

ORIGINAL RESEARCH

Assessment of dental rehabilitation and quality of life in oral cancer-treated patients: An original research

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ABSTRACT

Background: Oral cancer treatment can have a significant impact on patients' oral health and overall quality of life. This study aims to assess the effectiveness of dental rehabilitation in improving the quality of life of oral cancer-treated patients.

Methods: A retrospective analysis of medical records was conducted. Patients who received dental rehabilitation following oral cancer treatment were identified. Dental rehabilitation interventions included prosthetic rehabilitation, dental implant placement, and oral rehabilitation therapy. Quality of life was assessed using the EORTC QLQ-C30 and OHIP-14 instruments. Statistical analysis included descriptive statistics and multivariate regression models.

Results: The study included 238 patients with a mean age of 57.4 years. Prosthetic rehabilitation, dental implant placement, and oral rehabilitation therapy were associated with significant improvements in EORTC QLQ-C30 and OHIP-14 scores. For example, EORTC QLQ-C30 scores increased from 52.6 to 71.2 following prosthetic rehabilitation. OHIP-14 scores decreased from 28.4 to 14.7. Similar improvements were observed in other rehabilitation categories.

Conclusion: Dental rehabilitation plays a pivotal role in enhancing the quality of life of oral cancer-treated patients. These interventions significantly improve functional aspects and psychosocial well-being, highlighting the importance of comprehensive oral care in the management of oral cancer.

Keywords: dental rehabilitation, quality of life, oral cancer, treatment outcomes, patient satisfaction

INTRODUCTION

Oral cancer is a formidable challenge in the field of oncology, characterized by its high incidence, aggressive nature, and the profound impact it has on patients' physical and psychological well-being. Despite advances in early detection and treatment, oral cancer continues to exact a heavy toll on those affected, significantly affecting their quality of life [1]. This study delves into the complex interplay between oral cancer treatment, dental rehabilitation, and the quality of life of patients who have faced the daunting journey of battling this disease.

Oral cancer encompasses a range of malignancies affecting the mouth, including the lips, tongue, cheeks, and palate, and often manifests as squamous cell carcinoma. It ranks as one of the most common malignancies globally, with a higher prevalence in regions where tobacco and alcohol consumption are prevalent [2]. Additionally, human papillomavirus (HPV) infection has emerged as a risk factor for oral cancer, contributing to a shift in the demographics of affected patients, with an increasing number of younger individuals affected [3]. This change in patient demographics and risk factors underscores the evolving nature of this disease.

The treatment of oral cancer is multimodal, involving surgery, radiation therapy, chemotherapy, and immunotherapy, either as single or combined modalities. While these treatments have improved overall survival rates, they often come at the cost of significant morbidity. Surgical resection of tumors can lead to disfigurement, loss of speech, and impaired mastication and swallowing. Radiation therapy, while effective at eradicating cancer cells, can damage adjacent tissues, including salivary glands and oral mucosa, leading to xerostomia and mucositis. Chemotherapy adds to the burden of side effects, including fatigue, nausea, and immunosuppression [4]. These adverse effects on oral health, in particular, have profound implications for the overall well-being of patients.

Dental health, in the context of oral cancer, is a critical but often underemphasized aspect of patient care. The treatment-induced oral complications can significantly impact a patient's ability to eat, speak, and maintain proper oral hygiene. Xerostomia, or dry mouth, is a common sequelae of radiation therapy and can result in dental caries and mucositis. Furthermore, tooth loss due to surgical resection or decay further exacerbates these issues. The functional limitations and compromised aesthetics that arise from these oral complications can lead to psychological distress, reduced self-esteem, and an impaired quality of life [5-10].

To address these oral health challenges, dental rehabilitation emerges as a critical intervention. Dental rehabilitation encompasses a range of procedures aimed at restoring and maintaining oral function and aesthetics, including prosthetic rehabilitation, implant placement, and oral rehabilitation therapy. Prosthetic rehabilitation, often involving the fabrication of partial or complete dentures, is crucial for restoring masticatory function and speech. Dental implants, with their potential for improved stability and function, have become a cornerstone in oral cancer rehabilitation [6-8]. Oral rehabilitation therapy, including speech and swallow therapy, plays a pivotal role in restoring functional aspects of oral health.

The link between dental rehabilitation and quality of life in oral cancer-treated patients is a topic of growing interest. A burgeoning body of evidence suggests that effective dental rehabilitation can mitigate the oral complications associated with cancer treatment and significantly enhance patients' overall well-being. Dental rehabilitation not only restores oral function but also plays a role in improving patients' self-esteem, social interactions, and psychological health.

This study aims to systematically assess the outcomes of dental rehabilitation in oral cancer-treated patients, shedding light on the extent to which these interventions improve their quality of life. By examining the existing literature and conducting our analysis, we endeavor to provide a comprehensive view of the impact of dental rehabilitation on the lives of those who have battled this debilitating disease. Our objectives are to explore the effectiveness of dental rehabilitation, identify the factors influencing its success, and investigate the patient-reported outcomes, ultimately providing valuable insights for clinicians and patients alike. In the following sections, we will detail our methodology, present our results, and engage in a robust discussion, comparing our findings to existing literature on the subject. By the conclusion of this research, we aim to offer a compelling argument for the integration of dental rehabilitation as an integral part of the holistic care of oral cancer-treated patients. Our study holds the potential to illuminate a path toward improved quality of life for those who have faced the formidable challenges of oral cancer treatment.

MATERIALS AND METHODS

Study Design: This study was designed as a retrospective observational analysis of oral cancer-treated patients who received dental rehabilitation. The study aimed to investigate the outcomes of dental rehabilitation interventions and their impact on the quality of life of these patients. Ethical approval was obtained from the Institutional Review Board to access and analyze patient records. Informed consent was waived due to the retrospective nature of the study.

Patient Selection: The study population included all adult patients with a history of oral cancer who received dental rehabilitation at tertiary care center from 2021-2022. Inclusion criteria encompassed patients who had undergone surgical treatment, radiation therapy, or chemotherapy for oral cancer and had subsequently received dental rehabilitation. Patients with incomplete records or those who had not undergone dental rehabilitation were excluded from the analysis.

Data Collection: Patient data were retrieved from electronic medical records, which included demographic information, cancer staging, treatment history, dental rehabilitation procedures, and quality of life assessments. The following data were collected:

1. Demographic Information: Age, gender, and smoking/alcohol history.
2. Cancer Staging: Tumor stage, nodal involvement, and presence of metastases.
3. Treatment History: Type of cancer treatment (surgery, radiation, chemotherapy, or a combination), and dates of treatment.
4. Dental Rehabilitation: Details of rehabilitation procedures, including prosthetic rehabilitation, dental implant placement, and oral rehabilitation therapy.
5. Quality of Life Assessment: Patients' self-reported quality of life scores using validated instruments, including the EORTC QLQ-C30 (European Organization for Research and Treatment of Cancer Quality of Life Questionnaire - Core 30) and OHIP-14 (Oral Health Impact Profile - 14). These assessments were conducted both before and after dental rehabilitation.

Statistical Analysis: Statistical analysis was carried out using IBM SPSS Statistics (version 25). Descriptive statistics, including mean, standard deviation, and frequency, were used to summarize patient demographics, cancer staging, treatment history, and dental rehabilitation procedures.

To explore the relationship between dental rehabilitation and quality of life, we employed multivariate regression models. The quality of life scores, as measured by the EORTC QLQ-C30 and OHIP-14, were the dependent variables, while dental rehabilitation procedures and other covariates were included as independent variables. Covariates included age, gender, smoking/alcohol history, cancer staging, and treatment modalities.

Furthermore, we performed subgroup analyses to assess whether specific dental rehabilitation procedures (prosthetic rehabilitation, implant placement, or oral rehabilitation therapy) had differential effects on quality of life outcomes. This analysis allowed us to determine which interventions had the most substantial impact on patients' well-being.

Results were considered statistically significant if p-values were less than 0.05, and 95% confidence intervals were calculated for effect size estimates.

Limitations: This retrospective study had several limitations, including potential selection bias due to the exclusion of patients with incomplete records. Additionally, the reliance on retrospective data and self-reported quality of life assessments could introduce recall bias. Despite these limitations, the study provides valuable insights into the role of dental rehabilitation in the quality of life of oral cancer-treated patients.

RESULTS

Table 1: Demographics and Baseline Characteristics of Study Population

Characteristic	Value
Total Patients	238
Age (years, mean \pm SD)	57.4 \pm 9.2
Gender (Male/Female)	172/66
Smoking History	138 (57.9%)
Alcohol History	105 (44.1%)

Table 1 presents the demographics and baseline characteristics of the study population. The average age of patients was 57.4 years (\pm 9.2), with a predominance of males (n=172) over females (n=66). A majority of patients had a history of smoking (57.9%), and a significant proportion had a history of alcohol consumption (44.1%).

Table 2: Cancer Staging and Treatment Modalities

Characteristic	Value
Tumor Stage (I/II/III/IV)	42/68/75/53
Nodal Involvement (Yes/No)	82/156
Metastases (Yes/No)	19/219
Treatment Modality	
- Surgery	126 (52.9%)
- Radiation	183 (76.9%)
- Chemotherapy	75 (31.5%)

Table 2 outlines the cancer staging and treatment modalities of the study population. Tumor stage distribution showed a relatively balanced representation across stages I-IV. Nodal involvement was present in 82 patients, while metastases were observed in 19 patients. Surgery was performed in 52.9% of cases, radiation therapy in 76.9%, and chemotherapy in 31.5%.

Table 3: Dental Rehabilitation Procedures and Quality of Life Scores

Rehabilitation Procedure	Patients (n)	EORTC QLQ-C30 (Baseline)	EORTC QLQ-C30 (Post-Rehab)	OHIP-14 (Baseline)	OHIP-14 (Post-Rehab)
Prosthetic Rehabilitation	107	52.6 \pm 8.4	71.2 \pm 6.7	28.4 \pm 4.9	14.7 \pm 3.2
Implant Placement	63	53.8 \pm 7.1	73.4 \pm 7.9	29.2 \pm 5.6	13.9 \pm 3.7
Oral Rehabilitation	68	55.2 \pm 6.3	74.9 \pm 6.5	30.8 \pm 5.1	13.1 \pm 4.0

Therapy					
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Table 3 provides data on dental rehabilitation procedures and the corresponding quality of life scores. Patients who underwent prosthetic rehabilitation demonstrated significant improvements in EORTC QLQ-C30 scores, with a mean baseline score of 52.6 (± 8.4) increasing to 71.2 (± 6.7) post-rehabilitation. Similarly, OHIP-14 scores improved from 28.4 (± 4.9) to 14.7 (± 3.2). For patients who received implant placements, EORTC QLQ-C30 scores improved from 53.8 (± 7.1) to 73.4 (± 7.9), and OHIP-14 scores improved from 29.2 (± 5.6) to 13.9 (± 3.7). Patients undergoing oral rehabilitation therapy showed improvements in EORTC QLQ-C30 scores, from 55.2 (± 6.3) to 74.9 (± 6.5), and OHIP-14 scores, from 30.8 (± 5.1) to 13.1 (± 4.0).

Findings: The analysis of the study population revealed several key findings:

Demographics and Baseline Characteristics: The average age of patients was approximately 57.4 years, with a male predominance. A substantial proportion of patients had a history of smoking (57.9%) and alcohol consumption (44.1%).

Cancer Staging and Treatment Modalities: Tumor staging was distributed across all stages (I-IV), and a significant number of patients exhibited nodal involvement and a smaller number had metastases. Surgery was the primary treatment modality in 52.9% of cases, with radiation therapy and chemotherapy also being common components of treatment.

Dental Rehabilitation Procedures and Quality of Life: Dental rehabilitation procedures, including prosthetic rehabilitation, implant placement, and oral rehabilitation therapy, showed notable improvements in patient-reported quality of life scores. In all three categories, EORTC QLQ-C30 and OHIP-14 scores improved substantially after rehabilitation.

Prosthetic rehabilitation resulted in a marked increase in EORTC QLQ-C30 scores from 52.6 to 71.2 and a significant reduction in OHIP-14 scores from 28.4 to 14.7. Patients who received dental implants experienced similar improvements, with EORTC QLQ-C30 scores rising from 53.8 to 73.4 and OHIP-14 scores decreasing from 29.2 to 13.9. Oral rehabilitation therapy also yielded improvements, with EORTC QLQ-C30 scores increasing from 55.2 to 74.9 and OHIP-14 scores decreasing from 30.8 to 13.1.

These findings underscore the positive impact of dental rehabilitation on the quality of life of oral cancer-treated patients, highlighting the potential benefits of comprehensive oral care as part of their treatment and recovery.

DISCUSSION

Our study investigated the critical relationship between dental rehabilitation and the quality of life of oral cancer-treated patients, shedding light on the potential benefits of comprehensive oral care within the context of cancer treatment and recovery. The findings of our analysis suggest a positive impact of dental rehabilitation on patients' quality of life, adding to the growing body of evidence supporting the importance of holistic care for individuals who have faced the challenges of oral cancer treatment.

Impact of Dental Rehabilitation on Quality of Life:

One of the central findings of our study is the substantial improvement in patients' quality of life following dental rehabilitation. The patient-reported outcomes, as measured by the EORTC QLQ-C30 and OHIP-14 instruments, provide a comprehensive view of this improvement. These findings align with previous research highlighting the negative consequences of oral cancer treatment on patients' well-being, such as functional limitations, disfigurement, and psychosocial distress [1,11,12].

The improvement in EORTC QLQ-C30 scores signifies that dental rehabilitation contributes to a more positive overall quality of life. Patients who underwent prosthetic rehabilitation, implant placement, or oral rehabilitation therapy reported significant increases in their

physical, emotional, and social well-being. The ability to eat, speak, and smile comfortably plays a fundamental role in patients' self-perception and social interactions [2,11-15].

Furthermore, the reduction in OHIP-14 scores indicates a decrease in the impact of oral health issues on patients' daily lives. The decrease in oral health-related discomfort, dysfunction, and disability highlights the importance of addressing these issues through dental rehabilitation [3,11-15]. This not only improves functional aspects but also leads to psychological benefits, including increased self-esteem and overall satisfaction with oral health.

Our findings are consistent with existing literature that underscores the significance of dental rehabilitation in enhancing the quality of life of oral cancer-treated patients. Several studies have demonstrated the positive impact of prosthetic rehabilitation, dental implant placement, and oral rehabilitation therapy on patients' well-being.

Prosthetic rehabilitation, which often involves the fabrication of partial or complete dentures, has shown to be effective in restoring masticatory function and speech. Previous research has reported improved oral function, aesthetics, and overall patient satisfaction following prosthetic rehabilitation [4,15]. This is well reflected in our study, where patients undergoing prosthetic rehabilitation exhibited significant improvements in both EORTC QLQ-C30 and OHIP-14 scores.

Dental implant placement has become a cornerstone in oral cancer rehabilitation. Implants provide a stable foundation for dental prostheses and can significantly enhance the function and aesthetics of the oral cavity. Studies have indicated that dental implants improve masticatory function, speech, and patient satisfaction, all of which contribute to an improved quality of life [15]. Our results mirror this pattern, with patients who received dental implants demonstrating substantial improvements in quality of life scores.

Oral rehabilitation therapy, encompassing speech and swallow therapy, plays a vital role in restoring functional aspects of oral health. These therapies have been shown to improve speech intelligibility, swallowing function, and patient-reported outcomes [6]. In our study, patients who underwent oral rehabilitation therapy reported significant enhancements in both EORTC QLQ-C30 and OHIP-14 scores, underscoring the value of these therapies in improving patients' lives.

Implications for Clinical Practice:

The findings of our study have important implications for clinical practice. Oral cancer treatment is multifaceted, and healthcare providers should consider the broader impact of treatment on patients. The integration of dental rehabilitation into the comprehensive care of oral cancer-treated patients is crucial.

Dental rehabilitation should be regarded as an essential component of the multidisciplinary care team, working alongside oncologists and other healthcare professionals. The results of our study emphasize the importance of evaluating patients for dental rehabilitation needs early in the treatment process. A proactive approach to addressing oral health issues can mitigate the negative consequences of treatment, prevent complications, and improve patients' well-being.

Furthermore, patient education and communication regarding the benefits of dental rehabilitation are essential. Many patients may not be aware of the potential for dental rehabilitation to enhance their quality of life. Clinicians should be equipped to discuss the options available and the potential outcomes with their patients, encouraging them to make informed decisions regarding their oral health.

Study Limitations:

It is important to acknowledge the limitations of our study. The retrospective nature of the analysis may introduce selection bias, as patients with incomplete records were excluded. Additionally, the use of self-reported quality of life assessments may be subject to recall bias,

as patients may not accurately recall their pre-rehabilitation status. Prospective studies with larger, more diverse populations and longer follow-up periods may provide more robust evidence of the benefits of dental rehabilitation.

CONCLUSION

In conclusion, our research has provided valuable insights into the relationship between dental rehabilitation and the quality of life of oral cancer-treated patients. Dental rehabilitation, including prosthetic rehabilitation, implant placement, and oral rehabilitation therapy, significantly improved patient-reported quality of life, addressing the functional and psychosocial challenges posed by oral cancer treatment.

The integration of dental rehabilitation as an integral component of the holistic care of oral cancer-treated patients can lead to enhanced well-being, improved self-esteem, and better overall satisfaction with oral health. This study highlights the importance of early assessment and intervention to address oral health issues and underscores the need for increased patient education and communication on the potential benefits of dental rehabilitation.

Ultimately, our research contributes to a growing body of evidence supporting the importance of comprehensive oral care in the management of oral cancer, offering a path toward an improved quality of life for those who have faced the formidable challenges of this disease.

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