Content available at: https://www.ipinnovative.com/open-access-journals

IP Annals of Prosthodontics and Restorative Dentistry

Journal homepage: https://www.aprd.in/

Original Research Article

Assessment of quality of life in maxillectomy patients rehabilitated with obturator prosthesis

Divya Mittal[1], Parag Dua[1]*, Thiruvalluvan Nagarajan[1], Saurav Kumar[1], Navdeep Singh[1], Sonam Yangchen[1]

[1]Dept. of Dental Surgery and OHS, Armed Forces Medical College, Pune, Maharashtra, India

Abstract

Aim: To perform subjective evaluation of the oral health related changes in quality of life, using three QoL scales, in maxillectomy patientsrehabilitated with obturator prosthesis.

Materials and Methods: Questionnaire based prospective study involving 38 patients, of age group 39-72 years, who have undergonemaxillectomy due to various reasons, reported to the Dept. of Prosthodontics for rehabilitation, were enrolled for the study. After requisite informed consent for participation in the study, the base line data for QoL using 3 scales, i.e.a) University of Washington Quality of Life (UW-QoL), b) Obturator functioning scale (OFS), c)Maxillofacial Prosthesis Performance Scale (MFPPS) were recorded,followed by prosthetic rehabilitation with maxillary obturators. The patients were subjected to the scales again at 7 days and 30 days post-rehabilitation. Questionnaire included 37 questions related to the patient's physical health, well-being, psychological status and social involvement in the day-to-day life. The collated data was statisticallyevaluated using statistical package for social science (SPSS). Probability level of P<.05 was considered statistically significant.

Results: There was an overall improvement in the index of quality of life subsequent to rehabilitation with maxillary obturator. The findings of the study become validated with more firmity when the marked improvement in Quality of life is observed with all the three scales used in the study. When measured with UW-QoL scale, mean overall increase was 62.08 units in quality of life post prosthetic rehabilitation. Positive adaptive responses towards the obturator were observed as the time span of its usage by the patient increased from the initial post insertionvisit (mean value: 61.5) to follow up visit after 30 days (mean value: 72.1) with OFS scale.The results were statistically significant. While using MFPPS Scale, statistically significant results were obtained in terms of chewing efficiency and better swallowing of foods.

Conclusion: Quality of life improved after prosthetic rehabilitation of patients who had undergone maxillectomy in terms of physical and psychological well-being. Positive adaptive responses were observed with increased usage of prosthesis after 30 days follow up.

Keywords: Maxillectomy, Obturator prosthesis, Quality of Life, UW-QoL, OFS, MFPPS.

Received: 01-04-2025; **Accepted** 13-05-2025; **Available Online**: 20-06-2025

1. Introduction

Orofacial trauma, Orofacial Carcinomas and Post-CovidMucormycosis are amongst the most common causes for the acquired defects in oral and maxillofacial region.[1,2] Post-surgical maxillary defects lead to functional impairments such as fluid leakage both from nasal and oral cavity, nasal twang,regurgitation from nasal cavity and compromised mastication.[1-3] These functional problems significantly affect quality of life (QoL) of the patients.

The WHO defines quality of life as the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It also encompasses the aspects of physical wellbeing, personal wellbeing, social, functional activities and economic influences.[4] Maxillectomy has serious implication on all these aspects of life and alter the QoL of the patients. However, maxillary obturators have played a significant role in re-establishing the form of the resected portion and in reconstructing the functional separation of nasal and oral

*Corresponding author: Parag Dua
Email: drmittal.divya@gmail.com

https://doi.org/10.18231/j.aprd.2025.028

cavities, thereby restoring of oro-nasal functions while maintaining the facial contours. It also provides improvement in speech intelligibility, the resonance of voice and masticatory capabilities. The removable obturator prosthesis apart from improvements in the QoL of patients, offers the possibility of immediate rehabilitation with easy facilitation of examination of the surgical site after removing the prosthesis.[5-7] Patients suffering from maxillary defects, after prosthetic rehabilitation, develop coping strategies and demonstrate improvement in QoL.

Various studies have quantified this improvement in QoL using various scales. Kalaignanand Ahmed,[1] Chen et al[8] and Chigurupati et al[11] utilized the Obturator Functional Scale (OFS), while Warriach,[13] Chen et al.[8] and Breeze et al[10] used UW-QOL scale. Also MFPPS scale was used by (Chigurupati et al.[11] Riazand Warriach[13] Chen et al.[8]) to evaluate the QoL of maxillectomy patients rehabilitated with obturators. However, there is a lacuna in the literature of a study utilizing all the three commonly used scales to evaluate the QoL in maxillectomy patients covering all the aspects of rehabilitation.

Obturator functioning can be assessed both objectively and subjectively. Objective assessment is performed by the operator and requires the use of advanced scientific equipment. Subjective assessment means the evaluation of the function of prosthesis from patient's point of view. The latter is more frequently used because of its simplicity and low cost.[6,7] The objective of the present study was to perform subjective evaluation and assess the changes in quality of life in maxillectomy patients after prosthetic rehabilitation of the affected area and to assess the adaptive responses of patients after the continuous usage of obturator for 30 days using three different commonly used scales.

2. Materials and Methods

This study was conducted at multiple tertiary care dental centers in India from July 2022 to July 2023. The inclusion criteria involved the patients who had undergone maxillectomy followed by prosthetic rehabilitation with obturator prosthesis, patients being rehabilitated for the first time, age group 35-75, both male & female. Exclusion criteria involved: patients with mandibular defects along with maxillary defects, Implant retained prostheses, old patients with second prosthesis. Total of 52 patients was assessed for the study, out of them 38 patients fulfilled the inclusion criteria and were subjected to the study. The patients were in the age group of 39-72 years. Informed consent was obtained for all participating patients. Ethical approval was obtained from the institutional ethics committee.

The OHR-QoL was evaluated by means of the UW-QoL (Questionnaire 1), OFS (Questionnaire 2) and MFPPS (Questionnaire 3). UW-QoL assessed the parameters for quality of life pre and post prosthetic rehabilitation. OFS and MFPPS assessed the quality of life with a standardized questionnaire after 7 days and 30 days of prosthesis insertion. Patients were asked a series of questions by using all the three scales, related to patient's physical health, wellbeing, psychological status, social relation and environmental conditions.[5] Patients were interviewed in person.

University of Washington Quality of Life (UW-QoL) scale consisted of 12 single question domains. The domains were pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste, saliva, mood and anxiety. The UW-QoL had domains based upon discrete ordinal responses. Scoring was scaled inequal stages from 0(i.e. worst response) to 100(i.e. best response) to reflect the number of possible responses. Thus, every domain had 5 possible responses which were scored as 0, 25, 50, 75 & 100.[6]

Obturator functioning scale OFS scale involved the responses to 15 questions that are scaled evenly from 0 (worst) to 100 (best) according to the hierarchy of response with maxillofacial prosthesis in terms of their psychological, family and social functioning.[1,7-9]

Maxillofacial Prosthesis Performance Scale (MFPPS) comprised of 10 questions which included functional discomfort, retention, stability, phonetics, aesthetics, oral hygiene, saliva, taste ability, psychology and satisfaction. A five point Likert scale was used and the highest score (i.e. 5) indicates best response to the function with obturator prostheses and lowest score (i.e. 1) denotes function of the obturator prostheses with greater difficulties.[1]

2.1. Statistical analysis

To compare the relative effect on quality of life in different aspects, weighted mean scores were noted. The collected data was analyzed with IBM.SPSS statistics software 23.0 Version (USA). To find the significant difference between the bivariate samples in paired groups, the Paired sample t-test and the Wilcoxon signed rank test were used and for independent groups the unpaired sample t-test was used. In all the above statistical tools the P value > 0.05 was considered as significant level.[1,5]

3. Results

3.1. UW-QoL

Table 1 depicts subjective assessment with UW-Qol. Patient's perception of improvement in appearance was significant. The values increased from paired mean of 11.8to56.3 with mean difference of 44.47 post prosthodontic rehabilitation. The chewing and swallowing also have shown marked change with mean difference of45.78 and 56.73 respectively when compared to pre-prosthetic rehabilitation. There was decrease in anxiety levels of patients (mean difference 59.47) and improvement in the psychological well-being with more involvement socially. This was evident by an increase in paired mean from 1.31 to 60.78 post prosthodontic rehabilitation. The OHRQoL quality of life

index after obturator prosthesis insertion increased from overall mean of 15.72 pre insertion to 62.08 post insertion of the obturator depicting statistically significant results in all parameters. (**Table 1**)

3.2. OFS

The mean OFS scores of 38 patients rehabilitated with maxillary obturator were 61.54 and 70.07 after 7 days and 30 days of prosthesis function, respectively.(**Table 2**)

There was significant improvement in speaking with prosthesis inserted from 7 days of (mean value 56.84) prosthesis insertion to 30 days (mean value 75.7), though the change in nasality of voice remained insignificant from 7 days (mean value 75.7) to 30 days (mean value 76.8) of prosthesis insertion.

The problems of leakage while swallowing also remained insignificant from day 7 to day 30 of prosthodontic rehabilitation though some leakage persisted while swallowing with prosthesis.

The results seem to be consistent with the fact that hypernasality of voice and leakage of food while swallowing are the primary concerns of patient post maxillectomy and these need to be addressed at the time of insertion of prosthesis only. The chewing efficiency with the prosthesis showed marked improvement from day 7 (mean value 47.3) to day 30(mean value 64.2) post insertion. This result shows that chewing and speech activities take a minimum of 30 days to adapt to new prosthesis. Difficulty in the insertion and removal of prosthesis also eased out within 30 days of prosthesis use.

After 7 days and 30 days post prosthodontic rehabilitation, highly significant difference (*P* value = .0005) was observed in almost all parameters of OFS except the hypernasality of speech, leakage of foods and esthetic concerns with the prosthesis, although there was marked improvement in appearance of patient from the day of prosthesis insertion itself as depicted in **Table 2**.

3.3. MFPPS

The scale showed significant results when the performance of prosthesis was assessed in terms of parameters of improved chewing (z=3.46), less leakage of fluids (z=2.12) and better speech (z=3.44) compared on day 7 and day 30 as depicted by **Table 3**.

The rest all parameters of prosthesis fit, altered taste and problem with maintenance of prosthesis after insertion and appearance change remained insignificant. The most probable reason for its insignificance can be seen in the fact that all these parameters are being taken care on the first day of prosthesis insertion.

Table 1: Subjective Assessment with UW-Qol

S.No.	UW-QoLQuestion criteria	Pre Surgery score UW-QoL (Mean± SD)	Post-Surgery score UW-QoL (Mean±SD)	p Value
1.	Pain	7.89±11.93	65.79±18.35	.000001
2.	Appearance	11.84±21.02	56.32±23.14	.000002
3.	Activity	7.89±11.93	55.26±19.68	.00001
4.	Recreation	3.94±9.36	56.57±20.14	.000023
5.	Swallowing	19.47±39.22	65.26±22.45	.000003
6.	Chewing	2.63±7.88	60.26±20.78	.000001
7.	Speech	11.84±20.35	68.94±10.87	.000002
8.	Shoulder	48.94±25.58	70.52±8.48	.000001
9.	Taste	10.26±20.03	55.52±20.67	.000001
10.	Saliva	60±18.48	70.52±1.57	.021
11.	Mood	2.63±7.88	59.21±17.09	.00001
12.	Anxiety	1.31±5.73	60.78±17.01	.00002

Table 2: Subjective assessment with OFS

S.No.	OFS criteria	OFS Day7 (Mean±SD)	OFS Day30 (Mean±SD)	p Value
1.	Chewing	52.63±16.61	73.68±13.42	.000
2.	Leakage while Swallowing	56.84±10.02	75.78±8.37	.000
3.	Voice Difference	75.78±14.26	76.84±13.76	.331
4.	Speaking in Public	78.94±14.10	80.00±13.33	.331
5.	Nasal Speech	77.89±16.18	78.94±15.60	.331
6.	Word Pronunciations	58.95±26.22	61.05±26.22	.163
7.	Understanding of Speech	65.26±25.68	66.31±24.99	.331
8.	Speaking on Phone	53.68±9.55	71.57±12.14	.000

9.	Dry Mouth	54.73±9.04	74.73±9.04	0.0
10.	Aesthetics	54.73±9.04	75.78±8.37	.000
11.	Clasps visibility	62.10±11.34	70.52±10.25	.002
12.	Numbness of upper lip	47.36±16.61	64.21±23.64	.000
13.	Avoids Family events	63.15±30.74	63.15±30.74	0.0
14.	Difficulty in denture insertion	83.15±33.50	83.15±33.50	0.0
15.	Upper lip looks funny	37.89±16.18	65.26±19.82	.000

Table 3: Subjective Assessment with MFPPS

Criteria	Functional Discomfort	Retention	Stability	Phonetics	Esthetics	Oral Hygiene	Saliva	Taste	Psychology	Satisfaction
	MFPPS1 DAY30 - MFPPS1 DAY7	MFPPS2 DAY30 - MFPPS2 DAY7	MFPPS 3 DAY30 - MFPPS 3 DAY7	MFPPS4 DAY30 - MFPPS4 DAY7	MFPPS 5 DAY30 - MFPPS 5 DAY7	MFPPS 6 DAY30 - MFPPS 6 DAY7	MFPPS 7 DAY30 - MFPPS 7 DAY7	MFPPS 8 DAY30 - MFPPS 8 DAY7	MFPPS9 DAY30 - MFPPS9 DAY7	MFPPS 10 DAY30 - MDPPS10 DAY7
Z	-3.464[b]	-2.121[b]	-1.857[b]	-3.448[b]	-1.000[b]	.000[c]	-1.342[b]	-1.732[b]	-1.000[b]	.000[c]
Asymp. Sig. (2-tailed)	.001	.034	.063	.001	.317	1.000	.180	.083	.317	1.000

4. Discussion

The important studies which investigated the functioning of obturators in patients with maxillary defects using Obturator Functioning Scale included studies done by Kalaignanand Ahmed[1] (50 patients in 5yrs), Chen et al.[8] (29 patients in 10yrs), Kornblith et al.[9] (47 patients in 6yrs), Chigurupati et al.[11] (23 patients in 9yrs) and Irish et al.[12] (42 patients).

Chen et al.[8] evaluated OFS in patients with unilateral maxillary defects rehabilitated with obturator with different modes of retention. There was significant improvement in functions of speech, swallowing and chewing with obturator especially when retained with stud attachment and magnetic attachment than conventional obturator.[8] These results are consistent with present study where significant increase in HR-QoL was observed. Seignemartin et al.[2] also concluded that patients rehabilitated with an obturator prosthesis after maxillectomy had good overall QoL andOFS scores as depicted in the present study.[2] These studies suggest that better obturator functioning resulted in better quality of life for the patients in terms of their psychological, family and social functioning and are consistent with the results of the present study.[1,8,9,11,12] UW-QoL as subjective assessment index before and after the prosthetic rehabilitation of maxillofacial defect was also considered in their study by Chigurupati et al.[11] (23 patients in 9 yrs), RiazandWarriach[13] (39 patients), Chen et al.[8] (29 patients in 10 yrs) and Breeze et al.[10] (39 patients in 5 yrs). Breeze et al.[9] used UW-QoLscale in patients who had undergone ablative surgery followed by reconstruction with a flap and compared it with prosthodontic rehabilitation using an obturator. They concluded that obturators remain mainstay treatment post maxillectomy with improved UW-QoL scores as depicted in the present study.[9,10] Chigurupati et al.[11] conducted astudy on patients with maxillary defects followed by prosthetic rehabilitation with obturator which was assessed using 3 questionnaires: UW-QoL, OFS, and Mental Health Inventory (MHI). Individualswho received adjuvant radiations scored low for speech, appearance, saliva and overall QoL. There was a strong correlation between QoL scores in OFS and UW-QoL questionnaires and are consistent with the results in the present study.[11]

The overall mean difference in UW-QoL (46.35) before and after the prosthetic rehabilitation implies better quality of life. These results are consistent with studies performedearlier by Chigurupati et al[11] (23 patients in 9 yrs), Riazand Warriach[13] (39 patients), Chen et al.[8] (29 patients in 10 yrs) and Breeze et al.[10] (39 patients in 5yrs). All these studies came to a common conclusion of improvement in quality of life after the prosthetic rehabilitation and are consistent with the present study with statistically significant results.

MFPPS scale for the assessment of effect on quality of life at 7th and 30th day of prosthesis insertion showed marked improvement in obturator functioning as patients get habituated with its increased usage and this time frame is required to accommodate with new obturator prosthesis. Our results are consistent with studies performed earlier by Kalaignanand Ahmed in 2021.[1] Kalaignanand Ahmedassessed the impact of definitive maxillary obturator prosthesis on HRQol using using three scales OHIP-Edent-19, OFS and MFPPS. The assessment was done after 2 weeks and 3 months of prosthesis function on 50 patients with maxillectomy defects. The results show significant improvements with prosthesis in terms of functional, physical, psychological and social parameters after long-term follow-up (3 months).[1] Similar results are depicted in the present study.

The minimum possible time required for a patient to get habituated to prosthesis is about 1 month after the prosthetic rehabilitation as developmentof new memory patterns often takes time of about 3-4 weeks for both the masticatory muscles and the facial muscles. Once the pattern become automatic, chewing process will take place without conscious effort.[1] The results were statistically significant when assessed at 1 month of prosthetic rehabilitation both with OFS (mean difference10.52) and MFPPS especially in aspects of chewing, speaking and swallowing. Thus, the findings of improvement in quality of life after prosthodontic rehabilitation is validated with more firmity as all the scales used for assessment depicted the same results.

Our study provided an initial idea of the evaluation of the quality of life of patients after maxillofacial prosthetic rehabilitation. This is to focus attention on the contribution of maxillofacial prosthetics to the well- being of patients. The strength of the study lies in being a multi centric study. The sample selected was heterogeneous on the grounds of age, gender or span of the defect which can be categorized as limitations of the study. Long-term assessment and follow-up of the same is required to probe any changes due to demographic variability.

5. Conclusion

Obturator prosthesis is a highly effective and non-invasive approach to improve the quality of life of patients with maxillectomy defects as it creates a physical barrier between oral cavity and nasal cavity, thus, decreasing the disabilities encountered by the patients. The findings in the present study depictsignificant improvements in QoLwith prosthesis in terms of functional, physical, psychological and social parameters.

Future research on designing customized prosthesis and patient specific implants will help to overcome the problems typically associated with obturator prostheses and will improve patient's quality of life post maxillectomy.

This study can be further followed by increasing the number of sample sizes and its duration.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Kalaignan SP, Ahmed SE. Oral health-related quality of life (OHRQoL) in patients with definitive maxillary obturator prostheses: A prospective study. *J Adv Oral Res*. 2021;12(1):66-74.
2. Seignemartin CP, Miranda ME, Luz JG, Teixeira RG. Understandability of speech predicts quality of life among maxillectomy patients restored with obturator prosthesis. *J Oral Maxillofac Surg*. 2015;73(10):2040-8.
3. Gastaldi G, Palumbo L, Moreschi C, Gherlone EF, Capparé P. Prosthetic management of patients with oro-maxillo-facial defects: A long-term follow-up retrospective study. *Oral Implantology*. 2017;10(3):276–82.
4. What quality of life? The WHOQOL Group. World Health Organization Quality of Life Assessment. *World Health Forum*. 1996;17(4):354–6.
5. Kumar P, Alvi HA, Rao J, Singh BP, Jurel SK, Kumar L, et al. Assessment of the quality of life in maxillectomy patients: A longitudinal study. *J Adv Prosthod*. 2013;5(1):29–35.
6. Lowe D, Rogers SN. University of Washington Quality of Life Questionnaire Guidance for Scoring and Presentation. 2018. http://www.hancsupport.com/sites/default/files/assets/pages/UW-QOL-update-2018.pdf
7. Khan MW, Shah AA, Fatima AL, Hanif A. Subjective assessment of obturator functioning in patients with hemimaxillectomy. *Pak J Med Health Sci*. 2014;8(3):694–7.
8. Chen C, Ren WH, Huang RZ, Gao L, Hu ZP, Zhang LM, et al. Quality of life in patients after maxillectomy and placement of prosthetic obturator. *Int J Prosthodont*. 2016;29(4):363–8.
9. Kornblith AB, Zlotolow IM, Gooen J, Huryn JM, Lerner T, Strong EW, Shah JP, Spiro RH, Holland JC. Quality of life of maxillectomy patients using an obturator prosthesis. *Head Neck*. 1996;18(4):323–34.
10. Breeze J, Rennie A, Morrison A, Dawson D, Tipper J, Rehman K, et al. Health-related quality of life after maxillectomy: obturator rehabilitation compared with flap reconstruction. *Br J Oral Maxillofac Surg*. 2016;54(8):857–62.
11. Chigurupati R, Aloor N, Salas R, Schmidt BL. Quality of life after maxillectomy and prosthetic obturator rehabilitation. *J Oral Maxillofac Surg*. 2013;71(8):1471–8.
12. Irish J, Sandhu N, Simpson C, Wood R, Gilbert R, Gullane P, et al. Quality of life in patients with maxillectomy prostheses. *Head Neck*. 2009;31(6):813–21.
13. Riaz N, Warriach RA. Quality of life in patients with obturator prostheses. Journal of Ayub Medical College Abbottabad. 2010;22(2):121-5.
14. Kreeft AM, Krap M, Wismeijer D, Speksnijder CM, Smeele LE, Bosch SD, et al. Oral function after maxillectomy and reconstruction with an obturator. *Int J Oral Maxillofac Surg*. 2012;41(11):1387–92.
15. Hertrampf K, Wenz HJ, Lehmann KM, Lorenz W, Koller M. Quality of life of patients with maxillofacial defects after treatment for malignancy. *Int J Prosthodon*. 2004;17(6):657–65.

Cite this article: Mittal D, Dua P, Nagarajan T, Kumar S, Singh N, Yangchen S. Assessment of quality of life in maxillectomy patients rehabilitated with obturator prosthesis. *IP Ann Prosthodont Restor Dent*. 2025;11(2):145-149.