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Commentary: Radiotherapy Innovations-New Horizons for Cancer Care

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Commentary

It is estimated that half of patients diagnosed with cancer will receive radiation through the course of their life [1]. Over the past few decades, the radiation oncology field experienced fascinating improvements in the way we plan, delivery and assess radiotherapy treatments [2]. These advancements allowed radiotherapy to be more accurate in targeting tumor, while sparing nearby normal tissues. For example, defining gross tumor volume (GTV) has been dramatically revolutionized, from the use of skin-based contouring to sophisticated CT-based approach with integrated 4D, MRI and PET-CT fusion capabilities [3]. This is not limited to target definition, but extended to account for organ motion, nowadays respiratory gating and 4D-cone beam CT allow physicians to visualize tumor motion during treatment and minimize radiation to normal tissues [4].

Radiotherapy is conventionally delivered in multiple small doses; the aim of this approach is to control the disease while minimizing harm to surrounding organs. Interestingly, radiobiology and clinical studies have shown that small number of radiation sessions (1-5 sessions) with large radiation dose and image guidance/localization can be equivalent or even more effective in cancer outcomes (e.g. local control), though it may need specific clinical and physical expertise. This regimen, known as stereotactic radiation, has evolved dramatically in the recent years with many institutions using different machines and technologies to deliver high ablative dose in an extremely precise way aiming to reduce side effects while achieving great control rates. Stereotactic radiotherapy is currently validated clinically in many tumor sites, for example in lung cancer, spine and brain metastases [5,6]. The main advantage of stereotactic radiation is the high rates of local control associate with potential to cure in the oligometastases setting. In addition, convenience, for both the patient and treating staff, as radiation can be completed in a week [7].

Radiation delivery is dependent on the equipment and technologies mounted on those machines. In the past cobalt radioactive units were commonly used in radiation treatment. Nowadays, linear accelerators (Linacs) have taken place. Linacs have the ability to provide unique field outlines along with different beam energies, allowing the delivery of Intensity Modulated Radiotherapy (IMRT) and Volumetric Arc Therapy (VMAT) [8], which are the cutting-edge forms of radiation delivery. A variety of machines are now available with diverse specifications. Cyber knife, gamma-knife, MRI-Linacs, proton and heavy ion machines are some forms of evolution achieved in radiotherapy along the years [9].

The dynamic innovations in radiation oncology add important clinical advantages for the patients, but on the same time it adds challenges for the radiation oncologists. They should try hard to offer their patients the best available technologies and provide a clinical research to meet this technological improvement. Yes, this comes with expensive cost, but there is no improvement without investments.

References

1. DeVita VT, Lawrence TS, Rosenberg SA (2014) DeVita, Hellman, and Rosenberg's Cancer: principles and practice of oncology. (10th edn), Lippincott Williams and Wilkins, Philadelphia, USA.
2. Glatstein E (2002) Intensity-modulated radiation therapy: The inverse, the converse, and the perverse. Semin Radiat Oncol 12(3): 272-281.
3. Citrin DE (2017) Recent developments in radiotherapy. N Engl J Med 377: 1065-1075.
4. Munshi A, Agarwal JP (2010) Evolution of radiation oncology: Sharp gun, but a blurred target. J Cancer Res Ther 6(1): 3-4.

5. Rosenzweig KE, Sura S, Jackson A, Yorke E (2007) Involved-field radiation therapy for inoperable non small-cell lung cancer. J ClinOncol 25(35): 5557-5561.

6. Sahgal A, Aoyama H, Kocher M, Neupane B, Collette S, et al. (2015) Phase 3 trials of stereotactic radiosurgery with or without whole-brain radiation therapy for 1 to 4 brain metastases: individual patient data meta-analysis. Int J Radiat Oncol Biol Phys 91(4): 710-717.

7. Chang JY, Senan S, Paul MA, Mehran RJ, Louie AV, et al. (2015) Stereotactic ablative radiotherapy versus lobectomy for operable stage I non-small-cell lung cancer: a pooled analysis of two randomised trials. Lancet Oncol 16(6): 630-637.

8. Teoh M, Clark CH, Wood K, Whitaker S, Nisbet A, et al. (2011) Volumetric modulated arc therapy: a review of current literature and clinical use in practice. Br J Radiol 84(1007): 967-996.

9. Thariat J, Bolle S, Demizu Y, Marcy PY, Hu Y, et al. (2011) New techniques in radiation therapy for head and neck cancer: IMRT, Cyber Knife, protons, and carbon ions. Improved effectiveness and safety? Impact on survival. Anticancer Drugs 22(7): 596-606.

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