Medical Xpress

Image guided radiation therapy is commonly used to ensure accuracy in treating pediatric tumors

October 17 2014

Image guided radiation therapy (IGRT) is a commonly used modality to ensure treatment accuracy in the management of pediatric tumors; however, consensus recommendations are needed in order to guide clinical decisions on the use of IGRT in treating pediatric patients, according to a study published in the September-October 2014 issue of *Practical Radiation Oncology* (*PRO*), the official clinical practice journal of the American Society for Radiation Oncology (ASTRO).

IGRT is the process of using frequent imaging, typically performed in the treatment room prior to radiation delivery, throughout a patient's course of radiation therapy treatment to improve localization of the target and normal structures, which allows for more precise and accurate radiation delivery. IGRT is a common practice in both photon (traditional radiation therapy) and proton therapy to treat tumors close to sensitive structures and organs or in areas of the body prone to movement or change in shape.

This study, "Practice patterns of photon and proton pediatric image guided radiation treatment: Results from an International Pediatric Research Consortium," evaluates the use of IGRT in treatment planning for pediatric cancers in an international consortium comprised of seven institutions using either photon or proton therapy with dedicated pediatric expertise. Choosing optimal IGRT regimens that spare healthy tissue and organs is a particular concern for pediatric patients to help

prevent potential late effects associated with the distribution of the radiation dose and the total radiation dose the patient receives.

Nine international institutions were selected to participate in the consortium and were sent a 53-item survey comprised of mixed dichotomous, rank order, constant sum and open-ended questions to evaluate patterns of IGRT use in definitive radiation therapy for patients ≤21 years old. Seven of the nine institutions completed the survey. The seven institutions treated a total of approximately 750 pediatric patients, on average, per year. Five institutions use photon therapy alone, one uses proton therapy alone and one uses both photon and proton therapy.

Among the seven sites, an estimated 623 patients were treated with photon therapy annually and up to 133 patients were treated with proton therapy annually. The central nervous system (CNS) was the most frequent treatment site at four of the seven institutions, comprising 25 to 65 percent of treated cases across the facilities. The two facilities using proton therapy most commonly treated CNS and head and neck cancers.

Both proton facilities used kV-planar IGRT in 100 percent of proton cases. One photon facility used IGRT in 100 percent of cases, and IGRT use in the other photon facilities varied. At all seven sites, IGRT was used in 90 to 100 percent of CNS cases and in 100 percent of head and neck cases. IGRT use was inconsistent in abdomen or pelvis site treatment, ranging from 20 to 100 percent of cases across the seven facilities.

IGRT use also varied across consortium facilities depending on tumor type. All seven institutions used IGRT for treatment of ependymoma (cancer of the tissue of the brain or spinal cord), abdominal and pelvic sarcoma, and rhabdomyosarcoma (cancer of the muscles attached to the bones). Five facilities implemented IGRT for management of medulloblastoma, neuroblastoma and extremity sarcoma.

Half of the consortium institutions used IGRT on a daily basis when treating CNS, abdominal and pelvic, and head and neck sites. Four institutions used a different IGRT dose protocol for pediatric patients than for adult patients. Of those facilities that implemented a pediatric dose protocol, only one varied the dose protocol for different age groups within the pediatric population. Five consortium institutions cited image quality as the most important consideration when using IGRT for pediatric patients; one facility reported dose minimization as the primary consideration; and one facility reported both considerations were of equal importance.

"This study draws attention to the common consensus that the use of low-dose CT scans for image guidance for children is important for quality treatment and to ensure treatment accuracy," said Stephanie A. Terezakis, MD, co-author of the study and assistant professor of radiation oncology and molecular radiation sciences at Johns Hopkins Sidney Kimmel Comprehensive Cancer Center in Baltimore. "There was variation in the way the physicians at the consortium institutions were determining the treatment field, particularly in different sites of the body. This data provides us with valuable treatment patterns that can help us determine a standard or best practice that all institutions can apply for the same technique, which will improve the quality of care for children."

Provided by American Society for Radiation Oncology

Citation: Image guided radiation therapy is commonly used to ensure accuracy in treating pediatric tumors (2014, October 17) retrieved 2 May 2024 from https://medicalxpress.com/news/2014-10-image-therapy-commonly-accuracy-pediatric.html