (prognosis). See the separate leaflet called Stages of Cancer for more details.

What is the treatment for superficial bladder tumours?

Removal of the tumour
Most superficial bladder tumours are removed by a specialist with the aid of a cystoscope (described earlier). This is called transurethral resection (TUR), as the tumour is removed (resected) via a cystoscope which is passed up the water pipe (urethra). It does not involve an operation to cut into the bladder. Thin instruments can be passed down a side channel of the cystoscope to remove the tumour.

Immediate chemotherapy
Following a TUR, it is usual to have one dose of chemotherapy in the bladder (intravesical chemotherapy). This is usually done within 24 hours of having a TUR. It involves inserting a liquid into the bladder via a tube (catheter) which then remains for a few hours. The liquid contains a chemotherapy medicine. Chemotherapy medicines kill cancer cells or stop them from multiplying. The aim is to kill any cancer cells that have been left behind following the TUR. Studies have shown that one dose of intravesical chemotherapy reduces the chance of the tumour returning in the future. See the separate leaflet called Chemotherapy for more details.

Further chemotherapy/immunotherapy
The tumour that is removed during a TUR is examined under the microscope. This enables the exact stage and type of the tumour to be determined. Depending on the stage and type of the cancer, further intravesical chemotherapy may be advised. This is done by using a catheter (as described above) and may be done every 1-4 weeks for several months. The aim is to be as certain as possible that all cancer cells are killed, which reduces the chance of the cancer returning.

The most commonly used medicine for further chemotherapy is called BCG. This is actually a vaccine which is used to prevent tuberculosis (TB). It is not clear how it works for bladder cancer. It may stimulate the immune system in some way to clear any abnormal cells in the bladder lining. So, strictly speaking, treatment with BCG is immunotherapy. Other chemotherapy medicines are occasionally used instead of BCG.

Repeat checks
After a superficial tumour is removed, you will need a cystoscopy every so often. A return of a tumour occurs in some cases, and routine check cystoscopies will detect these at an early stage. If one returns, it can be treated again. The time interval between check cystoscopies is every three months at first. It then becomes longer if your bladder remains free of tumour at each check. You may need a check cystoscopy every now and then for several years to make sure the tumour has not returned.

As mentioned above, urine tests have been developed to diagnose bladder cancer. If trials are successful, a urine test may become the way to check if a tumour has returned, rather than having a cystoscopy.

What are the treatment options for muscle-invasive tumours?

Treatment options that may be considered include surgery, chemotherapy and radiotherapy. The treatment advised for each case depends on various factors such as the stage of the cancer (how large the cancer is and whether it has spread), and your general health.

You should have a full discussion with a specialist who knows your case. He or she will be able to give the pros and cons, the likely success rate, the possible side-effects and other details about the possible treatment options for your type of cancer.

You should also discuss with your specialist the aims of treatment. For example:

- Treatment may aim to cure the cancer. Some bladder muscle-invasive cancers can be cured, particularly if they are treated in the early stages of the disease. (Doctors tend to use the word remission rather than the word cured. Remission means there is no sign of the cancer following treatment. If you are in remission, you may be cured. However, in some cases a cancer returns months or years later. This is why doctors are sometimes reluctant to use the word cured.)
- Treatment may aim to control the cancer. If a cure is not realistic, with treatment it is often possible to limit the growth or spread of the cancer so that it progresses less rapidly. This may keep you free of symptoms for some time.
- Treatment may aim to ease symptoms. If a cure is not possible, treatments may be used to reduce the size of a cancer, which may ease symptoms such as pain. If a cancer is advanced then you may require treatments such as painkillers or other treatments to help keep you free of pain or other symptoms.

Surgery

An operation to remove your bladder (a cystectomy) is the most common treatment. This is a major operation. Before surgery you need a full discussion with a surgeon to understand the implications of the operation planned. For example, you will need an alternative way of passing urine if you have your bladder removed. One way for this is by a urostomy. This involves a surgeon using a technique to arrange a system for urine to drain into a bag which you wear on the outside of your tummy (abdomen). An alternative operation may be possible where the surgeon creates an artificial type of bladder from a part of the gut.

A cystectomy can be undertaken by an open operation where you will have a scar on your abdominal wall or by keyhole surgery. Your surgeon will be able to discuss with you in detail which type of operation is most suitable for you.

Even if the cancer is advanced and a cure is not possible, some surgical techniques may still have a place to ease symptoms. For example, if the passage of urine is blocked by a tumour then placing a tube (catheter) or other techniques may be appropriate.

Radiotherapy

Radiotherapy is sometimes used instead of surgery. It can also be used for some people who have symptoms of pain or bleeding that are not improving. Radiotherapy is a treatment which uses high-energy beams of radiation which are focused on cancerous tissue. This kills cancer cells or stops cancer cells from multiplying. See the separate leaflet called Radiotherapy for more details.

Chemotherapy

Chemotherapy is a treatment of cancer by using anti-cancer medicines which kill cancer cells or stop them from multiplying. Prior to surgery or radiotherapy, a course of chemotherapy may be advised. This is called neoadjuvant chemotherapy. Chemotherapy used before surgery may improve the outlook (prognosis). In some cases a course of chemotherapy is given following surgery. See the separate leaflet called Chemotherapy for more details.

What is the outlook?

- **Superficial bladder tumours**. There is a good chance of a cure with treatment. Also, routine checks every few months following treatment will often detect returning tumours early and treatment can be repeated as necessary.
- **Muscle-invasive bladder tumours**. A cure is less likely than with a superficial tumour. As a rule, the earlier the stage of the tumour, the better the chance of a cure with the treatments listed above. However, even if it is not cured, treatment can often slow down the progression of the cancer.

The treatment of cancer is a developing area of medicine. New treatments continue to be developed and the information above about outlook is very general. The specialist who knows your case can give more accurate information about your particular outlook (prognosis), and how well your type and stage of cancer is likely to respond to treatment.

Further reading & references

- Bladder cancer: diagnosis and management of bladder cancer; NICE Clinical Guidelines (February 2015)
- Non-muscle-invasive Bladder Cancer; European Association of Urology Guidelines (2016)
- Muscle-invasive and Metastatic Bladder Cancer; European Association of Urology Guidelines (2016)
- Bellmunt J, Orsola A, Leow JJ, et al; Bladder cancer: ESMO Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2014 Sep;25 Suppl 3:iii40-8. doi: 10.1093/annonc/mdu223. Epub 2014 Aug 5.

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