**Perspective**
Volume 7:2, 2022

Journal of Oncology Medicine & Practice

ISSN: 2576-3857 Open Access

# Brachytherapy: An Overview

**Nazima Begum***

*Department of Pediatrics Oncology, The Gujarat Cancer Society, Gujarat, India*

## Introduction

Brachytherapy is a type of radiation therapy that involves placing a sealed radiation source inside or adjacent to the area that has to be treated. Brachy is a Greek word that means "short." Brachytherapy is a popular treatment for cervical, prostate, breast, esophageal, and skin cancers, but it can also be used to treat tumours in other parts of the body. The cancer-cure rates of brachytherapy are either comparable to surgery or external beam radiotherapy (EBRT) or better when used in combination with these treatments, according to treatment results. Surgery, EBRT, and chemotherapy are all examples of treatments that can be combined with brachytherapy. Brachytherapy differs from unsealed source radiation, which involves injecting a therapeutic radionuclide (radioisotope) into the body and chemically localising it to the tissue that has to be destroyed.

## Description

External Beam Radiation Therapy (EBRT) is a type of radiation therapy in which high-energy x-rays (or occasionally gamma-rays from a radioisotope like cobalt-60) are aimed at the tumour from outside the body. Brachytherapy, on the other hand, entails the precise placement of short-range radiation sources (radioisotopes such as iodine-125 or cesium-131, for example) directly at the diseased tumour. These are contained within a protective capsule or wire that permits ionising radiation to escape to treat and kill nearby tissue while preventing the radioisotope's charge from migrating or dissolving in human fluids [1]. The capsule can be removed afterwards or left in place (in the case of some radioisotopes). The fact that the irradiation only affects a small area around the radiation sources is a distinguishing aspect of brachytherapy. Radiation exposure of healthy tissues further distant from the sources is thus minimised [2].

Furthermore, the radiation sources maintain their correct position in relation to the tumour if the patient moves or if the tumour moves within the body during treatment. These features of brachytherapy make it superior to EBRT in that the tumour can be treated with very high doses of targeted radiation while avoiding undue damage to adjacent healthy tissues. A course of brachytherapy can be completed in less time than other types of treatment. This may minimise the chances of surviving cancer cells dividing and growing in the time between radiotherapy treatments. In comparison to EBRT, patients often require fewer visits to the radiotherapy clinic and may be treated as outpatients. For many patients, this makes treatment more accessible and convenient [3].

Because of these characteristics of brachytherapy, the technique is well tolerated by the majority of patients. In 2013, the global brachytherapy market was worth $680 million, with the high-dose rate (HDR) and low-dose rate (LDR) segments accounting for 70% of the total. The remaining 30% was made up of microspheres and electronic brachytherapy. According to one estimate, the brachytherapy industry will be worth over US$2.4 billion in 2030, rising at an annual rate of 8%, driven mostly by the microspheres market and electronic brachytherapy, which is gaining popularity worldwide as a user-friendly technique. Cancers of the cervix, prostate, breast, and skin are all regularly treated using brachytherapy. Brachytherapy can be used to treat tumours in the brain, eye, head and neck region (lip, floor of mouth, tongue, nasopharynx and oropharynx), respiratory tract (trachea and bronchi), digestive tract (oesophagus, gall bladder, bile-ducts, rectum, anus), urinary tract (bladder, urethra, penis), female reproductive tract (uterus, vagina, vulva), Brachytherapy allows a high dosage of radiation to be delivered to a small area since the radiation sources may be precisely positioned at the tumour treatment site.

Furthermore, because the radiation sources are positioned in or near the target tumour, they maintain their position in relation to the tumour as the patient moves or the tumour moves within the body. As a result, the radiation sources are precisely targeted. This allows oncologists to obtain a high level of dose conformity, or ensuring that the entire tumour receives the appropriate amount of radiation. It also decreases the danger of harming healthy tissue, organs, or structures in the vicinity of the tumour, improving the chances of cure and maintaining organ function. When compared to EBRT, HDR brachytherapy allows for shorter overall treatment times. Patients who receive brachytherapy have fewer radiotherapy appointments than those who receive EBRT, and their treatment programmes can be finished in less time.

Many brachytherapy treatments are done as outpatient procedures [4]. This convenience may be especially important for patients who have to work, are older, or live a long distance from treatment centres in order to ensure that they receive radiation treatment and follow treatment programmes [5]. Shorter treatment periods and outpatient procedures can also help radiotherapy facilities run more efficiently. Brachytherapy can be used to cure cancer in cases when the tumour is tiny or locally progressed, as long as the cancer has not spread (spread to other parts of the body).

Brachytherapy for primary tumours is typically a comparable technique to surgery in appropriately selected situations, achieving the same likelihood of cure and with similar adverse effects. Surgery, on the other hand, may not always provide the best chance of treatment in locally advanced tumours and is frequently not physically viable. Radiotherapy, including brachytherapy, is the only treatment option in many instances. The use of brachytherapy in conjunction with chemotherapy is uncommon. Brachytherapy is a standard of care in many countries for the treatment of early or locally limited cervical cancer. LDR, PDR, or HDR brachytherapy can be used to treat cervical cancer. Brachytherapy, when used in conjunction with EBRT, can produce better results than EBRT alone.

Brachytherapy allows a high dosage of focused radiation to be delivered to the cervix while minimising radiation exposure to nearby tissues and organs due to its precision. For LDR, PDR, and HDR therapies the probability of being disease-free (disease-free survival) and remaining alive (overall survival) are identical. However, one of the major benefits of HDR treatment is that each dose can be given as an outpatient procedure with a short administration time, which makes it more convenient for many patients. Locally advanced cervical carcinoma must be treated with a combination of external beam radiation (EBRT) and intracavity brachytherapy, according to research (ICBT).

## Conclusion

Brachytherapy can be utilised as a palliative treatment for symptom reduction from pain and bleeding in advanced illness stages. Brachytherapy

***Address for Correspondence:** Nazima Begum, Department of Pediatrics Oncology, The Gujarat Cancer Society, Gujarat, India, E-mail: Begum .n@hotmail.com*



**Date of Submission:** 05 April, 2022, Manuscript No. jomp-22-56609; **Editor Assigned:** 10 April, 2022, PreQC No. P-56609; **Reviewed:** 21 April, 2022, QC No. Q-56609; **Revised:** 25 April, 2022, Manuscript No. R-56609; **Published:** 31 April, 2022, DOI: 10.37421/2157-7145.2022.7.155

can be combined with other treatments, such as EBRT and/or surgery, in cases when the tumour is difficult to reach or too large to ensure an adequate distribution of irradiation to the treated area.

## References


1. Skowronek, Janusz. "Current status of brachytherapy in cancer treatment-short overview." *J Contemp Brachyther* 9 (2017):581-589.
2. Han, Kathy, Michael Milosevic, Anthony Fyles and Melania Pintilie, et al. "Trends in the utilization of brachytherapy in cervical cancer in the United States." *Int J Radiat Oncol Biol Phys* 87 (2013):111-119.
3. Gill, Beant S., Jeff F. Lin, Thomas C. Krivak and Paniti Sukumvanich, et al. "National Cancer Data Base analysis of radiation therapy consolidation modality for cervical cancer: the impact of new technological advancements." *Int J Radiat Oncol Biol Phys* 90 (2014): 1083-1090.
4. Hoskin, Peter J., Ana M. Rojas, Peter J. Bownes and Gerry J. Lowe, et al. "Randomised trial of external beam radiotherapy alone or combined with high-dose-rate brachytherapy boost for localised prostate cancer." *Radiother Oncol* 103(2012): 217-222.
5. Dayes, Ian S., Sameer Parpia, Jaclyn Gilbert and Jim A. Julian, et al. "Long-term results of a randomized trial comparing iridium implant plus external beam radiation therapy with external beam radiation therapy alone in node-negative locally advanced cancer of the prostate." *Int J Radiat Oncol Biol Phys* 99 (2017):90-93.


**How to cite this article:** Begum, Nazima. "Brachytherapy: An Overview" J Oncol Med & Pract 7 (2022): 155.