



RADIATION IN A PALLIATIVE SETTING DURING COVID-19 ERA. AN INDIAN TERTIARY CANCER CARE PROSPECTIVE – RISKS, BENEFITS .

Oncology

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ABSTRACT

India and the rest of the world are experiencing an outbreak of the COVID- 19 virus. WHO has declared 2019 novel coronavirus disease (COVID-19), a public health emergency of international concern. (1)

Palliative treatment compromises a major portion of radiation treatments in cancer. (2) Metastatic or palliation treatment presents a unique challenge in resource-limited settings as ours and early treatment to alleviate their symptoms and disease is the need of the hour to prevent further morbidity and mortality.

These patients are usually more cachexic with low immunity and more prone to infection of COVID-19 than the normal population, here their treatment has to be expedited and their visits to the hospital to be minimized to prevent infection with COVID. (3) We reviewed the best evidence and recommended best practices for the treatment of common oncologic emergencies with more emphasis on balancing the risk of infection with the COVID-19 virus and the potential morbidity of delaying treatment.

In COVID -19 Era pandemic, the use of hypofractionated radiation therapy for palliative patients for oncologic emergencies achieves intended functional outcomes without compromising care.

KEYWORDS

INTRODUCTION:

The Covid-19 pandemic has shifted the focus on prioritizing treatments in cancer patients to achieve an optimum balance between the risk of contracting covid 19 and achieving the desired oncological outcome. (4) This prioritization becomes even more significant for locally advanced and metastatic cancer patients requiring palliative radiotherapy. These patients need immediate or early RT to alleviate symptoms. But at the same time immunosuppression due to high disease burden and additional chemotherapy predispose them to a higher risk of infection.

A large proportion of patients with advanced cancer is subjected to palliative therapy including chemotherapy and palliative radiotherapy (RT) during their course of treatment. (5) Treatment with RT is critical for the treatment of oncologic emergencies, mainly neurologic injury from cord compression or brain metastases, airway compromise, and bleeding.

It is imperative to note that the preliminary data from China and Italy have demonstrated that cancer patients have a higher risk of contracting the virus and a higher case-fatality rate. (6) Further, chemotherapy and RT induced immunosuppression coupled with tumor related cachexia and poor nutrition status make these patient the most vulnerable group for covid infection. It is, of utmost importance to be sensible in the use of RT and to consider shorter courses of palliative RT for oncologic emergencies where ever necessary.

Here in our institute being a tertiary cancer care institute we have come up with some guidelines for judicious use of radiation in a palliative setting in the COVID-19 era.

METHODS AND MATERIALS:-

We reviewed high-impact evidence, prior systematic reviews, and national guidelines to compile recommended practices for the treatment of common oncologic emergencies were reviewed to reach at a consensus at our institutional joint clinic involving radiation oncologists from different disease management groups.

Here we would discuss our individual institutional experiences and best practices in the unique circumstances of this global pandemic. Specific attention was given to balancing the risk of infection with the COVID-19 Virus and the potential morbidity of delaying treatment.

Suggested considerations:-

Clinical Evaluation:-

Prior to triage as agreed by the hospital COVID -19 Response team, staff were given treatment station appropriate PPE's to evaluate the patients where in history of present illness, performance status, current symptoms, and imaging of each patient taken with all required precaution and thereby limiting the spread of the COVID-19 virus. Usually, physical examination is essential for decision-making, including pain assessments and neurologic evaluation whenever necessary, patient encounters are limited to a single radiation oncologist.

When the personal evaluation is clinically indicated, all patients and their attendants would required to adhere to institutional policies as mandated by ICMR (Indian Council of Medical Research), and GOVT policies on social distancing, handhygiene. For the purpose of effective triage based on extent of oncological emergency and seriousness of symptoms the patients were divided into 3 groups , the details of which have been innumarated in table 1.

Group -1 Patients were given utmost importance

Hypo fractioned palliative regimen

Sl No	INDICATION	TREATMENT	REFERENCE
1.	a. Brain metastases requiring whole-brain RT	12Gy X 2# steroids alone	QUARTZ: Steroids alone for patients with poor performance status(7,8)
2.	Cord compression	8Gy X 1daily fraction	Maranzano et al, SCORAD III, ICORG 05-03(9)

3.	Tumor bleeding	4 Gy X 5 daily fractions OR 8Gy X 1 Fraction	RTOG 7905: "Quad Shot" is safe and effective. (10,11)
4.	SVC syndrome airway obstruction	8 Gy X 2 daily fractions	Sundstrom et al(12)
5.	Bone metastases	8Gy X 1 daily fraction	RTOG 9714(13)

Patient triage:-

In the setting of the COVID-19 pandemic, our department developed and implemented a 3-Pong strategy to identify clinically urgent cases in which delaying treatment would result in compromised outcomes or serious morbidity. For patients warranting palliative RT, patients with oncologic emergencies are assigned with the group 1 designation (Table 1). This includes patients with cord compression, spinal compression. Group 2 includes patients with symptomatic disease, which is the barring of oncologic emergencies for which RT is the standard of care, and patients with the asymptomatic disease for which RT is advocated to prevent imminent functional deficits. Group 3 includes patients with symptomatic or asymptomatic disease for which RT is one of the effective treatment options.

Table-1

	Radiation groups based on treatment indication
Group -1 (Most important)	Patients with oncologic emergencies (neurologic compromise, airway compromise like superior venacava syndrome, etc) requiring urgent palliative RT
Group -2	Patients with symptomatic disease exclusionary of oncologic emergencies for which RT is the standard of care Patients with the asymptomatic disease for which RT is recommended to prevent impending functional deficit [ex tumor bleed]
Group-3	Patients with the symptomatic or asymptomatic disease for which RT is one of the effective treatment options [Brain Mets]

The requirement of RT is a need-based approach for Group -1 patients to alleviate their symptoms.

Management of oncologic emergencies

Brain metastases:-

Brain metastases are very frequent, affecting up to 25% of all cancer patients. (14) For decades, the standard treatment for most patients with brain metastases has been whole-brain radiotherapy (WBRT), resulting in symptomatic improvement in a majority of patients. (15) There is an evolving consensus on management of brain met using several prognostic scores mainly RPA risk stratification with patient prognosis, histology, competing risks, and neurologic symptoms. (16) For the patient with a favorable prognosis (RPA-1 and 2), we deliver SRT to all the symptomatic lesions that would result in morbidity and potentially avoid whole brain radiation. But where inpatient presents with progressive neurologic symptoms from multiple brain metastases or leptomeningeal disease WBRT indicated.

For these patients, we generally use 12Gy/2# (once weekly) instead of standard 30Gy/10# (daily) thereby reducing the visits to the hospital which results in decreasing infection chances. For patients with poor prognosis, the Quality of Life(QoL) after treatment for Brain Metastases study demonstrated that similar rates of overall survival and QoL with steroids and best supportive care alone is comparable with that of WBRT (17), hence which implies that observation can be preferred to limit exposure to COVID-19.

Spinal cord compression:-

It is a multidisciplinary approach in consultation with neurosurgery, and along with evaluation degree of spinal cord compression and presence or absence of spinal stability. We use neurologic, oncologic, mechanical approaches to facilitate the selection of optimal treatment of the patient. (18)

Many studies have shown that single fraction is as efficacious as multiple fraction radiation and meta-analysis of 3 randomized clinical trials shows that there was preserved motor response without any clinical difference between single-fraction radiation treatment (8 Gy x 1 fraction) and multifraction treatment at a 2-month.(19,20) We have noted that 8 Gy x 1 fraction provides good rates of palliation and allows for further safe retreatment with either conventionally fractionated or

stereotactic body radiation therapy approaches if warranted any time in the future. But in the case of significant soft tissue involvement, we give a 12Gy x 2 fraction which gives us an advantage radiobiologically.

With the emergence of the COVID-19 pandemic, the risk of nosocomial infection from a patient daily visit to the hospital and the potential exposure to staff and other patients must be thought of against the potential benefit of multi-fractionated treatment.

Tumor bleeding

Uncontrolled tumor bleeding is an oncologic emergency with a potentially life-threatening condition that can be effectively managed by palliative radiation.

The regimen used in our institution for hemostatic RT is 8Gy X 1 fraction(for the pelvic region) which is well tolerated and achieves good bleeding control. But in head and neck cases we use 4 Gy x 5 daily fractions so that it reduces the disease burden and along with further chances of tumor bleed.(10,11)

Owing to the increased risk of nosocomial and COVID-19 exposure, our institute has recommended limiting the treatment of patients with COVID-confirmed or suspicious cases to a single treatment machine at the end of the day to facilitate sterilization.

Superior vena cava(SVC) syndrome/airway obstruction

SVC syndrome can present with severe airway and neurologic or hemodynamic compromise. Radiation may be effective in relieving malignancy-associated hemoptysis but has limited utility for relieving dyspnoea and cough. Studies have reported better results with 8 Gy x 2 fractions (one weekly) for patients with central airway emergencies. (12,21)

We prefer 8Gy x 2 fractions over other regimens because of the logistic reasons and minimal hospital visits.

With the potential of acute respiratory distress syndrome(ARDS), the need for mechanical ventilation, and the probable need for structural and obstructive lung disease is usually explained and a multidisciplinary consultation is done always before recommending RT palliation for malignant airway obstruction.

Painful bone metastases:-

RT gives a good symptom control for patients who have severe painful bone metastases. NCCN gives a comprehensible list for the management of bone Mets. If there is an impending fracture, we suggest having a consultation with the orthopedic or interventional radiology dept and RT is delayed till the spine is stabilized and thereafter assessed for need of palliative RT.

Radiation should also be contemplated if any anticipation of localized pain from a metastasis would result in potential admission for a pain crisis. Radiation is indicated as per several studies and the Choosing Wisely campaign supports 8 Gy x 1 fraction treatment for uncomplicated bone metastases. (22–24)

RESULTS : Till today we have treated 208 patients during COVID - 19 era at our hospital.

CONCLUSION:-

Palliative RT plays a vital role in alleviating the patient symptoms and preventing potentially serious morbidity to the patient even more so than ever during the COVID-19 pandemic era. The nature and the intent of treatment should be informed to the patient and their relative. Chinese data advocates that 40% of patients with active cancer diagnoses required either intubation or died which is significantly more than a general population but here author himself acknowledges that it's a small sample to further comment on.

For patients who are suitable and requiring palliative RT, a hypofractionated RT regimen treatment is of immense value to diminish the risk of COVID-19 exposure to all patients and staff by not compromising on functional outcomes. Using hypofractionated RT allows for further patient compliance and allows for treatment completion. This strategy helps us without compromising patient safety and we can optimize staff allocation and resources.

Hence we can safely conclude that hypofractionated regimens for

palliative radiation is the way forward to reduce the risk and maximize the benefit for both individuals and the population at large during the COVID-19 pandemic.

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