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Maxillofacial prosthesis's effect on oral hygiene and oral health related quality of life of patients in a population of Pakistan

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Abstract---Background and Aim: Dental malformations caused by surgical excision of oral cancerous tissues cause physical, functional and aesthetic problems. Congenital disorders or acquired factors are regarded as the major causes for maxillofacial defects. The purpose of the current investigation was to determine the effect of maxillofacial prosthesis on oral hygiene and oral health related life quality of life of patients in a population of Pakistan. Materials and Methods: This prospective study was conducted on 28 maxillofacial defects' bearing patients investigated in the Department of Dentistry at a Tertiary Care

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Hospital in Lahore, Pakistan from January 2021 to December 2022. Hearing as well as visually impaired and edentulous patients were excluded from the study. Oral Health Impact Profile (OHIP) was used for the assessment of Oral Health related Quality of Life (OHR QoL). The OHR-QoL was assessed by a self-administered questionnaire. “Functional limitation (9 items)”, “Physical pain (9 items)”, “Psychological discomfort (5 items)”, “Physical disability (9 items)”, “Psychological disability (6 items)”, “Social disability (5 items)”, and “Handicap (6 items)” were 7 subscales of OHR-QoL recorded in each questionnaire and a greater OHR-QoL impairment was an indicative of a higher overall OHIP score. Results: Out of 28 maxillofacial defects’ bearing patients, there were 15 (53.6%) male and 13 (46.4%) female patients. The overall mean age was 68 (64–76.5) years. The incidence of maxillary and mandibular defects were 21 (75%) and 7 (25%) respectively. There was a substantial change (p = 0.0001) between "pre-OHIP" and "post-OHIP" values before and after the use of maxillofacial prosthesis respectively. This result indicated that following the use of a maxillofacial prosthesis, it ultimately led to an improved OHR-QoL. Conclusion: Maxillofacial prosthetic therapy can enhance patients' OHR-QoL. "Age" and "Occlusal Units (OUs)" were related with a better OHR-QoL. Regardless of the patients' characteristics, oral hygiene maintenance training and oral health care follow up might enhance their overall oral hygiene status.

Keywords---maxillofacial prosthesis, oral health related quality of life, oral hygiene instructions.

Introduction

Dental malformations caused by surgical excision of oral cancerous tissue causes physical, functional and aesthetic problems in an individual. Congenital disorders or acquired factors are the major causes for these maxillofacial defects. The two primary criteria that were identified as acquired defects were orofacial trauma and surgery for tumors. These flaws have a substantial impact on the anatomic components of the maxillofacial area [1]. Fluid leakage, nasal noises, nasal regurgitation, and difficulty in chewing are all symptoms of post-surgical maxillary abnormalities. These functional issues may have an impact on the oral health-related quality of life of a patient [2, 3]. Durable obturator prosthesis is required to restore the shape of the resected region and to recreate the functional separation of the nasal and oral chambers. It immediately improves speech intelligibility, voice resonance and swallowing processes [4]. One of the most difficult obstacles for maxillofacial prosthodontists in achieving recovery from these disorders is the disease's frequency and cost limits. These issues are commonly associated with functional, physical, psychological and cosmetic deficits [5]. A classification system should be dependable, logical, and should categorize problems based on their rehabilitative requirements. In one instance for example, the primary focus of their categorization was on palatal defect extension and stability for effective obturator retention [6].

Oral cancers, various congenital deformities and trauma all cause multiple maxillofacial defects that can affect oral functions and facial appearances [7, 8]. These defects might be corrected with maxillofacial prosthesis or surgical reconstruction for aesthetic and functional recovery [9]. The defect's magnitude, site and the surviving edifices can all play a role in choosing the best strategy of reconstruction [10, 11]. Historically, maxillofacial prosthesis had been used as a surgical reconstructive option and had been demonstrated to improve oral function and quality of life (QoL) [12, 13]. The restoration through a maxillofacial prosthesis is a non-invasive procedure. Oral complications such as mucositis, periodontitis and dental caries can be prevented by self-care and sustaining maxillofacial prosthesis in excellent conditions regarding OHR-QoL. Patients should be given proper oral hygiene guidelines in order to maintain good dental health. It has been showed previously as well that several patients improved their oral hygiene as a consequence of teaching, particularly in relation to the adaptation to their maxillofacial prosthesis. The purpose of the current investigation was to determine the effect of maxillofacial prosthesis on oral hygiene and oral health related life quality of patients in a population of Pakistan.

Methodology

This prospective study was conducted on 28 maxillofacial defects' bearing patients investigated in the Department of Dentistry at a Tertiary Care Hospital in Lahore, Pakistan from January 2021 to December 2022. Hearing as well as visually impaired and edentulous patients were excluded from the current study. Oral Health Impact Profile (OHIP) was used for the assessment of Oral Health related Quality of Life (OHR QoL). The OHR-QoL was assessed by a self-administered questionnaire. "Functional limitation (9 items)", "Physical pain (9 items)", "Psychological discomfort (5 items)", "Physical disability (9 items)", "Psychological disability (6 items)", "Social disability (5 items)", and "Handicap (6 items)" were the 7 subscales of OHR-QoL recorded in each questionnaire and a greater OHR-QoL impairment was an indicative of a higher overall OHIP score. Prior to maxillofacial prosthesis therapy, OHIP scores were referred to as "pre OHIP." "Post OHIP" scores were defined as those obtained at least one month after adjusting maxillofacial prosthesis. Statistical package for social sciences (SPSS) version 27 was used for data analysis. The Wilcoxon signed rank test was used to make the comparisons between "pre" and "post" OHIP or Plaque Control Record (PCR) values. Spearman's rank correlation coefficient was used to calculate correlations between OHIP and PCR scores. Spearman's rank correlation coefficient was also used to examine the associations between OHIP, age, occlusal support and PCR.

Results

Out of 28 maxillofacial defects' bearing patients, there were 15 (53.6%) male and 13 (46.4%) female patients. The overall mean age of the patients was 68 (64–76.5) years. The incidence of maxillary and mandibular defects were 21 (75%) and 7 (25%) respectively. There was a substantial change (p = 0.0001) between "pre-OHIP" and "post-OHIP" values which indicated that following maxillofacial prosthesis therapy, OHR-QoL improved. Also, there was observed a statistically significant variance between "pre PCR" and "post PCR" values as well. The

difference in OHIP and PCR scores (post-pre OHIP or PCR) was computed by subtracting "post score" from "pre score".

The patient's profiles' are shown in (Table-I). There were statistically significant correlations detected between "Pre, Post & Post-Pre - OHIP" and age, residual teeth, occlusal support and occlusal units of patients as indicated in (Table-II).

Table I
Patient's profiles'

Variables	Values
Age (years)	68 (64–76.5)
Gender (n) (%) Males Females	 15 (53.6%) 13 (46.4%)
Residual teeth	16 (12–22.5)
Occlusal Units	4 (1–8)
Defects Maxillary Mandibular	 21 (75%) 7 (25%)

Table II
Correlations detected between "Pre, Post & Post-Pre - OHIP" and age, residual teeth, occlusal support and occlusal units of patients

Variables	Age	Residual teeth	Occlusal support	Occlusal Units
Pre-OHIP	−0.2543	0.3226	0.3263	0.4563
Post-OHIP	0.2321	0.1816	0.2381	0.1175
Post-Pre OHIP	0.4132	−0.3139	−0.3029	−0.5236

Discussion

The current study primarily focused on OHR-QoL of patients after the utilization of maxillofacial prosthesis and our data clearly revealed that maxillofacial prosthesis therapy might considerably enhance the overall OHR-QoL as measured by OHIP. Previous research has suggested that residual dentition and age especially Occlusal Units (OUs) frequency might have an impact on oral functioning and it's associated QoL [14-17]. Radiotherapy has been identified as a variable factor influencing QoL or OHR-QoL [18, 19]. Our results, however, revealed that radiation was not a possible factor affecting OHR-QoL. Cattoni et al. reported that postoperative irradiation might not affect the QoL [20]. Similarly, Ferrini et al., [21] quoted that the majority of patients got a postoperative radiation as an adjuvant treatment option in their research. Additionally, bacterial and fungal infections, xerostomia, and oral mucositis are the most common side effects of radiation. Professional dental care has been shown to alleviate these symptoms to some extent [21, 22].

As previously stated, the oral hygienic care of the maxillofacial prosthesis is important to improve the overall oral functions [23, 24]. Nevertheless, little is

known regarding the oral hygiene training benefits on the oral health of people with craniofacial abnormalities. The current study showed that training of oral hygiene can considerably enhance PCR scores of these patients after discharge from the hospital. As a result of this observation, oral hygiene teaching can be regarded as a successful parameter in establishing the oral self-care ultimately. Surgical errors made during oral cancer surgery can impede with lip closure due to anterior tooth disharmony and it can lead to consequences such as improper intraoral negative pressure creation and enlargement of the tongue gap thus causing issues in the preservation of the overall maxillofacial structure and its proper functioning [25, 26].

This can also have an impact on the swallowing function of the patient. The patient's swallowing function was seen to be improved significantly ($p = 0.05$) after maxillofacial prosthesis rehabilitation, according to a comparison done via pre and post dysphagia scores. This research however did not include any individuals with tongue, lip or soft palate problems. Maxillofacial prosthesis (MFP) in general restores lost tissue and tooth structure, hence enhancing face shape and oral functioning. There were no significant changes in OHIP items linked to "becoming a little annoyed with other people" and "having difficulties doing your normal work". This is consistent with the findings of Mehmet et al. [27] and Joseph et al. [28] who found that patients who experienced growing difficulty with MFP's functioning reported higher illness impact, sadness, loss of behavior or emotional control and a decreased positivity.

The use of prosthesis that replaces soft and hard tissues improves morbidity and recovery time. These maxillofacial prosthetics take time and skill to meet the patient's functional and aesthetic goals. Advanced techniques like computer-aided design and machining, implant-supported prosthesis, three-dimensional printing, and digital imaging can be tailored to meet these demands. [29, 30] Digital oral imprints can shorten the production time and procedures, boosting patient's acceptability and correctly mimics patient's features. As a result, these might be regarded as a feasible and dependable alternative to traditional procedures of MFP construction [31, 32]. The limitation of our study was that preoperative PCR scores would have had an impact on the postoperative PCR scores but they were not investigated in the current study. Apart from this our study was based on a limited sample size which can be explored further in successive longitudinal studies. More research would be required to investigate the variables that influence OHR-QoL and oral hygiene conditions in patients with craniofacial abnormalities.

Conclusion

Maxillofacial prosthetic therapy can enhance patients' OHR-QoL. "Age" and "OUs" were connected to a better OHR-QoL. Regardless of the patients' characteristics, oral hygiene training and oral care might enhance their overall oral hygiene status.

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