International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Role of Radiotherapy in Survival Outcomes and Dysphagia Relief in Carcinoma Esophagus: A Retrospective Institutional Study

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Abstract: ***Introduction: Carcinoma esophagus is an aggressive cancer with poor outcomes due to late presentation. GLOBOCAN 2022 reports approximately 511,054 new cases and 445,391 deaths annually. The 5-year survival remains low, and squamous cell carcinoma is the predominant histology in India. Aims and Objectives: To assess overall survival (OS), disease-free survival (DFS), pathological complete response (pCR) in patients receiving neoadjuvant therapy followed by surgery, and dysphagia relief in carcinoma esophagus, and to compare outcomes across different treatment approaches. Materials and Methods: This retrospective study included 50 patients with histologically proven carcinoma esophagus treated with radical, neoadjuvant, adjuvant, or palliative intent. OS was calculated from diagnosis to death or last follow-up, and DFS from completion of definitive treatment to recurrence. pCR was assessed in patients undergoing neoadjuvant chemoradiotherapy followed by surgery. Dysphagia improvement was evaluated clinically during follow-up. Results: Most patients were above 45 years, with female predominance. Squamous cell carcinoma was the most common histology, and the lower thoracic esophagus including the gastroesophageal junction was the most frequently involved site. Median follow-up was 12.5 months. Overall median OS and DFS were 12.1 months and 8.3 months, respectively. In the radical treatment group (28 cases), 5 patients were alive at last follow-up, with median OS and DFS of 13.5 months and 11 months. In the neoadjuvant chemoradiotherapy group (19 cases), 10 underwent surgery, achieving pCR in 6/10. Among 9 patients who did not undergo surgery, 2 were alive and 7 had died during follow-up. Median OS and DFS were 13.5 months and 11 months. Dysphagia improved to Grade I among surviving patients. Conclusion: Radical treatment provided effective disease control, while neoadjuvant chemoradiotherapy followed by surgery showed favourable pathological response, highlighting differences between both treatment approaches.***

Keywords: esophageal cancer, survival outcome, neoadjuvant therapy, chemoradiotherapy and surgery, dysphagia relief

1. Introduction

Carcinoma of the esophagus is an aggressive malignancy and associated with poor prognosis due to late presentation and rapid disease progression. According to GLOBOCAN 2022 estimates, more than 500,000 new cases are diagnosed annually worldwide. In developing countries such as India, the majority of patients present with locally advanced disease. The two principal histological subtypes are squamous cell carcinoma and adenocarcinoma Squamous cell carcinoma remains the predominant subtype in the Indian population. Management of carcinoma esophagus requires a multidisciplinary approach. Radiotherapy plays an important role in several clinical settings including radical treatment, neoadjuvant chemoradiotherapy followed by surgery, adjuvant therapy, and palliation of symptoms such as dysphagia. Assessment of treatment outcomes at the institutional level provides valuable insight into disease patterns, treatment responses, and survival outcomes in routine clinical practice. The present study was undertaken to evaluate survival outcomes and relief of dysphagia in patients with carcinoma esophagus treated in our department.

Aim and Objectives

The primary aim of this study was to evaluate survival outcomes in patients with carcinoma esophagus treated at our institution.

The objectives of the study were:

1) To assess overall survival in patients with carcinoma esophagus receiving different treatment modalities.
2) To evaluate disease-free survival following treatment.
3) To determine pathological complete response in patients who underwent neoadjuvant chemoradiotherapy followed by surgery.
4) To assess improvement in dysphagia following treatment.
5) To compare outcomes between patients receiving radical treatment and those receiving neoadjuvant therapy followed by surgery

2. Materials and Methods

This retrospective study was conducted in the Department of Radiation Oncology at GSL Medical College, Rajamahendravaram. A total of 50 patients with histologically confirmed carcinoma esophagus treated between 2023 and 2024 were included in the study. Clinical records were reviewed to obtain information regarding patient demographics, tumor histology, tumor location, stage at presentation, treatment modality, survival outcomes, and symptom relief. Treatment was individualized based on disease stage and patient clinical condition. The treatment approaches included:

- Radical radiotherapy
- Neoadjuvant chemoradiotherapy followed by surgery
- Adjuvant radiotherapy
- Palliative radiotherapy

Overall survival (OS) was calculated from the date of diagnosis to the date of death or last follow-up.

Disease-free survival (DFS) was calculated from completion of treatment to the time of recurrence.

Pathological complete response (pCR) was assessed in patients who underwent surgery following neoadjuvant therapy.

Improvement in dysphagia was assessed clinically during follow-up visits.

3. Results

A total of 50 patients with carcinoma esophagus were included in the study.

Age Distribution: Most patients belonged to the older age group. Thirty-eight patients were above 45 years of age, seven patients were between 36 and 45 years, and five patients were between 25 and 35 years.

Histopathological Distribution: Squamous cell carcinoma was the most common histological subtype, observed in 44 patients. Adenocarcinoma was seen in five patients, while one patient had adenosquamous carcinoma. Among the squamous cell carcinoma cases, moderately differentiated squamous cell carcinoma was the most frequently observed subtype, followed by well-differentiated and poorly differentiated squamous cell carcinoma. Rare variants such as basaloid squamous carcinoma were also noted.

Tumor Location: The lower thoracic esophagus including the gastroesophageal junction was the most common site of tumor involvement. A number of patients had tumors involving the mid thoracic esophagus or the junction of the mid and lower thoracic segments, while a smaller number of patients had cervical or upper thoracic esophageal tumors.

Stage at Presentation: Most patients presented with advanced stage disease, with Stage III being the most common stage at diagnosis, followed by Stage II disease. A smaller proportion of patients presented with Stage IV disease.

Radical Treatment Group: Among the fifty patients included in the study, 27 patients received radical treatment. At the time of last follow-up, five patients in this group were alive. For the radical treatment group:

- Median disease-free survival was 11 months
- Median follow-up duration was 12.5 months
- Median overall survival was 13.15 months

Among the five surviving patients, the median follow-up duration was 16.8 months, and the median overall survival was 30.7 months.

Neoadjuvant Chemoradiotherapy Group

Nineteen patients received neoadjuvant chemoradiotherapy. At the time of follow-up, ten patients were alive.Among these nineteen patients, ten patients subsequently underwent surgery. Among those who underwent surgery, eight patients were alive at follow-up.

Pathological complete response (pCR) was observed in six patients. Among these six patients with pCR, five patients were alive, while one patient died during follow-up. One patient demonstrated complete response at the primary tumor site. For the entire neoadjuvant group:

- Median follow-up duration – 8.4 months
- Median overall survival – 22.1 months
- Median disease-free survival – 16.5 months
- Among patients who underwent neoadjuvant chemoradiotherapy followed by surgery, the median follow-up duration for the eight surviving patients was 18.5 months, and the median overall survival was 19.4 months.

Adjuvant and Palliative Treatment

Two patients received adjuvant radiotherapy, and both patients died during follow-up. Similarly, two patients received palliative radiotherapy, and both patients also died during follow-up.

Dysphagia Response: Most patients initially presented with severe dysphagia. Following treatment, significant improvement in dysphagia was observed among surviving patients, with many patients reporting improvement to mild dysphagia during follow-up.

4. Conclusion

Carcinoma esophagus continues to present at an advanced stage in the majority of patients in our population. Squamous cell carcinoma remains the predominant histological subtype, and the lower thoracic esophagus including the gastroesophageal junction is the most commonly involved site.

Radiotherapy plays an important role in both curative and palliative management of carcinoma esophagus. Radical radiotherapy provides meaningful disease control and symptomatic relief, while neoadjuvant chemoradiotherapy followed by surgery demonstrates favorable pathological response and encouraging survival outcomes in selected patients.

These findings emphasize the importance of a multimodality approach and individualized treatment planning in the management of carcinoma esophagus.

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