

HDR Brachytherapy

I. Introduction

Brachytherapy is a form of radiation therapy that uses radioactive sources that are directly placed into or around the tumour to deliver higher doses of radiation to more specific sites in the body. This technique ensures high radiation dose to be given to target areas, while minimising radiation exposure to the surrounding healthy tissues.

The main methods of brachytherapy delivery consist of interstitial treatment, intracavitary treatment and surface mould treatment. Interstitial treatment involves placing the radioactive source directly into the tissue, while intracavitary treatment involves placing the source into a space or opening where the tumour is located such as the oesophagus/vagina. Surface mould treatment involves treating superficial parts of the body such as the skin by an overlying radioactive source in a customised surface applicator.

High dose rate remote afterloading brachytherapy (HDR) involves inserting applicators/catheters into or adjacent to the cancer tissue. A computer driven apparatus, called a remote afterloading device, then drives the radiation source through the catheters to the tumour site. The source remains in position for a predetermined amount of time. After the desired dose is achieved, the remote afterloading device will withdraw the radioactive source.

Brachytherapy can be used either alone or in combination with other types of treatment. Sometimes it is used after surgery to eliminate the residual cancer cells, or it can be used in conjunction with external beam radiation.

Not all tumour categories are applicable to brachytherapy. The more common tumours suitable for brachytherapy are: nasopharyngeal cancers, head and neck tumours, tracheal/oesophageal cancers, sarcomas of upper/lower limbs or body, pelvic malignancy such as colorectal cancers, cervical cancers etc.

II. Procedure

- Brachytherapy can be delivered in an out-patient setting.
- Hospitalisation may be required if surgical operation is necessary, depending on the methods of brachytherapy delivery and the site receiving the radiation.
- Anaesthetic procedures, including general anaesthesia, spinal anaesthesia, or local anaesthesia would be applied as appropriate.
- Brachytherapy treatment applicators/catheters are temporarily inserted directly into a tumour or nearby body cavity, or a cavity close to the tumour.

- Image scanning (X-ray/CT/MRI) will be done for target localisation before dose calculation and treatment.
- You will then stay in the treatment room alone while brachytherapy is being delivered. The radioactive source would be driven to the treatment area for a precisely set time.
- You will be closely monitored through a closed-circuit television system.
- Each treatment session is quick and normally lasts less than 10-20 minutes.
- The entire brachytherapy treatment time depends on many factors like the location, type and size of the cancer. You may receive a single treatment or a treatment course consisting of several sessions for a period of one or more weeks.

III. Risks and Side Effects

- Risks of anaesthesia if the treatment is given under anaesthesia. Such risks will be explained by the anaesthetist or the doctor in charge.
- Brachytherapy is usually well tolerated with few side effects as it is focused on a smaller area.
- Side effects are generally specific to the area being treated and acute side effects may include some tenderness, swelling and inflammation in the treatment site, and sometimes mild bleeding in relation to the operation procedure. The side effects usually disappear within a few weeks.
- There may be localised pain when brachytherapy applicators are removed. Pain killers would be prescribed if needed.
- You will not become radioactive after treatment. There is no risk of retaining, or spreading radioactivity to your family members in the same household.
- Each patient reacts differently and may experience varying degrees of side effects. If you do notice any changes that are of concern, it is important for you to notify your treatment team.

Extremely rare risks and complications

- Depending on the treatment site, short-term serious complications that may possibly occur are: visceral perforation, bleeding, septicemia. Long-term complications include: tubular organ stricture, fistula formation, mucosal ulcers, soft tissue and/or bone necrosis, neuropathy, arterial blow-out or stenosis causing organ dysfunction or leading to death.

Note:

- Radiation-induced tumours may occur, but this is rare.
- The growth of irradiated areas may be affected in children.
- On rare occasions, patients may develop severe life-threatening complications due to radiotherapy and die.

- It is possible that the intended treatment outcome cannot be achieved, and the disease may not be alleviated or may recur/ progress in the future.
- Despite all precautions, unpredictable and unpreventable adverse outcomes may occur after treatment. Please kindly ensure that you understand the pros and cons of radiotherapy before deciding on undergoing the latter.

IV. Before the Treatment / Preparations Required

1. The treatment plan and brachytherapy schedule depend on the type and location of the tumour, as well as your health condition. Your doctor will discuss the details with you and explain how you can cope with the treatment side effects, and obtain a written informed consent from you.
2. Please be punctual for hospital admission if a surgical procedure in Operational Theatre is required, otherwise the operation may be cancelled.
3. Please follow the diet and bowel preparation according to instructions if applicable.
4. Our staff will take written, photographic and radiographic records of your treatment for radiotherapy planning and future reference. These records may be used for research or scientific publications but your confidentiality will be maintained at all times.

Note:

- **Radiotherapy can cause teratogenicity (i.e. lead to abnormal fetal development). During radiotherapy, both male and female patients (if applicable) should use an effective method of contraception.**
- **Radiotherapy may affect the function of your pacemaker. Please let us know if you have a cardiac pacemaker.**

V. After the Treatment

1. You may feel tired or experience other side effects with brachytherapy. Please consider having a friend or relative accompanying you to the hospital if possible.
2. Post-treatment hospitalisation may be required depending on the type of brachytherapy and site of treatment.
3. Our doctors will assess you on a regular basis and take appropriate measures to minimise your side effects.
4. If you feel unwell during the treatment period, please inform our staff.

VI. Follow-up

1. The time taken for recovery varies from person to person and type of brachytherapy,

- some people can go back to work shortly after the completion of treatment.
2. After completing the whole course of brachytherapy, a follow-up appointment will be arranged to assess your response to treatment and to look out for complications. Please attend your appointment as scheduled.
 3. Please ensure that you follow precisely the instructions given to you regarding medications (if applicable).

VII. Remarks

The list of complications is not exhaustive and other unforeseen complications may occasionally occur. The risk of some complications may actually be higher for certain patient groups. For further information, please contact your doctor.