ORIGINAL ARTICLE

Clinical Profile of Cancer Patients of North East India Receiving Single Fraction Palliative Radiotherapy: A Study from Regional Cancer Centre

Navin Nayan[1], Apurba Kumar Kalita[2], Mouchumee Bhattacharyya[3], Ghritashee Bora[4], Shashank Bansal[4], Partha Pratim Medhi[5]

Authors' affiliation: [1]Asst. Prof., Dept. of Radiation Oncology, State Cancer Institute, Gauhati Medical College, Guwahati, Assam, [2]Prof. & HOD; [3]Professor; [4]M.D. Trainee; [5]Asst. Prof., Dept. of Radiation Oncology, Dr. B. Borooah Cancer Institute, Guwahati, Assam
Correspondence: Dr Apurba Kumar Kalita, Email: akkalita@yahoo.com, Mobile No.: 9864035015

ABSTRACT

Objectives: The objective is to study the patient-, disease-, and treatment-related characteristics of cancer patients receiving single fraction palliative radiotherapy, and to assess the efficacy of SFRT in the palliation of symptoms.

Methods: This is an observational study conducted in a regional cancer centre of North East India. The medical documents, and radiotherapy (RT) treatment charts were studied and subjective response assessment was done on first and subsequent follow up.

Results: A total of 3964 cases were allotted for radiotherapy for various indications during one year period (July 2017 – June 2018). Out of which 348 cases (8.8%) were allotted for single fraction palliative radiotherapy but only 164 cases (47%) received the treatment (SFRT). Among the patients treated with SFRT, 98 cases (59.8%) showed good response and 66 cases (40.2%) showed poor response to therapy. The most common indication for SFRT was palliation of pain from painful bony metastasis as seen in 81 cases (49.4%).

Conclusions: Palliative radiotherapy forms an integral part of palliative care of patients with advanced or metastatic cancer. Single fraction palliative radiotherapy is an effective, well-tolerated mode of treatment in an outdoor setting to improve the quality of life of these distressed patients.

Advances in knowledge: This study will benefit in the establishment of Institutional guidelines on the use of single fraction palliative radiotherapy.

Key words: Clinical profile, Cancer, Single fraction palliative radiotherapy, Palliative care, Bone metastasis

INTRODUCTION

Palliative care is an essential part of cancer control, both for adults and children. Palliative care, as defined by the World Health Organization, is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.

Thus, palliative care represents not only the care of the dying, but also involves the extended care of patients with advanced cancer and metastatic disease.[1,2] Radiotherapy (RT) is a successful, time-efficient, well-tolerated, and cost-effective intervention that is crucial for the appropriate delivery of palliative oncology care.[3] Palliative radiotherapy (PRT) is required in 30% – 50% of all cancer patients, and the primary aim of PRT is to provide adequate pain and symptom relief.[1,4,5] The main indications of PRT are pain relief, control of hemorrhage, fungation and ulceration, dyspnea, blockage of hollow viscera, and relief of pressure symptoms.

Radiotherapy can provide safe, cost-effective, efficient palliation of various symptoms of advanced cancer with minimal side effects.[6,7] The common palliative radiotherapy schedules are 30 Gy in 10 fractions, 24 Gy in 6 fractions, 25 Gy in 5 fractions, 20 Gy in 5 fractions, and a single 8 Gy fraction. Multiple prospective randomized trials have evaluated different fractionation schemes for bone metastases, with pain relief equivalency for schedules including 30 Gy in 10 fractions, 24 Gy in 6 fractions, 20 Gy in 5 fractions, and a single 8 Gy fraction. A single 8 Gy fraction has not shown any obvious deleterious effects, even when assessing late spinal cord tolerance in those who received treatment to

bones of the spine.[2] Data suggest that an 8 Gy treatment in a single fraction for re-RT is non-inferior and less toxic than 20 Gy in multiple fractions.[8]

Single fraction palliative radiotherapy (SFRT) is the common palliative radiotherapy schedule practiced at our Institute. We routinely practice single fraction palliative radiotherapy on every Saturday as an outdoor setting. In this study, we are studying the patient-, disease-, and treatment-related characteristics of cancer patients receiving single fraction palliative radiotherapy at our Institute.

METHODOLOGY

This is an observational study conducted in a regional cancer centre of North East India. Patients treated during the period of July 2017 to June 2018 were included in this study. The medical documents, and radiotherapy (RT) treatment charts were studied and subjective response assessment was done on first and subsequent follow up. The study population included all patients with histopathological confirmed malignancies, who were harboring either metastatic disease or loco-regionally advanced disease, who were unfit for curative management, and allotted for single fraction palliative radiotherapy in the multi-disciplinary tumor board of our Institute. Written informed consent was taken from the patient and the incurable nature of disease, likely outcome and need of palliative care were explained to the patient and the family members.

A record was made of the patient-, disease-, and treatment-related characteristics. The patient related characteristics included age, sex, religion, locality, and socio-economic status. The disease related characteristics included the site of primary disease, histopathological findings, loco-regionally advanced versus metastatic status, number and sites of metastatic lesions, and the final stage. The treatment related characteristics noted were indication of SFRT, anatomic site irradiated, dose of SFRT, machine on which treated (telecobalt/linear accelerator), and response to therapy.

Data were analyzed and inferences were drawn from these attributes. Data from previously published similar studies were also analyzed for comparison and discussion.

OBSERVATIONS AND RESULTS

A total of 3964 cases were allotted for radiotherapy for various indications during one year period (July 2017 – June 2018). Out of which 348 cases (8.8%) were allotted for single fraction palliative radiotherapy but only 164 cases (47%) received the treatment (SFRT).

Among the patients treated with SFRT, majority of the patients were older in age, male, Hindu by religion and belong to low socio-economic status **Table 1**.

Table 1: Patient characteristics

Characteristics	Patients treated with SFRT (N=64) (%)
Age	
≤50	72 (44)
>50	92 (56)
Sex	
Male	105 (64)
Female	59 (36)
Religion	
Hindu	116 (71)
Muslim	43 (26)
Christian	5 (3)
Socio-economic status	
High	10 (6)
Middle	70 (43)
Low	84 (51)

SFRT = Single fraction palliative radiotherapy

Table 2: Site of primary cancer

Primary site	Patients treated with SFRT (N=164) (%)
Head and Neck	47 (28.7)
Breast	26 (15.9)
Lung	25 (15.2)
MUO	9 (5.5)
Stomach	8 (5)
Multiple myeloma	7 (4.3)
Prostate	7 (4.3)
Rectum	7 (4.3)
Cervix	5 (3)
Oesophagus	5 (3)
Genitourinary	3 (1.8)
GE Junction	3 (1.8)
Thyroid	3 (1.8)
Ewing sarcoma	3 (1.8)
Anal canal	2 (1.2)
Gall bladder	2 (1.2)
STT	2 (1.2)

MUO = Malignancy of unknown origin, STT = Soft tissue tumor

Table 3: Indication of SFRT

Indications	Patients treated with SFRT (N=164) (%)
Bone pain	81 (49.4)
Bleeding	22 (13.4)
Extensive disease	18 (11)
Fungation/ulcerated mass	17 (10.4)
Large neck node	15 (9.1)
Brain metastasis	7 (4.3)
Poor general condition	4 (2.4)

Among the patients treated with SFRT, 98 cases (59.8%) showed good response and 66 cases (40.2%) showed poor response to therapy. Among the good responder, majority were with bone metastasis (63 cases, 64.3%). The most common indication for SFRT was palliation of pain from painful bony metastasis as seen in 81 cases (49.4%).

The most common primary site for single fraction palliative radiotherapy was head and neck region followed by breast and lung. Other common primary sites were stomach, multiple myeloma, prostate, rectum, cervix and esophagus **Table 2**.

The indications of single fraction palliative radiotherapy are summarized in **Table 3**. The most common indication for SFRT was bone pain followed by bleeding. Other indications were extensive disease not suitable for radical treatment, fungation/ulcerated mass, large neck node (N3b node), brain metastases and poor general condition not fit for radical treatment.

DISCUSSION

Radiotherapy can provide safe, cost-effective, efficient palliation of various symptoms of advanced cancer with minimal side effects.[6,7] Forty seven patients (28.7% of the total) in this study had their primaries in the head and neck region, which was the most common primary site of origin. In another similar study by Sharma et al. most of the primaries were of head and neck region (60%) only followed by gastrointestinal malignancies in 14% and lung cancer in 11% cases.[9] In another study by Singhal et al., 44% of patients had primary malignancy of head and neck region, 17% of lung cancer, 14% of cervical, 6% of breast, and 5% of colon.[10] In the present study, most common site of primary was head and neck region (28.7%), followed by breast (15.9%) and lung (15.2%), this can be explained by the fact that head and neck cancer is the most common cancer in this region and most of the patients presented with very large neck node, often ulcerated, which are not suitable for either radical or hypofractionated palliative radiotherapy. And, bone metastasis is common in breast and lung cancer where single fraction palliative radiotherapy is cost-effective and efficient mode of treatment.

In the present study, total 348 cases were offered single fraction palliative radiotherapy due to various reasons, however only 164 cases (47%) received the treatment (SFRT). Palliative radiotherapy (PRT) is indicated in 30% - 50% of all cancer patients, and patients receiving PRT should be adequately attended for pain and symptom relief.[9, 11] In this study, a total of 98 cases (59.8%) showed good symptomatic relief when first reviewed after one month of treatment. Among the good responder, majority were with bone metastasis (63 cases, 64.3%). This can be explained by the fact that the most common indication for SFRT was palliation of pain from painful bony metastasis as seen in 81 cases (49.4%). All patients received multimodal palliative care along with SFRT, such as oral metronomic chemotherapy, bisphosphonate, steroids, opioids, and assisted feeding. In a similar multicentric study by van Oorschot et al. PRT led to a significant improvement of well-being (35% of patients) and reduction of symptoms, especially with regard to pain (66%), dyspnea (61%), and neurological deficits (60%).[12] However, shortly after treatment, in approximately 40% of patients, a temporary pain flare occurs, which is thought to be caused by periosteal edema after radiotherapy. Dexamethasone reduces the incidence of a pain flare by 50%.[13]

In this study a single 8 Gy fraction was prescribed (in 164 patients). Multiple prospective randomized trials have evaluated fractionation schemes for bone metastases, with pain relief equivalency for schedules including 30 Gy in 10 fractions, 24 Gy in 6 fractions, 20 Gy in 5 fractions, and a single 8 Gy fraction. A single 8 Gy fraction has not shown any obvious deleterious effects, even when assessing late spinal cord tolerance in those who received treatment to bones of the spine.[2] Even in palliative care, different therapeutic goals (pain relief, local tumor control, prevention or improvement of motor deficits, stabilization of the spine or other bones) require integrated approaches considering individual factors i.e. life expectancy, tumor progression at other sites. However, best results are achieved by close interdisciplinary cooperation and minimizing the interval between diagnosis and onset of treatment.[14]

In our study, a single 8 Gy fraction was offered to many patients as re-irradiation after initial PRT or radical RT. Data suggest that an 8 Gy treatment in a single fraction for re-RT is non-inferior and less toxic than 20 Gy in multiple fractions.[15] However, in a systemic review and meta-analysis by Huisman et al. to quantify the effectiveness of re-irradiation for achieving pain control in patients with painful bone metastases, it was observed that re-irradiation was effective for a small majority of patients. Approximately, 40% of patients did not benefit from re-irradiation.[16]

Radiation therapy is effective and regarded as the treatment of choice for metastatic spinal cord compression with or without motor deficits and/or bone metastases, which do not need immediate surgical intervention. It may be used either postoperatively or as primary treatment in case of inoperability.[17] Patients treated with primary RT generally respond to multi-treatment regimens such as 30 Gy in 10 fractions, although patients with short life expectancy might fare well with a single 8 Gy dose.

With the majority of patients presenting at very advanced stage disease, some form of cost-effective, resource-sparing radiation treatment schedules are necessary to provide the maximum relief. In our Institute, we routinely treat patients with single fraction RT, but there is no local data available regarding its efficacy. Many Institutional and multicentric data support the use of single 8 Gy fraction RT in painful bone metastases with comparable efficacy. This study will benefit in the establishment of Institutional guidelines on the use of single fraction palliative radiotherapy.

CONCLUSION

Palliative radiotherapy is commonly employed to address symptoms in patients with cancer. With regard to different therapeutic goals, different dose and fractionation schedules, single versus multi-fraction PRT should be used individually. Evidence suggests that the reluctance of radiation oncologists to provide single fraction treatment acts as a barrier to referrals from palliative care professionals. Single fraction palliative radiotherapy is an effective, well-tolerated mode of treatment in an outdoor setting to improve the quality of life of these distressed patients. However, in the absence of well-defined national guidelines for use of PRT, every Institute should formulate its own protocol best suited for the patient's requirement.

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