Prostate cancer – an overview of non surgical treatments

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Profile

The Gleason Score

An overview of non surgical treatments for prostate cancer

Oncologists are medical doctors who are experts in the treatment of cancer. In the UK there are two types of Oncologists: Clinical and Medical Oncologists. Clinical Oncologists treat prostate cancer using Radiotherapy, Chemotherapy and Hormone Therapy. A Medical Oncologist treats prostate cancer using Chemotherapy, Hormone Therapy and Immunotherapy. These are non-surgical treatments

Most men with prostate cancer are likely to see a Clinical Oncologist at some point during their treatment. Sometimes a treatment plan will involve surgery together with one or more non- surgical treatments. All treatment plans are discussed in a Multi-Disciplinary Team (MDT) meeting – which will include at least one urological surgeon, an oncologist, a radiologist and a pathologist

There are three types of treatment that can be used with surgery, or each other, depending on the Gleason grading, staging, and spread of the cancer.

These are:

- Hormone Therapies
- Radiation Therapy (or Radiotherapy)
- Chemotherapy
- Immunotherapy

Sometimes the words adjuvant (afterwards), neoadjuvant (before) and concomitant (together with) are used to describe these treatments when they are used in different combinations.

Hormone Therapy

Prostate cancer cells are stimulated to grow by the presence of male hormones called Androgens. The main Androgens are testosterone and dihydrotestosterone. The aim of hormone therapy is to reduce the presence of these male hormones. They are produced mainly in the testes and to a lesser extent by the adrenal glands. Androgen Deprivation Therapy (ADT) or Androgen Suppression Therapy is used to block androgens. This is sometimes called Hormone Therapy.

ADT makes prostate cancer shrink or grow more slowly for a time, but this treatment on its own, cannot cure prostate cancer.

Hormone Therapy is often used:

- If the cancer has spread to a point where it cannot be cured by radiotherapy or surgery alone
- If the cancer returns after surgery or radiotherapy
- Before, during and after radiotherapy
- Hormone Therapy is often used together with radiotherapy in an attempt to shrink the cancer and improve the outcome of the treatment. This could be in circumstances where there is a high PSA and Gleason score (link below) which may mean that there is a higher risk of the cancer coming back after treatment.
- If you are not able to undergo surgery or radiotherapy for any reason hormones may be used instead.

Radiotherapy

Radiation based therapies usually use high energy photon beams or particles to destroy cancer cells by damaging the DNA.

There are a number of different types of Radiotherapy – described below. The principal ones used in the UK – both in the NHS and the private sector are External Beam Radiation Therapy using Intensity Modulated Radiotherapy, and Brachytherapy.

Occasionally Cyberknife (TM) (Hypofractionated Radiotherapy) is used. Proton Beam Therapy is used in America but is not considered a standard treatment option in the UK. More work investigation and study would need to be undertaken for Proton Beam Therapy to be used routinely.

External Beam Radiation Therapy (EBRT).

This is a common type of radiation which is used to treat the prostate gland and the cancer cells within it. It is delivered as an outpatient treatment over 4-8 weeks. If it is delivered over this period of time, its aim is often to cure the prostate cancer.

Before the weeks of treatment start, the Radiotherapy is planned. This requires a special CT scan – a 'CT planning scan'. The bladder may have to be filled or the rectum

emptied before this is completed.

The machine that delivers this type of Radiotherapy is usually a Linear Accelerator. These are large machines which move around the person being treated while they are lying on a hard couch. The machine does not touch the person but delivers the radiation from many different angles. The head of the machine contains sophisticated lead leaves that are carefully controlled to shape the radiation beam so that it minimises damage to normal tissue whilst maximising the radiation to the prostate gland. This state-of-the-art treatment is called Intensity Modulated Radiotherapy (IMRT) which is now available in most NHS Trusts.

One dose of radiation (one visit) is called a "fraction". Traditionally EBRT/IMRT for prostate cancer has been delivered via 37 fractions. With the greater accuracy of the machines and sophistication of the planning systems treatments can now be given in less fractions of greater dose: some treatment plans now deliver the radiation in 20 fractions.

SBRT including Cyberknife

Cyberknife is a type of Stereotactic Body Radiation Therapy (SBRT). It is an image guided system that delivers much higher doses of radiation with great accuracy. Its big advantage is that treatment can be delivered in 5 doses.

It is used as a primary treatment for early stage prostate cancer, often in conjunction with hormone therapy and also to slow down advanced prostate cancer.

MR Linac

MR Linac systems cintegrate an MR scanner and a LINAC (linear accelerator) to locate tumours with great precision in real time, and shape of X-ray beams in real time accordingly, It is particularly useful for organs such as the lung or prostate which change shape and position all the time.

Proton Beam Therapy

Proton Beam is a new type of particle therapy that uses a beam of proton particles to destroy the cancer cells. The advantage of proton therapy over other types of EBRT is that the charged particles can be targeted to a specific depth and damage to normal tissue from entry, exiting and scattering of the beam is minimised. The equipment is very expensive. There is only one installation in the UK (in Swansea) although a number of centres are planned. There is no evidence to show it is more effective than IMRT in prostate cancer, although it is more effective in a number of limited areas: cancers affecting the optic nerve, and treating children.

Brachytherapy,

Brachtherapy involves planting radioactive seeds in or next to the cancer lesions in the prostate. There are two types of Brachytherapy – "High Dose" and "Low Dose" (see the

specific pages on Brachytherapy).

Chemotherapy

Typically cancer cells divide and multiply faster than normal cells. Chemotherapy drugs are designed to attack and destroy cells that are dividing quickly, which is why they can be an effective treatment for cancers.

There are several types of normal cell which also divide quickly, namely in bone marrow, where new red blood cells are made, the lining of the mouth, the intestines, and hair follicles.

For this reason, Chemotherapy can have unpleasant side effects, such as hair loss, anaemia, mouth sores, and nausea and vomiting to name a few.

Chemotherapy is not the typical treatment for early stage prostate cancer, but may be used if the prostate cancer has spread outside the prostate gland (extra capsular) and/or hormone therapy is not slowing down or shrinking the cancer lesions.

There are some studies underway researching whether Chemotherapy in conjunction with radical prostatectomy (removal of the prostate) leads to better outcomes.

Immunotherapy

Immunotherapy is the subject of a lot of research and is very expensive.

It works by stimulating or activating your immune system to attack and disable or kill prostate cancer cells.

It can be used when cancer that has spread outside the prostate (metastatic cancer) and hormone therapy has stopped working. Treatment is over several week and can have unpleasant side effects related to overactive immune responses, including fatigue, cough, shortness of breath, nausea, constipation, itching, rash, and decreased appetite. It may require a course of steroids or withdrawing the drug to 'calm down' the immune system.

If you have any comments as to how this overview of non surgical treatments for prostate cancer can be improved, please contact me.

Theranostics treatment for advanced prostate cancer

Where to access theranostic therapy

Prostate cancer treatment – Immunotherapy

Prostate cancer – Assessing response to treatment

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