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Radiation therapy in the last month of life☆

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ABSTRACT

Aim: We sought to survey a large, multi-center patient sample to better characterize/quantify RT utilization at the end of life.
Background: Few objective data exist for radiation therapy (RT) delivery at end of life (EOL).
Materials and methods: Data were retrieved for all patients receiving RT in calendar year 2010 in the Department of Radiation Oncology at Indiana University (IU) and Howard University (HU) hospitals. Specific attention was made of the group of patients receiving RT in the last 30 days of life.
Results: A total of 852 patients received all or part of their RT during 2010 (HU: 139, IU: 713). At time of analysis in early 2012, 179 patients had died (21%). Fifty-four patients (6.3% of total; 30% of expired patients) died within 30 days of receiving their last treatment. Twenty patients (2.3% of total; 11.2% of expired patients) received RT within their last week of life. For both sites, the median time until death from completion of therapy was 12.5 days (range 2–30 days).
Conclusions: Radiation in the last month of life is likely to provide minimal palliation or survival benefit. This, coupled with the financial implications, time investment, and physical costs, suggests that physicians and patients should more strongly consider hospice, and minimize duration of palliative RT courses as far as possible. As with chemotherapy, RT utilization at EOL should be considered for collection as an overuse metric.

1. Background

Much of the modern practice of radiation therapy (RT) is palliative. Despite this, there are remarkably few data describing RT at end-of-life (EOL).[1–5] With few national guidelines[6,7] to unify medical opinion on such practice, and minimal research describing efficacy of RT at EOL, it may be expected that there is a large variance in the treatment of terminally ill patients between different practices. In fact, one international survey suggested the existence of more than 100 different fractionation schemes used for patients treated with radiotherapy for bone metastases.[8]

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Hospice care aims to provide palliation of symptoms for patients whose expected disease course involves less than a 6 month life expectancy. Still, oncologists have sometimes been reluctant to refer patients for hospice consultation, and the average length of stay of oncology patients in hospice remains quite short.[9] ASCO's Quality Oncology Practice Initiative (QOPI)[10] has established a framework to guide management with chemotherapeutic agents in terminally ill patients. Chemotherapy provided within the last 2 weeks of life, as well as treatment courses initiated within 1 month of death are consistent with overutilization of chemotherapy. These practices were found to be associated with worse quality of life, with more intensive care unit admissions and more emergency department visits while failing to improve outcomes. One study compared a group of cancer patients including about 10% receiving chemotherapy at the EOL to another group of cancer patients containing 2% receiving EOL chemotherapy. The group with more EOL chemotherapy patients had a more than double rate of ICU admissions.[11,12] Additionally, patients randomized to a palliative care consult at the time of diagnosis with non-small cell lung cancer tended to receive less chemotherapy and had a greater life expectancy than those who did not.[13]

No similar comprehensive scales like QOPI currently exist for RT. While chemotherapy at the end of life has been declared to be overaggressive, RT continued into or initiated during this timeframe has not been clearly discouraged in a similar fashion. Admittedly, a single fraction of 8 Gy may provide significant palliation of bone pain; but longer fractionation schemes likely have minimal additional palliative effect and confer no increase in survival. Thus, it is critical to analyze existing RT practices in terminal patients.

2. Aim

We undertook a benchmarking analysis to report the frequency of RT utilization for patients at EOL.

3. Materials and methods

To create a diverse sample set of patients encompassing a wide distribution of diagnoses, socioeconomic status, and stages of disease, all patients treated with RT in the 2010 calendar year were included in our cross-sectional study. The Institutional Review Boards at IU and HU provided approval for this retrospective analysis to be performed at those sites.

Several assumptions were made in interpreting these data. First, we assumed that radiation oncologists treated patients with the belief that they would benefit from RT. In other words, we assumed that no one was delivered RT considered a priori to be futile. Secondly, we assumed that briefer courses, generally of larger daily fraction sizes, were more frequently palliative than curative. This is of course subject to amendment based on the histology being treated. Frequency of palliative vs. definitive RT, sites of treatment, and specifics of concurrent chemotherapy, hormonal therapy or antibiotic therapy were specifically assumed to be similarly distributed between these two tertiary care facilities over the period of an entire year.

Table 1 – Summary of patient data.

	IU	HU
Total patients	713	139
Expired within 30 days of RT	44/6.2%	10/7.2%
Expired within 7 days of RT	16/2.2%	4/2.9%
Definitive cases dying within 30 days	4	3
Causes	MI (2); sepsis; prog dz	MI, sepsis, unk
Aborted courses	12/1.7%	5/3.6%
Mean fx delivered/prescribed	4.5/10	19/30

IU, Indiana University; HU, Howard University.

Prior to data collection, the sample's scope was narrowed to deceased patients only, and then among those who had deceased, only those who had passed away within 4 weeks of RT were considered for further analysis. Outcomes of interest that were defined prior to analysis were survival time post-treatment, oncologic diagnosis, and intention of treatment. Outcomes explored after collecting data included treatment timeframes, and received vs. prescribed dosage.

Dates of death for deceased patients were retrieved from the Social Security Death Index, and the date of death compared with the recorded last day of RT. Patients expiring within 30 days of receiving radiation therapy were selected for further analysis.

4. Results

Data are tabulated in Table 1. Briefly, at IU, 713 total patients received RT in 2010, of which 142 (19.9%) had died at time of analysis (summer, 2012). Of these 142 deceased, 44 patients (31%) died within 1 month of their last treatment. Of all 713 RT patients at IU in 2010, 6% died within a month of receiving treatment. At HU, 37 of the 139 total patients (26.6%) had died at time of analysis; ten of those 37 (27%) died within 1 month of their last treatment. Of all 139 RT patients at HU in 2010, 7% died within a month of receiving RT. There were no deaths due to RT toxicity.

At IU, of the 44 patients dying within 1 month of their last treatment, 16 patients (36.4%) received RT within their last week of life. At HU, of the ten patients who had expired within 30 days of RT, four patients (40%) received RT during the last week of life. The median time until death from completion of therapy was 12.5 days (range 2–30 days) at IU; at HU it was 12 days (range 3–29 days).

Definitive cases were less likely to die within 30 days of treatment. Four IU patients died while receiving definitive therapy: one patient undergoing chemoradiation for vulvar carcinoma died of sepsis, another died of small cell lung cancer, and two died of myocardial infarction. Three HU patients died while receiving definitive therapy.

At IU, 10 of the patients treated within 1 month of death had RT halted prematurely for worsening performance status, after a median 4.5 fractions of 10 prescribed. At HUH, 4 EOL RT patients had RT halted prematurely for worsening performance status or for noncompliance, after a median