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COMMENTARY

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Medical uses of Radiation Therapy and its Types

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Description

Radiation therapy or radiotherapy, often abbreviated RT, RTx or XRT, is a therapy using ionizing radiation, generally given as part of cancer treatment to control or kill malignant cells and normally delivered by a linear accelerator. Radiation therapy is commonly applied to a cancerous tumor because of its ability to control cell growth. Ionizing radiation works by damaging the DNA of cancerous tissue, leading to cell death. To spare normal tissues (such as skin or organs through which radiation must pass when treating a tumor), shaped beams of radiation are directed from multiple exposure angles to intersect in the tumor and deliver a much higher absorbed dose there than in the surrounding healthy tissue. . In addition to the tumor itself, the radiation field may also include the draining lymph nodes if they are clinically or radiologically associated with the tumor, or if there is a suspected risk of subclinical malignant spread. It is necessary to include a margin of normal tissue around the tumor to allow for uncertainties in diurnal setting and internal tumor motion. These uncertainties may be due to internal motion (for example, breathing and bladder filling) and motion of external skin markers relative to tumor position.

Medical uses

Different types of cancer respond to radiation therapy in different ways.The response of cancer to radiation is described by its radiosensitivity. Highly radiosensitive cancer cells are quickly killed by moderate doses of radiation. These include leukemia, most lymphomas, and germ cell tumors. Most epithelial cancers are only moderately radiosensitive and require a significantly higher dose of radiation (60-70 Gy) to achieve a radical cure [1]. Some types of cancer are remarkably radioresistant, that is, much higher doses are needed for a radical cure than can be safely done in clinical practice. Renal cancer and melanoma are generally considered radioresistant, but radiation therapy is still a palliative option for many patients with metastatic melanoma. Combining radiation therapy with immunotherapy is an active area of investigation and has shown promise for melanoma and other cancers [2].

It is important to distinguish the radiosensitivity of a specific tumor, which is to some extent a laboratory measurement, from the radiation "treatability" of a tumor in current clinical practice. For example, leukemias are generally not treatable with radiation therapy because they spread throughout the body. Lymphoma can be radically curable if it is localized in one area of the body. [3] Similarly, many common, moderately radioresponsive tumors are routinely treated with curative doses of radiation therapy if they are early stage. For example, non-melanoma skin cancer, head and neck cancer, breast cancer, non-small cell lung cancer, cervical cancer, rectal cancer and prostate cancer. Metastatic tumors are, with the exception of oligometastatic disease, untreatable with radiotherapy because it is not possible to treat the whole body [4].

Types of radiation therapy

External beam radiation therapy: With external beam radiation therapy, a large machine sends radiation waves to the cancer site from outside the body [5]. You cannot see the beams and the device does not touch you, but moves around you. Movement allows it to emit radiation from many different directions. Doctors use this type of radiation as a local treatment to target a specific part of your body. For example, when used for breast cancer, the radiation is focused only on your chest instead of your entire body [6].

Internal radiation therapy: Internal radiation therapy is performed in a variety of ways. With brachytherapy,

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your doctor may implant a radiation source into your body near the site of the cancer [7]. Radiation sources are often in the form of ;

- capsules
- ribbons
- seeds
- balloons
- wires
- pipes
- liquid

This process usually takes place in the operating room to contain the radiation. Doctors and technicians usually use imaging tests to make sure the implant is going where it needs to be [8].

References

[1] Maverakis E, Cornelius LA, Bowen GM, Phan T, Patel FB, Fitzmaurice S, et al. Metastatic melanoma : A review of current and future treatment options. Acta Derm Venereol.2015.

[2] Darby S, McGale P, Correa C, Taylor C, Arriagada R, Clarke M, et al. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: Meta-analysis of individual patient data for 10 801 women in 17 randomised trials. Lancet. 2011;378(9804):1707-16.

[3] Reyngold M, Parikh P, Crane CH. Ablative radiation therapy for locally advanced pancreatic cancer: Techniques and results. Radiat Oncol. 2019;14(1):1-8.

[4] Mahmood SS, Nohria A. Cardiovascular complications of cranial and neck radiation. Curr Treat Options Cardiovasc Med. 2016;18(7):1-0.

[5] Lee VH, Ng SC, Leung TW, Au GK, Kwong DL. Dosimetric predictors of radiation-induced acute nausea and vomiting in IMRT for nasopharyngeal cancer. Int J Radiat Oncol Biol Phys. 2012 ; 84(1):176-82.

[6] Karamanolis G, Sgouros S, Karatzias G, Papadopoulou E, Vasiliadis K, Stefanidis G, et al. Long-term outcome of pneumatic dilation in the treatment of achalasia. Am J Gastroenterol. 2005;100(2):270-4.

[7] Murthy R, Brown DB, Salem R, Meranze SG, Coldwell DM, Krishnan S, et al. Gastrointestinal complications associated with hepatic arterial Yttrium-90 microsphere therapy. J Vasc Interv Radiol. 2007;18(4):553-61.

[8] Kamran SC, Berrington de Gonzalez A, Ng A, Haas-Kogan D, Viswanathan AN. Therapeutic radiation and the potential risk of second malignancies. Cancer. 2016;122(12):1809-21.