

REIRRADIATION AFTER RADICAL RADIATION THERAPY: A SURVEY OF PATTERNS OF PRACTICE AMONG CANADIAN RADIATION ONCOLOGISTS

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Purpose: The objective of this study was to survey the use of reirradiation (Re-RT) for in-field failures after previous radical radiation treatment (RT) among Canadian radiation oncologists (ROs).

Methods and Materials: An electronic survey was sent to 271 ROs in Canada. The completed surveys were received electronically via e-mail and the data were analyzed using SAS 9.1.3 software.

Results: A total of 183 ROs (67.5%) completed and returned the survey. The majority of the respondents were involved in the practice of either breast (48%) or genitourinary (43%) tumor sites. A total of 49% of the participants were interested in using Re-RT for the management of in-field recurrences. The goals of the therapy would be improvement of quality of life (99%), locoregional control (80%), or cure (32%). Most of the physicians believed that patients should have a minimum Karnofsky performance status of 50 or Eastern Cooperative Oncology Group performance status of 3, a minimum life expectancy of 3 months, and a minimum interval from initial treatment of 3 months if Re-RT were to be given with curative intent.

Conclusions: This survey showed that a wide variation existed among ROs in their approach to Re-RT. Newer technologies in RT planning and delivery would be employed to facilitate normal tissue avoidance. The results of this study suggested that a consensus meeting was needed to establish guidelines for the practice and prospective evaluation of Re-RT. © 2008 Elsevier Inc.

Reirradiation, Retreatment, In-field recurrence, Salvage treatment.

INTRODUCTION

The management of cancer recurrence in heavily irradiated tissues represents a challenging therapeutic problem in terms of choice of treatment modality that will improve and maintain quality of life. The incidence of in-field recurrence varies between 7% and 50% (1–5). It is significantly influenced by factors such as the primary tumor site, the initial tumor stage, type of treatment received, and the response to initial treatments (6).

Conventional treatment options for in-field recurrence include surgery, systemic chemotherapy, and reirradiation (Re-RT), whereas novel modalities such as cryosurgery and radiofrequency ablation are investigational (7). Re-RT is offered either with a curative intent or to palliate symptoms and improve quality of life. Factors determining the safe

and effective use of Re-RT include the type of initial treatment used, residual radiation tolerance of the normal tissues, and the duration of the relapse free interval (8). The presence of distant metastasis determines the likelihood of achieving a cure. The clinical indications for Re-RT including the optimal doses, fractionation schemes, and treatment techniques are not formalized.

The objective of this study was to determine the patterns of practice regarding reirradiation for in-field recurrence after previous radical radiation treatment among Canadian radiation oncologists (ROs).

METHODS AND MATERIALS

An electronic survey questionnaire (survey questionnaire can be accessed by connecting to: <http://www.ualberta.ca/~kjoseph/>)

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Re-irradiation.pdf), developed through consultation among investigators and with radiation oncologists experienced in Re-RT, was e-mailed to all 271 ROs registered in the Canadian Association of Radiation Oncology directory. The survey was performed online using the software from Survey Monkey (<http://www.surveymonkey.com>). All of the respondents were ROs in active practice in Canada at the time of mailing. The survey format consisted of questions on (1) the demographics of respondents, (2) the referral patterns and indications for Re-RT, (3) the treatment planning for Re-RT, and (4) case scenarios selected from the seven most common tumor sites where in-field recurrence occurred (brain, breast, colorectal, genitourinary, gynecologic, gastrointestinal, and head and neck). Case scenarios were constructed to represent typical presentations of locally recurrent tumors after curative treatment. Physicians were asked to complete questions specific to their respective sites of practice. The completed surveys were received electronically via e-mail. Descriptive summaries of variables and data analyses were performed using SAS 9.1.3 software (Statistical Analysis Systems, Cary, NC).

RESULTS

Demographics of the respondents

Characteristics of the respondents are given in Table 1. A total of 183 ROs (67.5%) completed and returned the survey. Among the respondents, 20% had been in practice for more than 20 years and 19% were less than 5 years in practice. Most of the respondents were involved in the practice of either breast (48%) or genitourinary (43%) tumor sites. Forty-nine percent of the ROs indicated an interest in the management of in-field recurrences; 59% of the respondents reported that there was no departmental initiative (no guideline nor enthusiasm) in the management of this group of patients. The respondents estimated that on average of 10 (0–15) patients with in-field recurrences would be seen per RO per year. More than 90% of these patients were willing to undergo retreatment and majority of them (88%) were retreated.

Referral patterns for Re-RT

Patients with in-field failures most commonly presented to the RO clinic for symptom control (50%), particularly when they were unfit for other treatment options such as surgery or chemotherapy. Less common indications were incomplete resection of in-field recurrences, second malignancies, disease progression on chemotherapy, intolerance of chemotherapy, and refractory seizures in brain tumor patients. The survey showed 32% of ROs would offer Re-RT with curative intent, 80% would use it for locoregional control and 99% for improvement of quality of life.

Eligibility and exclusion criteria for Re-RT

Respondents were asked to comment on the patient factors which would influence their decision-making for retreatment with curative intent. A total of 73% stated that age was not a significant deciding factor, whereas important considerations were performance status (68.5%), life expectancy (60%), absence of distant metastases (54%), and interval since previous treatment (79%). Most of the ROs believed

Table 1. Characteristics of respondents

Characteristic	Responses	Number (%)
1. Years in RO practice	<5 y	35/183 (19)
	5–10 y	42/183 (23)
	11–20 y	69/183 (38)
	>20 y	38/183 (20)
2. Anatomic sites of practice	Central nervous system	39 (21.7)
	Head and neck	45 (25.0)
	Lung	62 (34.0)
	Breast	87 (48.3)
	Gastrointestinal	51 (28.3)
	Gynecologic	41 (22.8)
	Genitourinary	77 (42.8)
3. Physicians with particular interest in Re-RT	Palliative	72 (40.0)
	Yes	87 (48.9)
	No	83 (46.6)
4. Estimated number of patients with in-field cancer recurrences per RO per year	Don't know	8 (4.5)
	Average: 10 (range, 0–15)	

Abbreviations: RO = radiation oncologist; Re-RT = reirradiation.

that patients should have a minimum Karnofsky performance scale of 50 or Eastern Cooperative Oncology Group performance status of 3, a minimum life expectancy of 3 months and an interval of 3 months or more from initial treatment to be considered for Re-RT (Table 2).

Other prerequisite conditions were (1) biopsy confirmation of the in-field recurrence, (2) informed consent ensuring the patient's full understanding of the risks of retreatment, (3) absence of significant late toxicity from previous RT, and (4) radiosensitive tumor. The recommended treatment planning considerations included (1) avoiding critical organs in the Re-RT volume, (2) keeping the retreatment volume as small as possible, and (3) keeping doses to the critical structures as low as is reasonably possible. It was generally accepted that Re-RT for salvage should be attempted as a last resort, especially in young patients and posttreatment toxicity/quality of life assessment should be documented.

Factors affecting Re-RT treatment planning

A total of 72% of respondents agreed that a metastatic workup was necessary before considering Re-RT. Most of the ROs indicated that factors such as previous total radiation dose (90%), volume of tissue irradiated (90%), and the biologically equivalent dose (BED) (68.5%) were significant considerations in deciding on the amount of residual normal tissue tolerance, the Re-RT dose and the feasibility of Re-RT. Other factors suggested by the ROs that could influence retreatment dose and normal tissue tolerance were (1) previous radiation technique, (2) dose per fraction, (3) response to

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