Editorial
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Radiation Oncology: A Great Treatment for Cancer Patients

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Being diagnosed with cancer can be a devastating experience. In the midst of this crisis, it would be heartening to be in the hands of a professional, well qualified, experienced and sympathetic health provider. Health providers from several specialties form a team to give cancer patients the best chance for a good quality, normal, long life. Radiation oncology is one specialty that uses ionizing radiation as the main modality of treatment. Over the past century, radiation oncology has made remarkable achievements in the management of malignant and some benign tumors. In many countries (but not the United States), radiotherapy and chemotherapy are controlled by a single oncologist who is a "clinical (radiation) oncologist". Radiation oncologists work closely with other physicians, such as surgical oncologists, surgeons, internal medicine subspecialists and medical oncologists, as part of a multi-disciplinary cancer team.[1]

The advent of radiation oncology began not long after the discovery of X-ray by the German physicist Wilhelm Roentgen in 1895. In fact, the potential role of X-rays as a therapeutic tool was quickly realized. Emil Grubbe, a medical student in Chicago, noted dermatitis of his hands and neck because of exposure to X-ray. Having this effect in mind, he irradiated a cancer patient who suffered from locally advanced breast cancer. Doing so, he became the first radiation oncologist.[2] Shortly thereafter Claude Regaud, a physician in Paris, recognized that treatment was better tolerated and more effective when delivered slowly, with modest doses per day over a longer time. This method, known as fractionation, has remained one of the most important principles in radiation therapy.

In the early years of the advent of radiation therapy a limitation of early X-ray machines was their inability to generate high energy, deeply penetrating beams. Thus, irradiating deep seated tumors without serious side effects was not possible. One solution to this problem was to put the source of radioactive materials in close proximity or within the tumor. This method, known as brachytherapy, has been a main route of delivery of radiation for many tumors such as cancer of the uterine

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cervix. After radioactive isotope machines (i.e., the cobalt 60 unit), and with the knowledge that higher energy beams were more penetrating, thus improving the effect of radiation in treating deep-seated tumors efforts to produce more powerful devices led to construction of the linear accelerator.

As with the rapid growth of diagnostic radiology worldwide, radiation oncology has also grown during the past two decades. The advent of new imaging technologies, such as magnetic resonance imaging (MRI) has moved radiation therapy to intensity-modulated radiation therapy (IMRT) and image-guided radiation therapy (IGRT). A newly developed method of IGRT named tomotherapy is a hybrid between a CT imaging scanner and an external-beam radiation therapy machine.[3] The part of the tomotherapy machine that delivers radiation for both imaging and treatment can rotate completely around the patient in the same manner as a normal CT scanner. These advances allow radiation oncologists to better locate and irradiate tumors, resulting in better treatment outcomes with fewer side effects. These methods enable the radiation oncologist to irradiate a deep-seated tumor with a higher dose of radiation compared with conventional two-dimensional radiotherapy. With various modifications, they are particularly helpful for deep-seated tumors in the pelvis and abdomen.[4] Investigations and the invention of new devices and methods have even led to re-irradiation of some recurrent tumors. [5]

Once radiation treatment has ended, regardless of the technique used, follow-up continues by the radiation oncologist and is dependent upon the nature of the malignancy.

In Iran, the first megavoltage radiotherapy device (cobalt 60) was installed in Tehran, followed by other cities. Training in the specialty of radiation oncology was established in 1966 in Tehran at Shahid Beheshti University[6] and started by specialists who had been graduated from the United States, England and other European countries. Because most pioneers of radiation oncology in Iran had been graduated from Britain, this specialty, as in the U.K, control chemotherapy for the treatment of solid tumors too. Recently, high energy linear accelerators have been installed in many centers in Iran, enabling radiation oncologists who are at the heart of the multidisciplinary team for cancer treatment to treat cancer patients with new methods of radiation therapy. These oncologists are consulted for diagnosis, management and follow-up of cancer patients.

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