# **REVIEW ARTICLE**

# **DIAGNOSIS & PROGNOSIS OF PROSTATE CANCER**

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#### **ABSTRACT:**

Prostate cancer, also known as carcinoma of the prostate, is the development of cancer in the prostate, a gland in the male reproductive system. Most prostate cancers are slow growing; however, some grow relatively quickly. The cancer cells may spread from the prostate to other parts of the body, particularly the bones and lymph nodes. It may initially cause no symptoms. In later stages it can lead to difficulty urinating, blood in the urine, or pain in the pelvis, back or when urinating. A disease known as benign prostatic hyperplasia may produce similar symptoms. Other late symptoms may include feeling tired due to low levels of red blood cells. Prostate cancer is classified as an adenocarcinoma, or glandular cancer, that begins when normal semensecreting prostate gland cells mutate into cancer cells. The region of prostate gland where the adenocarcinoma is most common is the peripheral zone. The first decision to be made in managing prostate cancer is whether treatment is needed. Prostate cancer, especially low-grade forms found in elderly men, often grows so slowly that no treatment is required. Treatment may also be inappropriate if a person has other serious health problems or is not expected to live long enough for symptoms to appear.

Keywords: Prostate, Signs, Symptoms, Diagnosis, Management.

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#### NTRODUCTION

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After a person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries. Cancer begins when cells in a part of

repair injuries. Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because abnormal cells grow out of control.<sup>1</sup>

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. In most cases the cancer cells form a tumor. Cancer cells can also invade (grow into) other tissues, something that normal cells can't do. Growing out of control and invading other tissues are what makes a cell a cancer cell.<sup>2</sup>

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called metastasis. It happens when the cancer cells get into the bloodstream or lymph vessels of our body. No matter where a cancer may spread, it is named (and treated) based on the place where it started. For example, prostate cancer that has spread to the bones is still prostate cancer, not bone cancer. Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. This is why people with cancer need treatment that is aimed at their particular kind of cancer.<sup>3</sup> The prostate is a gland that makes a white-colored fluid. Sperm mixes with this fluid and other fluids to form semen. Semen is ejected from the body through the penis during ejaculation.<sup>4</sup> The fluid from the prostate protects sperm from the acid inside a woman's vagina.

Prostate cancer is predominantly a disease of older men (aged 65–79 years) but around 25% of cases occur in men younger than 65. There is also higher incidence of and mortality from prostate cancer in men of black African-Caribbean family origin compared with white Caucasian men.<sup>5</sup>

Aging, being of African-American descent, and having family members with prostate cancer have been linked to a higher chance of getting prostate cancer. Other related factors include contact with Agent Orange, obesity, smoking, and poor diet.<sup>6</sup> Not all men with these conditions get prostate cancer and some men without these conditions do. Prostate cancer is common among older men. However, prostate cancer in older men often doesn't become a problem.<sup>7</sup> Prostate cancer is usually diagnosed after a blood test in primary care has shown elevated antigen (PSA) prostate-specific levels. The introduction of PSA testing has significantly reduced the number of men presenting with metastatic cancer since the 1980s. Most prostate cancers are now either localized or locally advanced at diagnosis, with no evidence of spread beyond the pelvis.<sup>8</sup> đ

## ETIOLOGY

Prostate cancer is the most common malignancy diagnosed in North American men (other than skin cancer). One out of every 6 to 7 men will develop the disease during his lifetime. The exact cause of prostate cancer is still unknown.9 However, a combination of genetic, nutritional and environmental factors appear to play a role in it's development. Typically, prostate cancer begins in the outer part of the gland. When confined within the prostate, it is called localized prostate cancer. Prostate cancer may behave in many different ways in different men. It may be relatively slow growing, but it may also be more aggressive in its behavior with a tendency to metastasize or spread to the lymph nodes, bones, or other parts of the body. It is this latter form of prostate cancer that is life threatening.<sup>10</sup> However there are certain risk factors that have been linked with developing prostate cancer, including: • family history: a father or brother with prostate cancer now or in the past or, in some instances, a relative with breast cancer • older age • history of subfertility • a diet high in animal fat and protein • race: men of Caucasian background are more likely to get prostate cancer than Asian men (particularly Asian men eating Asian rather than western diets).<sup>11</sup>

#### SIGNS & SYMPTOMS

The vast majority of patients do not have any symptoms when diagnosed with prostate cancer. Symptoms that may indicate prostate cancer are listed below but it is important to note that most men with these symptoms have benign (non-cancer) related causes:<sup>12</sup> • Frequent urination, especially at night • Urgency in urinating • Inability to start your urine stream • A weak or interrupted urine stream • Pain or burning during urination • A feeling that your bladder doesn't empty completely • Blood in the urine • Pain in the back, hips or pelvis • Weakness, weight loss, loss of appetite (common to all cancers when advanced) As noted above, although these symptoms can be caused by prostate cancer, they are more frequently caused by other conditions that are not cancer. A very common one is benign prostatic hyperplasia (BPH). As men age, the prostate often enlarges and can press on and block the urethra and bladder, producing some of the symptoms described above. BPH can be successfully treated with medication or surgery.<sup>13</sup>

# **NUTRITION & LIFE STYLE**

Research in the past few years has shown that diet modification might decrease the chances of developing prostate cancer, reduce the likelihood of having a prostate cancer recurrence, or help slow the progression of the disease. Although it will likely take some time before results of these studies conclusively demonstrate the benefits of nutrition in prostate cancer, there is already good evidence indicating that some dietary changes, such as increasing consumption of fruits and vegetables rich in antioxidants as well as fish rich in omega-3 fatty acids, are beneficial in other chronic diseases, particularly heart disease. Adoption of these dietary changes can therefore be seen as an important step in a path toward a more healthy lifestyle overall.<sup>14,15</sup>

## DIAGNOSIS OF PROSTATE CANCER<sup>16</sup>

Prostate cancer is diagnosed by a number of tests.

a) PSA test The PSA test is a blood test that measures the amount of a protein called prostate specific antigen (PSA) which is produced by the prostate. All men have some PSA in their blood. The level of PSA can be affected by a number of things, including age, an enlarged prostate, infection, vigorous exercise, ejaculation, and prostate cancer. PSA is measured in nanograms per millilitre of blood (ng/ml). • Up to 3ng/ml for a man aged 50 to 59. • Up to 4ng/ml for a man aged 60 to 69. • Up to 5ng/ml for a man aged 70 or over. A PSA level higher than the normal range for your age may suggest a problem with the prostate. But a normal PSA result does not rule out prostate cancer. Similarly, if your PSA level is only slightly above the normal range for your age, this does not always mean that you have prostate cancer.<sup>17</sup>

**b)** Digital rectal examination (DRE) A digital rectal examination (DRE) involves a doctor or nurse feeling the prostate gland through the wall of the back passage (rectum). They will wear gloves and put some gel on their finger to make it more comfortable. They are feeling for any hard or irregular areas that may be a sign of cancer.

c) **Prostate biopsy.** During a prostate biopsy, small amounts of tissue are removed from different areas of the prostate gland. These samples of tissue are sent to the laboratory to be checked by a doctor who specialises in looking at cells under the microscope (a pathologist). Gleason score A pathologist will look at your biopsy samples under the microscope. If a sample contains cancer it is 'graded' to show how active the cancer is. The pathologist looks at the pattern made by the cancer cells and gives that pattern a grade from 1 to 5. This is called Gleason grading.

d) CT scan. A computerised tomography (CT) scan uses X-rays to take pictures of the body from different angles. This helps the specialist to see whether the cancer could have spread to the surrounding tissues. e) MRI scan. Magnetic resonance imaging (MRI) uses magnets rather than X-rays to create an image of your prostate and other tissues to see whether the cancer has spread.

**f) Bone scan.** A bone scan may show whether any cancer cells have spread from the prostate to the bone. A small amount of a safe radioactive dye is injected into a vein in your arm. After two to three hours, you will have a scan to find any areas where the dye has collected. This can show if prostate cancer cells have spread to your bones.

## **STAGING PROSTATE CANCER<sup>18</sup>**

Staging means how far cancer has spread, it may be described as one of the following: • Localised – the cancer is small and is contained within the prostate gland. • Locally advanced – the cancer is larger and has spread outside the prostate to the pelvic region, for example the seminal vesicles, lymph or bladder. • Advanced – the cancer has spread beyond the prostate into adjacent organs, such as the bladder, rectum and pelvic wall or to distant areas such as the lymph glands or bones.

#### MANAGEMENT<sup>19,20</sup>

- a) Active surveillance. It is when your doctor treatment recommends no or deferred (postponed) treatment, with a view to having treatment if it becomes required. The cancer is closely monitored with regular check-ups. This may include further biopsies of the prostate. Active surveillance may be suggested for some men, for example, if the cancer is small (low volume) and slow growing (low grade) and it is unlikely to be at significant risk of spreading or causing symptoms. This management strategy may be a reasonable option if the possible treatment side effects would have more impact on your quality of life than the cancer itself.
- b) Watchful waiting. In some circumstances, less strict monitoring is used and further biopsies are not required. This is called watchful waiting and is a way of monitoring cancer that isn't causing any symptoms or problems. It is another management option.
- M c) Radical prostatectomy. Your doctor may suggest surgery if you have early prostate cancer, are fit enough for surgery and expect to live longer than 10 years. The procedure is called a radical prostatectomy, which is the removal of the prostate gland, part of the urethra and the seminal vesicles, glands located close by that store semen. For more aggressive cancer, the adjacent lymph glands may also be removed (pelvic lymph node dissection). Radical prostatectomy may be performed using different surgery techniques (open, laparoscopic or robotic-assisted). Whichever approach is used, a radical prostatectomy is major surgery. Men usually return to normal activities within 2-6 weeks.
  - d) Open radical prostatectomy. An open radical prostatectomy is usually done through a 10–12cm cut in the lower abdomen. After the prostate is removed, the urethra is rejoined to the bladder. You will need to stay in hospital for 3–7 days to recover. A thin tube (catheter) will be used to collect your urine in a bag and will be removed 6–14 days after the surgery. You may have some side effects from the surgery (see page 26). Depending on your work and lifestyle, you should be able to return to your usual

activities within 4–6 weeks. Most men can resume driving within a couple of weeks, but should avoid heavy lifting for six weeks.

- e) Laparoscopic radical prostatectomy. Some patients may be able to have the prostate removed via keyhole surgery, called a laparoscopic radical prostatectomy (LRP). In this procedure, about five small cuts are made in the abdomen and small surgical instruments are inserted. The surgeon performs the procedure while watching a screen and manipulating the instruments. Surgeons require specialised training to perform this procedure and it may not be available in all hospitals.
- f) Robotic-assisted radical prostatectomy. Another form of keyhole surgery is roboticassisted surgery (robotic-assisted radical prostatectomy or RARP). A roboticassisted device allows the surgeon to see a threedimensional picture and also to use instruments more advanced than those used for conventional laparoscopic surgery. This method is becoming more widely available in Australia. Compared with open radical prostatectomy, robotic-assisted surgery leads to a shorter hospital stay, less blood loss, a smaller scar and faster healing.

# SIDE EFFECTS OF RADICAL PROSTATECTOMIES<sup>21</sup>

These operations may cause some or all of the following side effects: • Bladder control - A radical prostatectomy may make it difficult for you to control your bladder. Known as urinary incontinence, this condition usually improves within a few months following the surgery, but may take up to one year to fully stabilise. There are aids and exercises for urine control problems, and it may be helpful to see a continence physiotherapist or continence nurse before or as soon as possible after vour operation. • Nerve damage - The nerves and muscles needed for erections and bladder control are near the prostate. They can be damaged during surgery, causing problems with erections in particular. • Erectile dysfunction - Many men experience impotence (erection problems) after surgery. It may take months to a few years for erections to improve. Some men may not recover strong erections. Drugs and injections can help if you have ongoing problems with erections. • Infertility – As the tubes from the testicles (vas deferens) are sealed and the prostate and seminal

vesicles are removed, semen is no longer ejaculated during orgasm. This results in infertility. If you wish to have children, speak to your doctor before treatment about sperm banking or other options. • **Penile shortening** – Some men report a decrease in penis length after surgery. If this occurs, there are ways to prevent and treat it.

#### CONCLUSION

The result of early detection and early intervention has been a steady decline in prostate cancer mortality of about 30% over the last 15-20 years. This decline is associated with a significant stage migration. According to the Center for Prostate Disease Research, in 1988, 19.2% of men with prostate cancer presented with radiographic evidence of metastatic disease. Of the 80% presenting with clinically localized disease, 35% actually had nodal metastases at the time of operative treatment, and 67% had evidence of locally advanced extraprostatic disease. Today, less that 4% present with metastases.Prostate cancer is an androgen dependant adenocarcinoma. The tumor is slow growing and often begins in the posterior M side of the prostate. It spreads by direct extension by D the lymph nodes, seminal vesicles, urethral mucosa, s and bladder wall. It all spreads via the veins from RADICAL R the prostate wich effect the pelvic bones, head of the femur, lower lumbar spine, liver, and lungs. Therefore, it is important for men to have a complete knowledge about the disease.

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