



## PATTERN OF PALLIATIVE RADIOTHERAPY DELIVERED USING TELECOBALT MACHINE FOR DIFFERENT MALIGNANT SITES.

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### ABSTRACT

**Background :** Majority of patients with advanced or metastatic cancer need palliative radiotherapy (PRT) for symptoms palliation. The purpose of this study was to assess pattern of PRT delivered using Telecobalt machine.

**Material and method:** This was a retrospective analytical study of patients receiving PRT on Telecobalt machine from 1<sup>st</sup> July 2015 to 31<sup>st</sup> July 2016. All patient and treatment related details were filled in a preformed patient record form and analyzed.

**Result:** The study cohort was comprised of 61 patients. The median age was 56.11 years and male to female sex ratio was 1:1.4. Head and neck cancer was the most common primary site receiving locoregional PRT. Among the metastatic sites; bone metastasis was most commonly treated (72.72%). All patients tolerated treatment well.

**Conclusion :** RT is time efficient, well tolerated and can be widely used treatment modality for palliation of both the primary and metastatic malignant lesion.

**KEYWORDS :** radiotherapy, palliative, cancer

### Introduction:

Radiotherapy (RT) is an integral part in the management of most of the solid malignancies. Majority of patients with malignant disease present in advance stage of disease. These patients with advanced or metastatic cancer will need palliative radiotherapy (PRT) for palliation of their symptoms at some point of time during their oncology treatment.

Locoregionally advanced disease will cause pain, pressure symptoms or bleeding. This can be effectively managed with RT<sup>1,2</sup>. The common metastatic sites treated with RT are brain and bone. Whole brain RT is the mainstay of treatment for most patients with brain metastasis. This produces the symptomatic relief of 75-80% and survival as well as radiological response in 60% cases<sup>3</sup>. The Cochrane review on RT for bone metastasis had reported 60% pain alleviation<sup>4</sup>.

Sparse studies have reported pattern of PRT for different malignancies in a single study. This is a retrospective study analyzing pattern of PRT used for different malignant sites; both for primary and metastatic disease along with different disease and treatment related factors.

### Material and method:

The hospital case record of all patients treated consecutively with RT using Telecobalt machine from 1<sup>st</sup> July 2015 to 31<sup>st</sup> July 2016 were evaluated retrospectively after prior permission from the Hospital Ethics Committee. The patients receiving radical RT were excluded. Patients receiving RT with palliative intent; for locoregional or metastatic disease were studied further. Cases were further subdivided depending on site of PRT, primary and loco-regional or metastatic site. Patients receiving fractionated RT course were subdivided into short fractionation (less than one week) versus long fractionation schedules (more than one week) depending on treatment time. The patient record form including patient, disease and treatment related parameters which have to be evaluated was formed. Data entry was done in the format accordingly. Statistical analysis was done using Excel sheet and results were tabulated.

### Results:

The case records of patients receiving RT on Telecobalt machine were screened. The patients who received radical RT were excluded from the study. Sixty-one consecutive cases treated with palliative intent formed a study cohort. The median age was 56.11 years. Male

to female sex ratio was 1:1.4. Squamous cell carcinoma (39.34%) was most common histopathology type followed by adenocarcinoma (34.42%). The disease was non-metastatic in 22 cases (36.06%) and metastatic in 39 cases (63.93%). Majority (92.30%) of patients had multiple metastasis and only 3 patients (7.6%) were diagnosed to have oligometastasis (single metastatic lesion) (Table 1).

Most common primary malignancy treated with PRT was head and neck cancer (24.59%), followed by genitourinary (GU)-gynecological (GY) (21.31%) and breast (16.39%) (Table 2). Twenty eight patients (45.90%) received PRT at primary and/or local lymph node site while 33 patients (54.09%) received PRT at metastatic site. Head and neck cancer was the most common primary site receiving local RT for palliation followed by oesophagus and cervix. Among the 33 cases treated for PRT at metastatic site, 24 (72.72%) were bone metastasis, 10 (30.30%) were brain metastasis. Two patients received RT for both brain and bones metastasis. Bone metastasis (n=24) were most common in cancer breast (6 patients) while brain metastasis (n=10) were common in cancer lung (5 patients) (Table 3). Re-irradiation for painful bone metastasis was done in four patients around 9 months to one year after first course of PRT. Two patients were treated for symptomatic superior vena cava obstruction.

All patients received RT on daily basis. Two patients (3.27%) were treated with single fraction RT while 59 (96.72%) patients received fractionated RT. Commonly used dose fractionation schedule was 20 Gy in five fractions over a week (57.37%) followed by 30Gy in 10 fraction over two weeks (34.42%). Fifty-five patients (90.16%) completed the planned treatment and six patients (9.83%) did not complete the prescribed RT treatment. Response to RT was not mentioned in the records of 27 patients (44.26%). Less than 50% relief in symptoms after PRT was noted in 13 (21.31%) patients while symptom relief was more than 50% in 21 patients (34%) (Table 4). None of the patients reported grade III or grade IV skin or mucosal toxicities according to CTCAE v 4.03.

### Discussion:

Aim of palliative therapy is to decrease the symptoms with relatively good quality of life. RT plays an important role in palliation of symptoms either locoregional or metastatic. Locoregionally advanced disease may cause tumor bleeding, pressure symptoms and secondary infection. RT as palliative treatment modality is commonly used for symptom palliation in Head Neck cancer. Agarwal et al, had studied role of hypofractionated RT in locally

advanced Head and neck cancer. The fractionation schedule used was 40Gy in 16 fractions over three weeks. The study concluded that hypofractionated RT was effective in symptom control<sup>5</sup>. The effectiveness of twice weekly PRT to dose of 32 Gy in eight fraction was evaluated by Murthy et al. They found it as effective fractionation schedule with less acute toxicities<sup>6</sup>. Very short PRT schedule i.e. quad shot RT with 14 Gy delivered in only two days was well tolerated with very good symptom relief<sup>7</sup>. In our study, 12 patients of locally advanced head and neck cancer received PRT. Eight patients were treated with RT dose of 30 Gy or more and four patients received 20Gy in five fractions. Response was documented in seven patients who reported more than 50% symptom relief.

The other malignant sites receiving PRT at primary site in our study were cervix and oesophagus. All patients received 30 Gy in 10 fractions except the one who received 20 Gy in five fractions. Mishra et al used monthly PRT of cancer cervix with good symptom relief<sup>8</sup>. Louise et al concluded that 20 Gy in five fraction is effective in palliation of dysphagia in cancer oesophagus<sup>9</sup>.

Prevention of skeletal events is one of the goal of PRT in bone metastasis. The common distant metastatic site for breast cancer is bone. In our study, bone metastases were most common in cancer breast. All patients except three were treated to a dose of 20Gy in five fractions and rest three received dose of 30 Gy or more. Three patients were re-irradiated after around duration of nine to 12 month after primary PRT. Re-irradiation was done using eight Gy in single fraction. Chaow et al had concluded that re-irradiation rates were high after single fraction RT<sup>10</sup>. But; the three patients who needed re-irradiation for bone metastasis in our study were previously treated with fractionated RT. Though Cochrane database review mentioned there is no difference in single fraction RT over fractionated RT in terms of pain control, the rate of pathological fracture and re-irradiation is more with single fraction RT<sup>4</sup>.

The role of highly conformal and focal RT for brain metastasis is documented in the literature<sup>11</sup>. In our study, all the metastatic brain lesions were treated with whole brain RT. Four patients were treated with 20 Gy in five fractions while six patients received 30 Gy in 10 fractions. RTOG randomized control trials failed to show improvement in median survival time when comparing different fractionation schedules<sup>12</sup>. We found lung as the commonest primary site associated with brain metastasis.

The commonly used fractionation schedule in our study was 20 Gy in five fractions. This was suitable for the patient and relatives considering the transport of patient and short treatment time. Majority of the patients (90.16%) completed the planned treatment. Though the treatment response was not documented in 77.04% cases, might be because of very advanced nature of disease patients did not reported back for response evaluation, 14.75% patients reported more than 50% symptom relief. All patients tolerated treatment well without significant radiation side effects.

### Conclusion:

Radiotherapy is well tolerated and can be widely used treatment modality for palliation of both the primary and metastatic lesion. Short fractionation schedule is preferred. Though large number of patients needs to be studied further for documentation of different parameters of palliative radiotherapy and comparison of different fractionation schedules.

**Table 1: Niceties of study cohort (n = 61)**

<b>Age (years)</b>	
<b>Median</b>	56.11
<b>Minimum</b>	18
<b>Maximum</b>	93
<b>Sex</b>	
<b>Male</b>	25 (40.98%)
<b>Female</b>	36 (59.01%)

<b>Histopathology type</b>	
<b>Not known/ not done</b>	03 (4.91%)
<b>Squamous cell carcinoma</b>	24(39.34%)
<b>Adenocarcinoma</b>	21(34.42%)
<b>Other</b>	13(21.31%)
<b>Distant Metastasis</b>	
<b>Not known</b>	00 (0%)
<b>Present</b>	39(63.93%)
<b>Absent</b>	22(36.06%)
<b>No. of metastasis</b>	
<b>Not known / not related</b>	22(36.06%)
<b>Single / oligometastasis</b>	03(4.91%)
<b>Multiple</b>	36(59.01%)

**Table 2: Site of primary malignancy**

Primary site	Number	Percentage
<b>Unknown primary</b>	03	4.91%
<b>Breast</b>	10	16.39%
<b>Lung</b>	05	8.19%
<b>Head and Neck</b>	15	24.59%
<b>Gastro Intestinal Tract</b>	09	14.75%
<b>Oesophagus</b>	06	9.83%
<b>Non-oesophagus GIT</b>	03	4.97%
<b>GU/GY</b>	13	21.31%
<b>GU</b>		
<b>Prostate</b>	04	6.55%
<b>Other</b>	01	1.63%
<b>GY</b>		
<b>Cervix</b>	06	9.83%
<b>Other</b>	02	3.27%
<b>Other</b>	06	9.83%

**Table 3: Palliative RT sites**

Site	Frequency
<b>Local</b>	24(39.34%)
<b>Head and neck</b>	12
<b>Cervix</b>	04
<b>Oesophagus</b>	05
<b>Other</b>	03
<b>Regional</b>	04 (6.55%)
<b>Metastatic</b>	27 (44.26%)
<b>Bone</b>	20
<b>Brain</b>	06
<b>Soft tissue</b>	01
<b>Loco-regional +metastatic</b>	04(6.55%)
<b>Bone</b>	02
<b>Brain</b>	02
<b>Other</b>	00
<b>Both bone and brain</b>	02(3.27%)

**Table 4: Palliative RT details**

Treatment and response parameters	Frequency	Percentage
<b>Schedule</b>		
<b>Daily</b>	61	100%
<b>Other</b>	00	00%
<b>Fractionation</b>		
<b>1. Single</b>	02	3.27%
<b>2. Multiple</b>	59	96.72%
<b>2.1 Short fractionation</b>	34	55.73%
<b>2.2 Long fractionation</b>	25	40.98%
<b>RT dose (Gy)</b>		
<b>&lt;/= 8</b>	02	3.27%
<b>20</b>	35	57.37%
<b>30</b>	21	34.42%
<b>&gt;30</b>	03	04.91%
<b>Treatment completion</b>		
<b>Yes</b>	55	90.16%
<b>No</b>	06	09.83%

<b>Treatment response</b>		
<b>Not known/not done</b>	27	44.26%
<b>Less than or equal to 50% relief</b>	13	21.31%
<b>More than 50% relief</b>	21	34%

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