EDITORIAL

The promise and challenges of proton therapy

John Suh, MD, Editor in Chief

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Welcome to the first-quarter edition of Applied Radiation Oncology 2013! I hope everyone has fully recovered from various holiday festivities and is keeping up with their New Year's resolutions thus far.

In this edition, one of our articles deals with the promise of proton therapy, an emerging and expensive treatment option for cancer patients. Given its high acquisition and current treatment costs, and large space requirements, its potential promise has been under scrutiny, especially given the lack of prospective trials demonstrating clear benefit over other less expensive radiation treatment options that are available.

The keen interest in proton therapy is based on theoretical advantages, which include the precise delivery of radiation at a depth in the body using a spread out Bragg Peak (SOBP). This can reduce exposure to normal tissue and possibly minimize side effects. Unfortunately, little consensus exists on whether the dosimetric advantages translate to better outcomes, except for pediatric cancers, and skull base and sacral tumors. Currently, protons are used for a number of cancers, including brain, prostate, lung, esophagus, breast, and head and neck.

As we move toward comparative effectiveness research, value-based medicine, care paths, and emphasis on continuum of care, the value and benefit from protons will undergo additional scrutiny. Despite these concerns, acquisition of this technology has continued to increase. This so-called "medical arms race" by major medical centers and institutions to offer patients the latest in radiation oncology technology has greatly heightened the perception and expectations of this treatment. Since the initial costs are roughly twice that of conventional radiation treatment options, the costs associated throughout a patient's lifetime need to be factored in to help make the case for protons. Ultimately, prospective, randomized studies comparing proton therapy to intensity-modulated radiation therapy need to be completed to provide level I evidence that supports or refutes the wider adoption of protons.

In the future, the development of compact units, which are less expensive and have smaller footprints, may provide sufficient cost savings and increase its overall value, thus improving accessibility to more patients. The incorporation of intensity-modulated proton therapy (IMPT) should help optimize the therapeutic ratio, enhance efficiencies, and allow for hypofractionation, which should further drive down costs and augment the value proposition for protons.

In my opinion, it is important that current and future users of this technology participate in clinical trials, apply this treatment modality judiciously, and conduct treatment and follow-up that can assess the true value of this therapy to patients and society. This will allow proton therapy to more fully reach its potential as a valuable and effective treatment to help fight cancer. .

Sincerely,

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