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Research Article

# Brief palliative radiotherapy course for advanced and incurable head and neck cancer

## Abstract

**Purpose:** Palliative radiotherapy schedule for inoperable Squamous cell carcinoma of head and neck (SCCHN) will evaluated in terms of palliation of cancer-related symptoms and acute toxicities.

**Materials and Methods:** This study included fifty patients with inoperable SCCHN. All patients received 30 Gy / 10 fractions / 5 fractions per week. Treatment-related toxicity was assessed using Radiation Therapy Oncology Group criteria. Cancer-related symptoms were assessed before starting and at the completion of radiotherapy. Tumor response rate was evaluated by standard WHO criteria.

**Results:** Fifty patients with advanced and incurable HNSCC were enrolled in this study. The majority of patients were, male gender, karnofsky performance status and clinical stage IV. Approximately half of the patients had laryngeal cancer and the most common distressing symptom was pain. All patients had greater than 50% pain, dysphagia, hoarseness of voice and dyspnea relief and 22/25 patients had greater than 50% decrease in the size of neck masses. Overall response rate was 72%. No grade 3 or more acute toxicity was reported. The most common grade 2 acute toxicity was mucositis (n=28, 56%).

**Conclusion:** Short course of palliative radiotherapy may be offered for patients with inoperable locally advanced SCCHN, who are unsuitable for other anticancer measures as well as long course radiotherapy. Further large scale multicenter studies in this field are indicated.

## Introduction

Head and neck cancer is one of the highly prevalent cancers in developing countries [1,2]. SCCHN comprises over 25% of the overall cancer burden in some developing countries [3]. Unfortunately less than 10% of published literature on SCCHN comes from developing countries where it is largely prevalent [4].

SCCHN represents a treatment challenge because of their aggressive biological behavior. For patient with locally advanced disease at time of diagnosis, survival drops markedly, majority of them present in extensive locoregional involvement, poor general condition, or comorbid conditions, so the intent of treatment in such cases is to improve the quality of their life, to achieve durable distressing symptoms relief while keeping short overall treatment time , keeping their socioeconomic condition in mind and utilizing the precious resources for curable conditions [4-7].

Palliative , short duration, radiotherapy schedule for locally advanced inoperable head and neck cancer provides high chance of lessening symptoms with low treatment-related toxicities and brief treatment time.

The present study was carried out to evaluate the outcome of palliative radiotherapy schedule for locally advanced inoperable head and neck cancer for palliation of cancer-related distressing symptoms and to assess acute treatment-related toxicities and tumor response rate.

## Patients and methods

This single-arm, prospective study was conducted at clinical oncology and nuclear medicine department, faculty of medicine, Mansoura university.

### Inclusion criteria

- Patients aged older than 18 years.
- Surgical unresectable stage IVB head and neck cancer.
- Stage III and IVA disease-poor performance status, or significant comorbid illness.



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- Stage IVC disease-for palliation of local symptoms.
- Non-nasopharyngeal, non- PNS, or non salivary gland primary
- No previous history of cancer.

### Radiation planning and treatment

All patients received 30 Gy in 10 fractions with 5 fractions per week. Patients will be immobilized in supine position and head fixed with thermoplastic cast. Primary and nodal gross tumor volumes will be outlined based on clinical examination, radiological studies. Radiotherapy portal will include gross tumor volume with 2 cm margin. Radiotherapy was delivered by parallel opposed lateral technique in cobalt machine.

### Supportive care during radiation

Distressing presenting symptoms like pain, dysphagia, hoarseness of voice, dyspnea and neck swelling were recorded and graded on a pragmatic scale of mild, moderate, and severe as per the patient's reporting of the complaint. Nasogastric feeding or gastrostomy tube were offered if required.

### Assessment of toxicity

Patients were assessed weekly for treatment-related toxicity and tolerance. Treatment-related toxicity including radiation mucositis, dermatitis and xerostomia were assessed using RTOG criteria [8].

### Assessment of cancer-related distressing symptoms

Patients were specifically asked about symptom relief compared to baseline presentation. Symptoms will be scored on scale of 0-10 and graded as (1-3) mild, (4-6) moderate, and (7-10) severe.

### Assessment of tumor response rate

Tumor response rate was evaluated by standard WHO criteria [9].

### Posttreatment follow-up

Tumor response and symptoms relief were periodically monitored at 1 month and then 3 monthly or earlier if necessary.

### Statistical analysis

Patient characteristics were reported as frequencies and proportions. Symptoms relief (categorical variable) were compared by frequency distribution. Toxicities were graded (categorical variable) and were reported as frequencies and proportions. Tumor response rate was reported as frequencies and proportions.

## Results

Between July 2016 and June 2018 inclusive, 50 patients with HNSCC were enrolled in this study. The majority of patients were ≥ 50 year (n=44, 88%), male gender (n=38, 76%), karnofsky performance status 50-60 (n= 35, 70%) and clinical stage IV (n=35, 70%). Approximately half of the patients had laryngeal cancer and the most common distressing symptom was pain (Table 1).

Pain, mass, dysphagia, hoarseness of voice and dyspnea were graded to mild, moderate and severe (Table 2).

All patients had greater than 50% pain, dysphagia, hoarseness of voice and dyspnea relief and 22/25 patients had greater than 50% decrease in the size of neck masses (Table 3).

Four of fifty patients had complete response, 32 patients had partial response, 8 patients had Stable disease, 6 patients had Progressive disease (Table 4).

**Table 1:** Patient and tumor characteristics.

| Characteristics | Value |
|---|---|
| Age at the time of diagnosis<br>Median (range), year | 59 (44-69) |
| Gender<br>Male<br>Female | <br>38 (76%)<br>12 (24%) |
| Karnofsky performance status<br>>70<br>50-60<br><50 | <br>7 (14%)<br>35 (70%)<br>8 (16%) |
| Primary tumor site<br>Oral cavity<br>Oropharynx<br>Hypopharynx<br>Larynx | <br>10 (20%)<br>10 (20%)<br>6 (12%)<br>24 (48%) |
| TNM stage grouping<br>III<br>IV | <br>15 (30%)<br>35 (70%) |
| Presenting symptoms<br>Pain<br>Mass<br>Dysphagia<br>Hoarseness of voice<br>Dyspnea | <br>40 (80%)<br>25 (50%)<br>10 (20%)<br>10(20%)<br>9(18%) |

**Table 2:** Symptoms before radiotherapy.

| Symptoms | Mild | Moderate | Sever | Total |
|---|---|---|---|---|
| Pain | 8 | 26 | 6 | 40 |
| Mass | 4 | 15 | 6 | 25 |
| Dysphagia | 1 | 6 | 3 | 10 |
| Hoarseness of voice | 2 | 7 | 1 | 10 |
| Dyspnea | 1 | 5 | 3 | 9 |

**Table 3:** Relief of symptoms after radiotherapy.

| Symptoms | < 50 % relief | 50-75% relief | > 75% relief |
|---|---|---|---|
| Pain | - | 17 | 23 |
| Mass | 3 | 12 | 10 |
| Dysphagia | - | 5 | 5 |
| Hoarseness of voice | - | 4 | 6 |
| Dyspnea | - | 3 | 6 |



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No grade 3 or more acute toxicity was reported. The most common grade 2 acute toxicity was mucositis (n=28, 56%). Seventeen (34%) patients had grade 2 dermatitis, and 19 (38%) patients had grade 2 xerostomia (Table 5).

**Table 4:** Response after radiotherapy.

| Response | Number of patients | Percentage |
|---|---|---|
| Complete response | 4 | 8% |
| Partial response | 32 | 64% |
| Stable disease | 8 | 20% |
| Progressive disease | 6 | 12% |
| Total | 50 | 100% |

**Table 5:** Acute radiation toxicity in 50 patients.

| Worst toxicity | Number of patients (Percentage) |
|---|---|
| Skin (dermatitis) | |
| Grade 1 | 31 (62%) |
| Grade 2 | 17 (34%) |
| Mucous membrane (mucositis) | |
| Grade 1 | 20 (40%) |
| Grade 2 | 28 (56%) |
| Salivary gland (xerostomia) | |
| Grade 1 | 31 (62%) |
| Grade 2 | 19 (38%) |

## Discussion

In developing countries approximately 75% patients with HNSCC present with locally advanced stages and part of them in an inoperable disease [9].

Inoperable locally advanced head and neck cancer response to aggressive treatments including chemoradiotherapy is poor and is associated with significant treatment-related toxicities [10]. Most of these patients present with distressing symptoms like pain, neck masses, dysphagia , hoarseness of voice and dyspnea, poor general condition , or comorbid conditions . The main objectives of treatment in this setting are to palliate distressing presenting symptoms with minimal treatment-related toxicities, improvement of quality of life and cost benefit issues rather than cure and increasing the life expectancy [11].

Although, aggressive multimodality treatment coupled with poor compliance results in suboptimal outcome, there has been little interest in the palliative treatment of incurable head and neck cancer [12].

There were sparse literatures on palliative regimens for symptom control in inoperable locally advanced head and neck cancer that indicate evaluation the role of palliative radiotherapy for durable relief of distressing symptoms with minimal treatment-related toxicities [13].

The present study tried to evaluate the benefit of short course of radiotherapy for inoperable locally advanced head and neck cancer, delivering high biological dose to achieve durable distressing symptoms relief while keeping short overall treatment time. Brief course of radiotherapy regimen of 30 gray in 10 fractions was chosen that is commonly used and well tolerated regimen in palliative radiotherapy of other malignancies.

An optimal dose fractionation schedule for palliative radiotherapy in head and neck cancer did not set yet even though there are some guidelines for curative settings [14]. Currently short course palliative radiotherapy schedule is more favorable than single fraction or protracted course of radiation [15]. Various hypofractionated palliative radiotherapy schedules for locally advanced head and neck cancer with accepted outcome [5-7,11,16-18].

In this study , all patients had greater than 50% pain, dysphagia, hoarseness of voice and dyspnea relief and 22/25 patients had greater than 50% decrease in the size of neck masses. Overall response rate was 72%. Acute radiation toxicities were mild, these finding in agreement to Ali et al. [19] and Mohanti et al. [11] studies as regard symptoms control but radiation toxicities were more in Mohanti et al. [11] study, which may be due to higher radiation dose per fraction, gave regimen 20 gray in 5 fractions.

Two palliative radiotherapy regimens were evaluated from PGI Chandigarh (30 Gy in 10 fractions for 25 patients and Quad Shot regimen for 15 patients). In the former study, all the 22 out of 25 patients had relief of pain which lasted for about 3 months [5]. In the last one, there were 50% objective response and 52% grade I, II mucositis [6].

A multicenter Australian study evaluated 35 patients treated with hypofractionated radiotherapy (30 gray in 5 fractions,2 fractions per week with 6 gray boost for limited volume disease) Overall response rate was 80% and symptom control were reported in 67% of assessable patients , these finding in agreement to our study. However, radiation toxicities (grade III mucositis and dysphagia were seen in 26% and 11% patients, respectively) were more in Australian study, that may be due to adding radiation boost [16].

The protocol leads to significant reduction in hospital stay time for patients and machine time for treatment. The present study clearly shows the relevance, benefit, and feasibility of hypofractionated short course radiotherapy in this condition.

## Conclusion

Short course of palliative radiotherapy may be offered for patients with inoperable locally advanced head and neck cancer, who are unsuitable for other anticancer measures as well as long course radiotherapy. Further large scale multicenter studies in this field are indicated.

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