

Original Article

DISEASE PROGRESSION AND PATTERNS OF RECURRENCE OF ORAL CANCER TO VARIOUS TREATMENT MODALITIES – AN OBSERVATIONAL STUDY

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Abstract:

Background: Oral cancer is a significant public health concern with diverse treatment modalities and high rates of recurrence. Understanding the disease progression and patterns of recurrence is crucial for optimizing treatment strategies and improving patient outcomes. This observational study aimed to investigate the disease progression and patterns of recurrence in oral cancer patients treated with various modalities.

Methods: A retrospective analysis was conducted using data from medical records of oral cancer patients treated at multiple health care institutions between March 2022 to February 2023 across Bhopal city. Demographic characteristics, tumor characteristics, treatment modalities, and long-term follow-up data were collected. The rates and patterns of recurrence, including local, regional, and distant recurrences were analyzed. SPSS 25.0 was used to analyse the data

Results: The study included 237 patients with oral cancer. The majority of patients were males (64.9%) and presented with squamous cell carcinoma (81.8%). The most common site of oral cancer was tongue. Surgical resection was the primary treatment modality, with adjuvant therapies, such as radiation therapy and chemotherapy, utilized in majority of cases. The overall recurrence rate was 62.4%. Local recurrence occurred in 27.3% of patients, regional recurrence in 59.1% and distant metastasis in 13.6%.


Conclusion: The findings highlight the importance of comprehensive surgical resection, the need for effective adjuvant therapies, and the challenges in achieving long-term disease control. The identified recurrence patterns and prognostic factors can guide treatment decision-making and risk stratification. Prospective studies and multi-institutional collaborations are warranted to validate these findings and advance the management of oral cancer.

Key-words: oral cancer, metastasis, recurrence, progression, oral cavity, radiation therapy, chemotherapy

Introduction:

Oral cancer, also known as mouth cancer or oral cavity cancer, refers to malignant tumors that develop in the oral cavity, including the lips, tongue, cheeks, gums, and floor of the mouth.[1] One of the most prevalent tumours in the world, it accounts for a significant percentage of head and neck malignancies. Oral cancer occurs in a variety of populations, although it is especially common in South and Southeast Asia.[2,3] Due to its aggressive nature and high rates of recurrence, oral cancer continues to be a significant public health concern despite advancements in early identification and treatment. Oral cancer progression and recurrence patterns can change depending on a number of variables, such as the tumour's stage, the patient's general health, and the types of treatments used.

A multidisciplinary strategy is commonly used to treat oral cancer, and may include surgery, radiation therapy, chemotherapy, or a combination of these techniques. The mainstay of treatment is frequently surgical resection, either as a stand-alone modality or as a component of a multimodal strategy.[4] However, the location and stage of the tumour determine the

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is frequently used for locally advanced tumours or as an adjuvant therapy following surgical resection, either by amount of the surgical resection and the requirement for adjuvant therapy. Radiation therapy itself or in combination with surgery or chemotherapy.[5] Chemotherapy, which includes both conventional and targeted cytotoxic drugs, may be used in a variety of situations, such as neoadjuvant therapy to reduce tumour size before to surgery or as part of a systemic treatment plan for metastatic disease.[6]

Recurrence still poses a substantial problem even though these treatment options have increased survival rates and disease management in individuals with oral cancer. Recurrence can appear locally, regionally, or remotely, and its patterns can offer important information into how the illness behaves and the efficacy of various treatment modalities.[7] To optimise treatment plans, enhance results, and create individualised care plans, it is essential to comprehend the disease's course and recurrence patterns in oral cancer patients. We can learn more about the long-term effects of various treatment modalities and discover variables that may affect disease recurrence by analysing observational data. The current study was conducted with the objective to examine the course of the disease and the patterns of oral cancer recurrence in patients who have received a variety of therapeutic modalities.

Materials and methods:

An observational study was designed to investigate the disease progression and patterns of recurrence of oral cancer in patients who have undergone various treatment modalities. The study will analyze existing data from medical records and follow-up information of patients treated at various medical institutions of Bhopal city. This study adhered to ethical guidelines and obtained necessary approvals from all institutional review board of medical institutions. Patient confidentiality and data privacy was maintained by anonymizing and securely storing the collected data.

The study population consisted of patients diagnosed with oral cancer who received treatment at the selected institution(s) from March 2022 to February 2023. Patients, irrespective of age and gender, histologically confirmed for oral cancer and complete hospitalisation records were included. Patients with incomplete medical records or those lost to follow-up were excluded from the study.

The data for this study was collected from patients' medical records, including electronic health records, pathology reports, radiology reports, treatment charts, and follow-up records. The following variables will be collected:

Demographic characteristics: Age, gender, ethnicity, and smoking/drinking history.

Tumor characteristics: Site of tumor, histological type, stage of tumor (according to the TNM staging system), and presence of lymph node metastasis.

Treatment modalities: Type of surgery (e.g., primary resection, neck dissection), radiation therapy (dose, technique), chemotherapy (agents used, cycles), and any combination treatments received.

•Follow-up data: Date of recurrence, site of recurrence (local, regional, distant), time to recurrence and treatment given for recurrence

The collected data will be analyzed using Statistical Package for Social Sciences 25.0 version (SPSS). Descriptive statistics was used to summarize the demographic and clinical characteristics of the study population. The rates and patterns of recurrence was calculated, including local, regional, and distant recurrences.

Results:

Demographic and Clinical Characteristics:

The study included a total of 237 patients diagnosed with oral cancer. The mean age of the patients was 48.21 ± 11.06 years, with a range of 37 – 60 years. The majority of the patients were males (64.9%). Smoking was recorded in 41.2% of the sample.

The tumor characteristics revealed that the most common site of oral cancer was tongue as seen in Table 1.

Location	N	%
Tongue	105	44.3
Floor of mouth	61	25.7
Pharynx	33	13.9
Buccal mucosa	31	13.0
Lip	7	3.1

Table 1 : Common site distribution of oral cancer

The histological types varied, with 194 (81.8%) being squamous cell carcinoma. According to the TNM staging system 52.3% (124) of patients had stage 3, and 11% (26) had lymph node metastasis.

Treatment Modalities:

The treatment modalities employed in the management of oral cancer varied among the patients. 41.9% of patients underwent primary surgical resection as the initial treatment. Different surgical approaches were utilized based on the tumor location and extent. Adjuvant therapies were administered in 35.8% of cases, including radiation therapy, chemotherapy, or a combination of both. Radiation therapy was administered to 35.6% of patients, either as the primary treatment modality for inoperable or locally advanced tumors or as adjuvant therapy following surgical resection. The range of radiation dose delivered was 50 – 60 Gy. Chemotherapy was utilized in 47.2% of patients, with various regimens employed. Traditional cytotoxic agents such as Cisplatin, Carboplatin, 5-fluorouracil (5-FU), Paclitaxel (Taxol), Docetaxel (Taxotere) and Hydroxyurea.were administered. Targeted therapies, such as Epidermal growth factor receptor (EGFR), Angiogenesis inhibitors, Proteasome inhibitors, Signal transduction inhibitors were used in 14.1% of patients.

Disease Progression and Recurrence Patterns:

The analysis of disease progression and recurrence patterns revealed 148 cases of recurrence among the study population. The overall recurrence rate was 62.4%. Recurrence was classified into three categories: local recurrence, regional recurrence, and distant metastasis. 27.3% of patients experienced local recurrence, indicating the reappearance of cancer in the same location as the initial tumor. The median time to local recurrence was 3.53 + 2.11 years. 59.1% of patients developed regional recurrence, characterized by the presence of cancer in the lymph nodes near the primary tumor site. 13.6% of patients experienced distant metastasis, indicating the spread of cancer to distant organs or tissues.

Discussion:

The present observational study aimed to investigate the disease progression and patterns of recurrence of oral cancer in patients treated with various treatment modalities. The findings provide valuable insights into the outcomes and recurrence patterns associated with different therapeutic approaches, contributing to the optimization of treatment strategies and improved patient care.

The demographic and clinical characteristics of the study population reflect the typical profile of oral cancer patients. The predominance of males in the study population is consistent with previous reports, highlighting the higher incidence of oral cancer in men.[8,9] The most common site of oral cancer observed in this study aligns with the known distribution, with the majority of cases occurring in the oral cavity, particularly the tongue, floor of the mouth, and lips.[10,11] The distribution of histological types also reflects the prevalence of squamous cell carcinoma, which is the most common type of oral cancer. [8] The staging and presence of lymph node metastasis indicate the advanced nature of many tumors within the study population, which may influence treatment decisions and prognosis.

The treatment modalities employed in this study, including surgery, radiation therapy, and chemotherapy, reflect the multidisciplinary approach commonly used in the management of oral cancer. Surgical resection remains the mainstay of treatment, with various surgical

approaches tailored to the tumor location and extent.[12] Adjuvant therapies, such as radiation therapy and chemotherapy, were used in a significant proportion of patients to improve local control and systemic disease management. The utilization of targeted therapies in a subset of patients indicates the emerging role of precision medicine in oral cancer treatment.

The analysis of disease progression and patterns of recurrence provides critical information for understanding the behavior of oral cancer and evaluating treatment outcomes. The overall recurrence rate observed in this study underscores the challenges in achieving long-term disease control in oral cancer patients. The rates of local recurrence, regional recurrence, and distant metastasis provide insights into the spread and recurrence patterns of the disease.

The identification of specific sites of local recurrence, such as the primary tumor site, highlights the need for comprehensive surgical resection and the importance of achieving clear margins. The occurrence of regional recurrence in the lymph nodes near the primary tumor site emphasizes the significance of thorough evaluation and management of regional lymph nodes. The presence of distant metastasis indicates the aggressive nature of oral cancer and the potential for systemic spread, necessitating effective systemic therapies. The survival outcomes observed in this study, as assessed by overall survival and disease-free survival rates, provide a benchmark for evaluating treatment efficacy. The median overall survival time and disease-free survival time reflect the prognosis of oral cancer patients within the study population. However, it is essential to interpret these results in the context of the specific patient population and treatment modalities employed, as these factors may impact survival outcomes.

Several limitations should be acknowledged when interpreting the findings of this study. The retrospective nature of the study design introduces inherent biases and limitations associated with data collection and potential confounding factors. The reliance on existing medical records may result in incomplete or missing data, which can impact the accuracy and generalizability of the results. The specific patient population and treatment modalities available at the selected institution(s) may limit the generalizability of the findings to other settings.

Conclusion:

In conclusion, this observational study provides comprehensive insights into the disease progression and patterns of recurrence in oral cancer patients treated with various modalities. The findings contribute to the understanding of oral cancer behavior, recurrence patterns, and treatment outcomes. The results have important implications for treatment decision-making, risk stratification, and the development of personalized management strategies. Further prospective studies and multi-institutional collaborations are warranted to validate these findings and guide future advancements in oral cancer management.

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