



about
brachytherapy

BRACHYTHERAPY:

**THE PRECISE
ANSWER FOR
TACKLING
SKIN CANCER**

Treatment options

There are several options available to treat non-melanoma skin cancer (basal cell carcinoma and squamous cell carcinoma). These include:¹

- **Surgery**
- **Radiation therapy including External beam radiation therapy—radiation from outside in and Brachytherapy (interventional radiation therapy)—bringing the source of radiation close to the tumor**
- **Other therapies: destructive methods (cryosurgery), photodynamic therapy, topical medications, laser, chemotherapy**

The most common modality used for treating skin cancer is surgical excision.

There is, however, a subgroup of patients that are better treated with radiation therapy. Considerations of cosmetic and/or functional outcome and considerations of risks of surgical procedures might lead to the selection of radiation therapy as treatment of choice.²

Based on existing clinical evidence, the National Comprehensive Cancer Network (an alliance of the world's leading cancer centers) concluded that topical therapies such as creams and photodynamic therapy should only be considered if surgery and radiation therapy are not possible.² Radiation therapy, including brachytherapy, is a good alternative to surgery in cases where surgery is not possible, in cases where expected functional or cosmetic outcome would be better with radiation therapy than with surgery (forehead, ear, nose, scalp areas), and in elderly or frail patients.^{3,4,5,6}



Advantages and disadvantages of skin cancer treatments

Each treatment has advantages and disadvantages. These should be considered and discussed with your healthcare professional when planning your treatment.

Treatment	Advantages	Disadvantages
Surgery (such as excision and Mohs surgery)	<ul style="list-style-type: none">• High efficacy, margin control possible, single-day procedure.⁶	<ul style="list-style-type: none">• Healthy tissue is also removed.• Often restriction of activity to allow wound healing.• Scarring.• Often need for reconstructive procedures.• Risk of wound healing complications.
External beam radiation therapy (EBRT)	<ul style="list-style-type: none">• Non-invasive, painless.• Efficacy is comparable to surgery. Allows patient to continue taking prescribed medications.⁷	<ul style="list-style-type: none">• The treatment course can be long (4–6 weeks). Not suitable for all patient groups.⁶
Brachytherapy	<ul style="list-style-type: none">• High efficacy, excellent functional and cosmetic outcomes. Allows patients to continue taking prescribed medications.• Less fractions than EBRT course (2–3 times a week, rather than daily), which translates into fewer treatment visits for a patient, particularly useful for elderly and frail patients.³	<ul style="list-style-type: none">• Not available at all hospitals.• Multiple (usually 6–8) fractions.• Can be invasive depending on the brachytherapy technique.
Other therapies	<ul style="list-style-type: none">• Often noninvasive; safe and effective alternative to traditional treatment.⁸	<ul style="list-style-type: none">• Not suitable for all patients: factors such as tumor location, size, and cell type should be taken in consideration.• More studies are required to prove the efficacy of treatment.

Types of brachytherapy that can be used for treatment of this cancer type

Brachytherapy delivers the radiation with a high degree of precision. This accuracy allows positioning and the calculation of the depth of irradiation so that healthy tissue is spared while the tumor gets a high dose of radiation¹. This increases efficacy and minimizes damage to healthy surrounding tissues.

Superficial brachytherapy involves molds (often custom-made) and flaps for larger lesions, and radionuclide or electronic based shielded applicators for small volume lesions. Interstitial brachytherapy is applied to more deeply located and/or very irregular shaped tumors.¹ Brachytherapy provides good cosmetic results and has also been shown to be highly effective in preventing the skin cancer from returning. When compared to external beam radiation therapy, which places the source at a distance, brachytherapy reduces the amount of radiation to healthy tissues and can be delivered in a much shorter treatment time.¹⁻³

Basal cell and squamous cell cancers that have not spread to other parts of the body can be treated effectively with brachytherapy. Absolute contraindications for brachytherapy in skin cancer are invasion of bones, some genetic diseases like xeroderma pigmentosa, and extension of the tumor in the orbit and perineural invasion.

Two types of brachytherapy are currently available for skin cancer¹

Superficial, also called contact brachytherapy.

Interstitial, with the insertion of plastic tubes or rigid needles.



How brachytherapy for this cancer type is performed

There are three main stages to the brachytherapy procedure: planning, treatment delivery and post-procedure monitoring.

Planning

The planning stage involves a thorough examination of the skin cancer and surrounding area.

Ultrasound and/or biopsy may be used to gain an accurate picture of the layers of the skin and the precise position and thickness of the tumor.

The doctor calculates the amount of radiation needed to treat the cancer and where the radiation should be placed over the skin. In some cases, especially with larger lesions or lesions on a very irregular surface, a mold of the skin may be taken. This enables the brachytherapy team to create a custom-made device to accurately place the radiation on the skin.

Radiation delivery

The applicators are connected to an afterloader, a computer controlled machine which controls the duration of exposure to the source of radiation.

This source of radiation may either be a small x-ray source (in case of electronic brachytherapy), or a radioactive isotope (isotope-based brachytherapy). When treatment is ready to start, your doctor will press a start button and the treatment unit will automatically apply the correct dose of radiation exactly to the skin cancer lesion. The accurate positioning of the shielded applicator reduces the risk of healthy surrounding tissues or organs being damaged by the radiation.

Superficial brachytherapy is a painless procedure and can be carried out without an anesthetic. Treatment delivery usually lasts only a couple of minutes per session, after which a patient can return immediately to his or her daily life.

For lesions with depth greater than 5 mm and/or the tumor is in curved surfaces as in the face, an interstitial brachytherapy is indicated. The implantation procedure requires general or local anesthesia. Often the flexible implant tubes are inserted and secured by fixation buttons or sutured to the skin.



Post-procedure monitoring

A follow-up appointment will be scheduled a few weeks after the last fraction has been delivered.

This appointment is to check that the treatment is going well and to monitor for any possible side effects. Typically follow-up visits are scheduled every 3–6 months for the first year and thereafter once per year.⁹ This schedule of follow-up does not depend on the type of therapy for skin cancer but is a general procedure when patients have had skin cancer. Patients are also recommended to regularly screen their skin for new lesions, since the risk of developing new skin cancers is significantly higher after having had a first skin cancer lesion.

What are the potential advantages of brachytherapy?

- Brachytherapy is a **very effective and highly convenient** treatment for skin cancer
- Multiple studies have shown brachytherapy to be **highly effective for the treatment of nonmelanoma** skin cancer¹⁻⁶
- Excellent cosmetic outcome, **side effects are minimal** and up to 100% of patients report an excellent or good cosmetic outcome¹⁻⁶
- **Avoidance of surgery**⁷; no cutting, no need for extensive wound care, no risk of bleeding or other wound complications, no surgical scars
- **Noninvasive** and virtually painless procedure (in case of superficial brachytherapy), minimal impact on the patient's quality of life^{4,5}
- **Short treatment times**, fractions are usually delivered within minutes¹

Side effects of brachytherapy

All treatments for skin cancer carry a risk of side effects

People respond to treatments in different ways. Some side effects may appear in the short term (known as acute side effects), others may appear several months later (long-term side effects). Brachytherapy is well tolerated by most patients and the risk of long-term side effects is very low.¹

Short-term (acute) side effects

As with all treatments, you may experience some side effects immediately after the treatment procedure. After brachytherapy, you may experience some of the following:^{1,2,3}

- **Mild erythema (redness/rash)**
- **Dry or moist desquamation, moderate edema**

These short-term side effects are typically mild in nature and usually resolve within 2 weeks after treatment.

Long-term side effects

In the majority of cases, the area of skin being treated will return to normal appearance after a few weeks. With brachytherapy, as with other treatments, some long-term side effects may be experienced. Long-term side effects that may appear after brachytherapy:^{1,2,3}

- **A slight mark or discoloration (either hypo- or hyperpigmentation) of the skin at the area of radiation therapy may occur**
- **Local hair loss at the site of radiation**

Discuss your treatment options and the relative risks of potential side effects with your healthcare professional.

How effective is brachytherapy in treating skin cancer?

Brachytherapy is a very effective treatment option for skin cancer. Complete response is seen in >95% of patients.^{1,3} This is comparable with surgical excision.

Will the brachytherapy procedure hurt?

Superficial brachytherapy itself is painless. Only in cases where doctors decide that invasive procedures are required for optimal outcome can anesthesia be applied.

If I have brachytherapy, do I have to stay in hospital overnight?

Treatment is usually given on an outpatient basis. Standard brachytherapy procedures for treating skin lesions do not require hospitalization.

How will I know if brachytherapy has worked?

After your procedure, you will be scheduled regular appointments to check that the tumor is responding to the treatment. Based on clinical experience, a complete response is expected in more than 95% of all patients.^{1,3}

What are the side effects of brachytherapy?

All treatments for skin cancer carry a risk of side effects. Immediately after the brachytherapy treatment, a redness or rash may appear on the skin. This usually resolves within a couple of weeks after finalizing the treatments. For more information read the side effects section.

Will I be left with any scars?

In the majority of cases, the area of skin being treated with brachytherapy will return to normal appearance after a couple of weeks. In some cases a slight mark or discoloration of the skin may occur.

How soon can I get back to work after receiving brachytherapy?

The recovery time after brachytherapy for skin cancer is usually very short. You can probably return to your normal daily routine immediately after treatment.

Treatment options

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FAQs

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