

Original Research Article
Prosthodontics

Assessment of Quality of Life in Maxillectomy Patients Following Prosthodontic Rehabilitation: A Questionnaire-Based Study Across Aramany Classes

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Abstract

Background: Maxillectomy causes significant functional and esthetic impairments, affecting mastication, speech, and psychological well-being. Prosthodontic rehabilitation improves oral health–related quality of life (QoL), but the influence of defect extent (Aramany classification) remains underexplored. **Objective:** To assess QoL outcomes in maxillectomy patients rehabilitated with obturator prostheses and compare variations across Aramany defect classes. **Materials and Methods:** A questionnaire-based cross-sectional study was conducted among 50 maxillectomy patients who underwent prosthodontic rehabilitation. QoL was evaluated using the Oral Health Impact Profile-14 (OHIP-14) and the Obturator Functioning Scale (OFS). Responses were recorded on Likert scales. Data were analyzed using SPSS v21.0 with Wilcoxon signed-rank and chi-square tests at a 5% significance level. **Results:** Males (58%) outnumbered females (42%). Most patients had Type I defects (52%), followed by Type II/III (14% each), Type IV (12%), and Type VI (8%). Mucormycosis was the leading cause (78%), followed by trauma (12%) and cancer (10%). Prosthodontic rehabilitation significantly improved QoL ($p = 0.001$). Patients with extensive anterior/posterior defects (Aramany I & II) showed lower functional and psychological domain scores than those with smaller lateral defects (Classes IV–VI). Post-oncologic patients experienced greater psychological distress compared to trauma cases. **Conclusion:** Prosthodontic rehabilitation enhances QoL in maxillectomy patients, though outcomes vary based on Aramany defect classification and etiology. Personalized rehabilitation strategies considering defect size and etiology are essential.

Keywords: Maxillectomy, Aramany classification, Quality of life, Prosthodontic rehabilitation, Obturator prosthesis, OHIP-14.

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INTRODUCTION

Maxillectomy—the surgical removal of part or all of the maxilla—is indicated for malignant tumors, severe trauma, and opportunistic infections such as mucormycosis [2] and can be life-saving. However, the procedure leads to extensive oro-nasal defects that compromise mastication, deglutition, speech, and facial esthetics [1, 2]. Such functional impairments often

precipitate social withdrawal, depression, and reduced quality of life (QoL).

Prosthodontic rehabilitation using obturator prostheses can significantly restore oral function and appearance, although the extent of improvement depends on factors such as defect location, size, and remaining dentition [3]. Aramany's classification categorizes

maxillectomy defects into six classes based on residual structures and support: Classes I and II represent extensive resections with limited retention sites, whereas Classes IV–VI are more localized and generally easier to rehabilitate [4].

Although previous studies have confirmed QoL benefits following prosthetic rehabilitation, few have analyzed outcomes across different Aramany classes. Recognizing how defect classification affects QoL is essential for designing tailored obturators and improving pre-treatment counseling [4].

This study aims to evaluate QoL after prosthodontic rehabilitation in maxillectomy patients and compare outcomes across Aramany classifications using validated instrument.

MATERIALS AND METHODS

A cross-sectional questionnaire-based study was conducted at Government Dental College and Hospital, Ahmedabad, Gujarat, India between January 2024 to December 2024. Informed consent was obtained from all participants.

Inclusion criteria included patients ≥ 18 years, at least 6 months post-maxillectomy, completed prosthodontic rehabilitation, and able to respond to questionnaires.

Exclusion criteria were recurrent disease, cognitive impairments, or refusal to participate.

QoL was assessed using the Oral Health Impact Profile-14 (OHIP-14) and the Obturator Functioning Scale (OFS). Demographics, prosthesis type, duration since rehabilitation, and satisfaction levels were also recorded.

Data were analyzed using SPSS v21.0. Descriptive statistics summarized demographics. Wilcoxon signed-rank test compared pre- vs post-rehabilitation scores. Chi-square tests assessed associations between categorical variables (Aramany

class, etiology, prosthesis type) and QoL outcomes, with significance at $p < 0.05$.

RESULTS

A total of 50 maxillectomy patients were included: 29 males (58%) and 21 females (42%). Most patients had Type I defects (52%), followed by Type II & III (14% each), Type IV (12%), and Type VI (8%). Mucormycosis was the leading cause (78%), followed by trauma (12%) and cancer (10%).

Prosthodontic rehabilitation significantly improved QoL scores ($p = 0.001$). Patients with larger anterior/posterior defects (Aramany I & II) showed lower functional and psychological domain scores than those with smaller lateral defects (Classes IV–VI). Post-oncologic patients reported greater psychological distress compared to trauma-related cases.

Most patients found chewing somewhat easy (48%) or very easy (20%), and 48% reported significant improvement in speech. Confidence in appearance improved, with 34% extremely confident and 34% quite confident. Satisfaction levels were high: 42% somewhat satisfied, 38% very satisfied.

Table 1: Gender Distribution of based on the number Maxillectomy Patients Following Prosthodontic Rehabilitation

Gender	N (%)	P value
Male	29(58)	0.05**
Female	21(42)	
Total	50(100)	

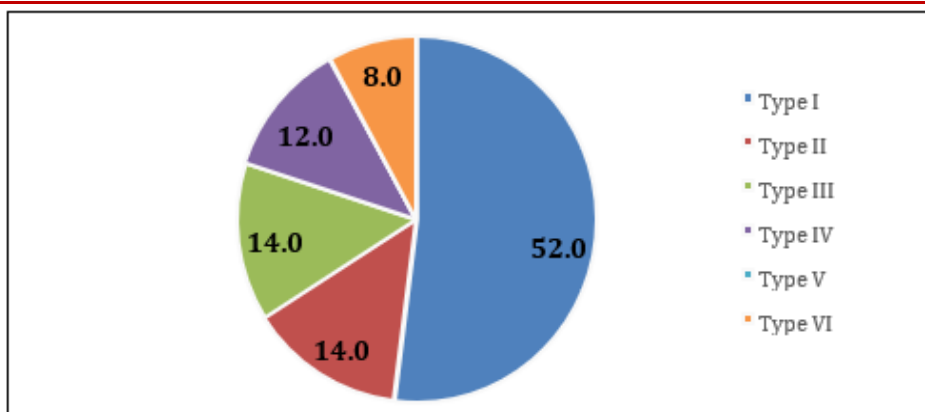
0.05*-Statistically significant, 0.05**-Statistically non-significant

Table 1: Shows the Distribution of gender based on the number Maxillectomy Patients Following Prosthodontic Rehabilitation. Out of the total 50 participants, majority were male 29(58) than female participants 21(42). A statistically non-significant association was observed in the gender distribution of maxillectomy patients undergoing prosthodontic rehabilitation ($p = 0.05$).

Table 2: Distribution of Maxillectomy Patients Across Aramany Classes Following Prosthodontic Rehabilitation

Aramany Classification	N (%)	P value
Type I	26(52)	0.05*
Type II	7(14)	
Type III	7(14)	
Type IV	6(12)	
Type V	0(0)	
Type VI	4(8)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 1: Distribution of Maxillectomy Patients Across Aramany Classes Following Prosthodontic Rehabilitation

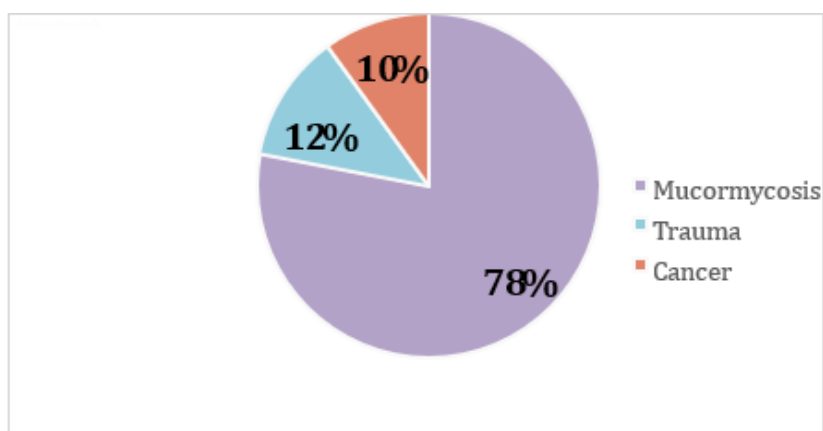
Table 2 and Graph 1: Shows the distribution of participants based on the Aramany Classification of Maxillectomy Defect is shown. Out of the total 50 participants, the majority had Type I defects (52%), followed by Type II and Type III (14% each), Type IV

(12%), and Type VI (8%). A statistically significant association ($p = 0.05$) was observed between Aramany classification and the quality of life outcomes, indicating that the type of defect may influence rehabilitation results.

Table 3: Etiological Distribution of Maxillectomy Patients Undergoing Prosthodontic Rehabilitation

Etiology	N (%)	P value
Mucormycosis	39(78)	0.05*
Trauma	6(12)	
Cancer	5(10)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 2: Etiological Distribution of Maxillectomy Patients Undergoing Prosthodontic Rehabilitation

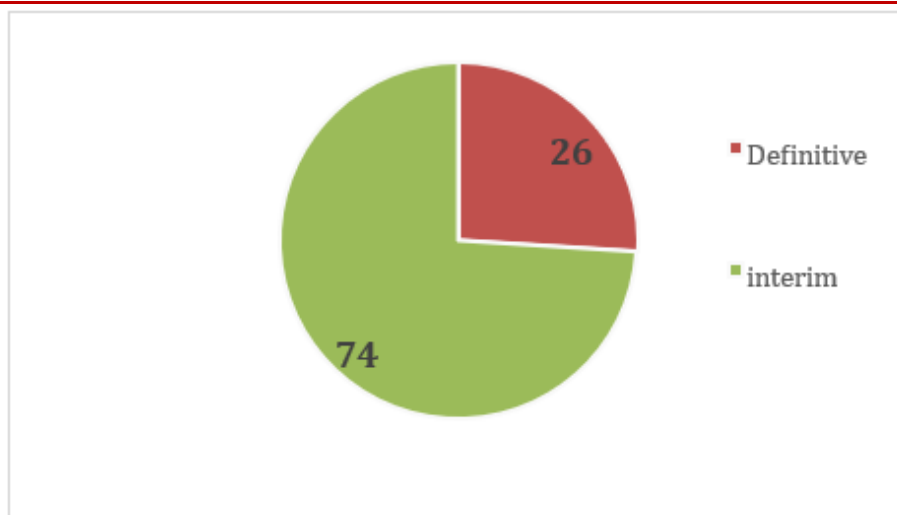
Table 3: Shows the distribution of participants based on the etiology. Out of the total 50 participants, the majority had Mucormycosis (78%), followed by Trauma (12%)

and Cancer (10%). A statistically significant association was observed between etiology and the impact of prosthodontic rehabilitation on quality of life ($p = 0.05$).

Table 4: Distribution of Type of Prosthesis Provided to Maxillectomy Patients

Type of Prosthesis	N (%)	P value
Definitive	13(26)	0.05*
Interim	37(74)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 3: Distribution of Type of Prosthesis Provided to Maxillectomy Patients

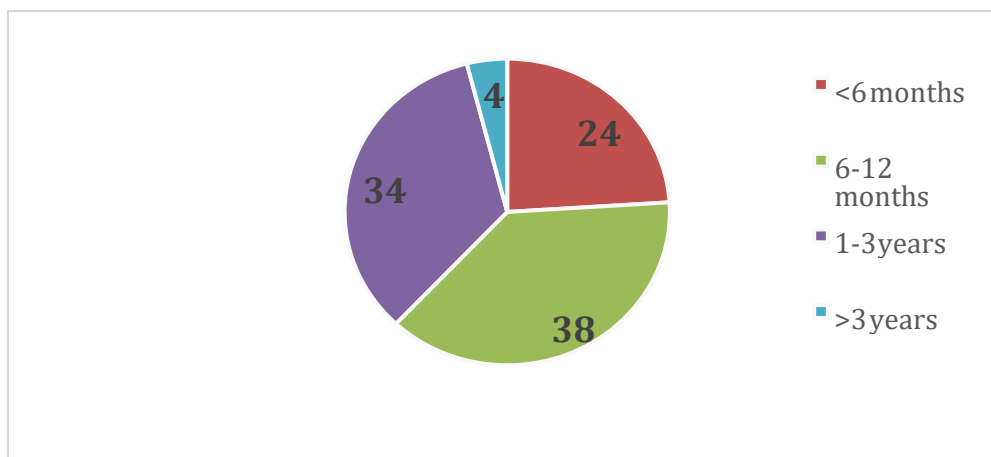
Table 4 shows the distribution of participants based on the type of prosthesis received. Out of the 50 participants, the majority received interim prosthesis 37(74%), while only 13(26%) received a definitive

prosthesis. A statistically significant association ($p = 0.05$) was noted between the type of prosthesis and the perceived quality of life post-rehabilitation.

Table 5: Distribution of participants based on the Duration Since Prosthodontic Rehabilitation Among Maxillectomy Patients

Duration Since Rehabilitation	N (%)	P value
<6 months	12(24)	0.05*
6-12 months	19(38)	
1-3 years	17(34)	
>3 years	2(4)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 4: Distribution of participants based on the Duration Since Prosthodontic Rehabilitation Among Maxillectomy Patients

Table 5 presents the distribution of participants based on the duration since rehabilitation. Among the 50 participants, the highest proportion had undergone rehabilitation 6-12 months prior (38%), followed by 1-3

years (34%), less than 6 months (24%), and more than 3 years (4%). A statistically significant association was observed between the duration since rehabilitation and participants' quality of life outcomes ($p = 0.05$).

Table 6: Distribution of Participants' Comfort While Chewing a Variety of Foods Post Rehabilitation

Patients' comfort	N (%)	P value
Very uncomfortable	6(12)	0.05*
Somewhat difficult	5(10)	
Neutral	5(10)	
Somewhat easy	24(48)	
Very easy	10(20)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant

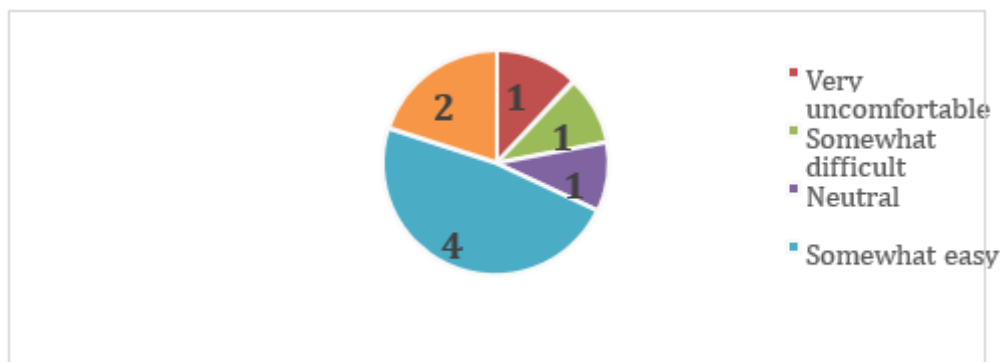
**Graph 5: Distribution of Participants' Comfort While Chewing a Variety of Foods Post Rehabilitation**

Table 6 illustrates the comfort levels of participants while chewing various foods using their prosthesis. Nearly half of the participants found it somewhat easy (48%), followed by those who found it, very easy (20%), somewhat difficult (10%), neutral

(10%), and very uncomfortable (12%). A statistically significant association ($p = 0.05$) was observed between chewing comfort and prosthodontic rehabilitation outcomes.

Table 7: Distribution of participants Self-Reported Improvement in Speech Post-Rehabilitation

Patients' comfort	N (%)	P value
No improvement at all	2(4)	0.05*
Slight improvement	10(20)	
Moderate improvement	3(6)	
Significant improvement	24(48)	
Excellent improvement	11(22)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant

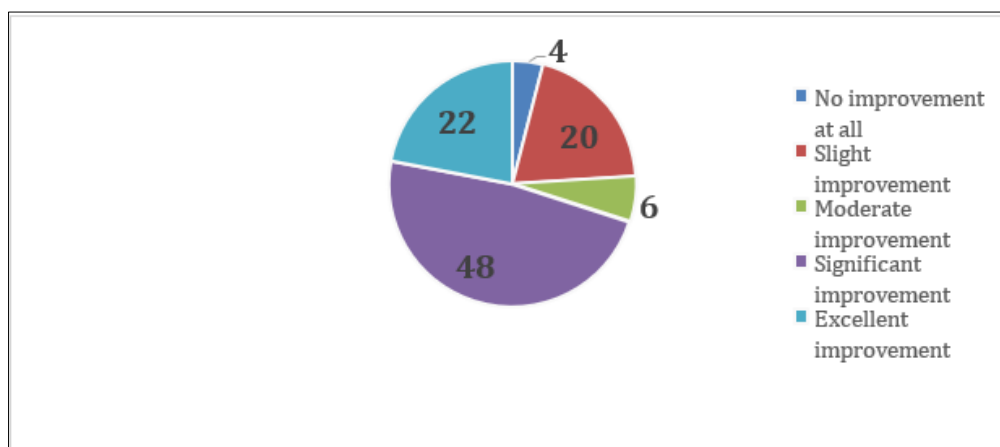
**Graph 6: Distribution of participants Self-Reported Improvement in Speech Post-Rehabilitation**

Table 7 displays the perceived improvement in speech after using the prosthesis. A majority of

participants reported significant improvement (48%), followed by excellent improvement (22%), slight

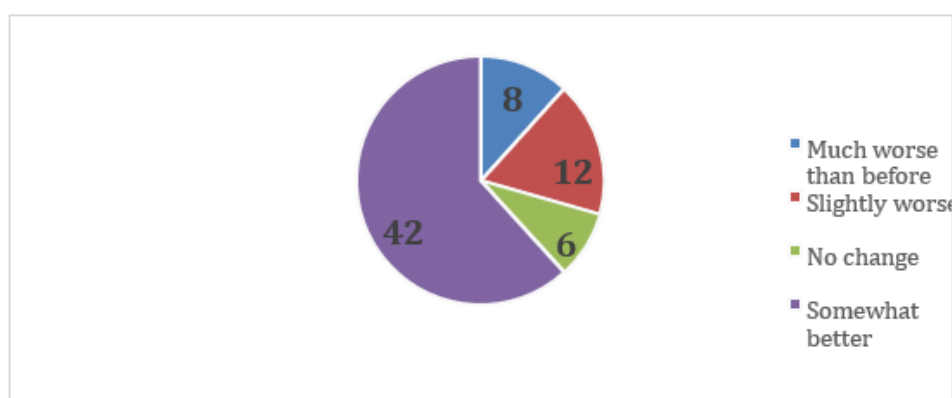
improvement (20%), moderate improvement (6%), and no improvement (4%). A statistically significant

association was observed, suggesting prosthetic rehabilitation positively influenced speech clarity.

Table 8: Distribution of participants' self-rating of functional abilities (Eating, Speaking, Daily Activities) After Rehabilitation

Patients' comfort	N (%)	P value
Much worse than before	4(8)	0.05*
Slightly worse	6(12)	
No change	3(6)	
Somewhat better	21(42)	
Much better than before	16(32)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 7: Distribution of participants' self-rating of functional abilities (Eating, Speaking, Daily Activities) After Rehabilitation

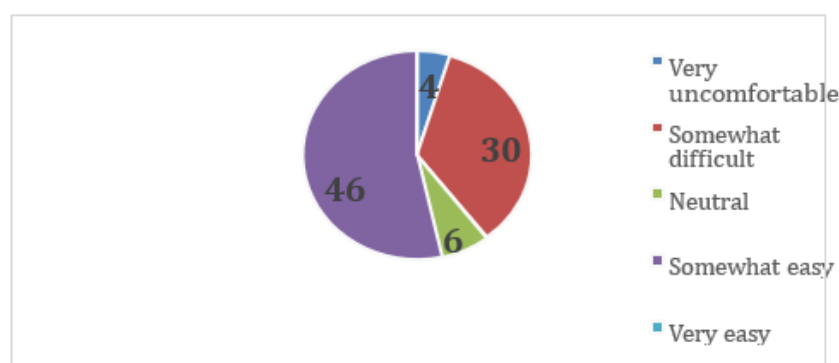
Table 8 highlights the ease with which participants could insert and remove their prosthesis. Most participants found it somewhat better (42%) or much better than before (32%), while others found it

slightly worse (12%), very difficult (8%), or experienced no change (6%). A statistically significant association ($p = 0.05$) was observed between rehabilitation and perceived improvement in daily function.

Table 9: Distribution of participants' ease of inserting and removing the prosthesis

Patients' comfort	N (%)	P value
Very uncomfortable	2(4)	0.05*
Somewhat difficult	15(30)	
Neutral	3(6)	
Somewhat easy	23(46)	
Very easy	7(14)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 8: Distribution of participants' ease of inserting and removing the prosthesis

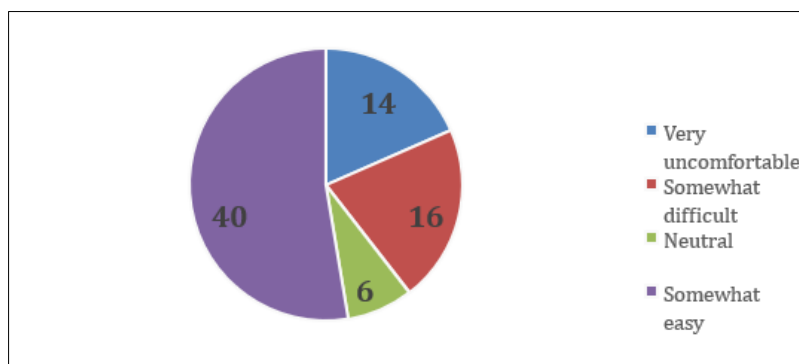
Table 9 represents participants' ease of inserting and removing the prosthesis. A majority felt it was somewhat easy (46%) or very easy (14%). Others reported it somewhat difficult (30%), very

uncomfortable (4%), or neutral (6%). A statistically significant association was observed in participants' ease of inserting and removing the prosthesis.

Table 10: Distribution of participants' daily comfort with prosthesis use

Patients' comfort	N (%)	P value
Very uncomfortable	7(14)	0.05*
Somewhat difficult	8(16)	
Neutral	3(6)	
Somewhat easy	20(40)	
Very easy	12(24)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 9: Distribution of participants' daily comfort with prosthesis use

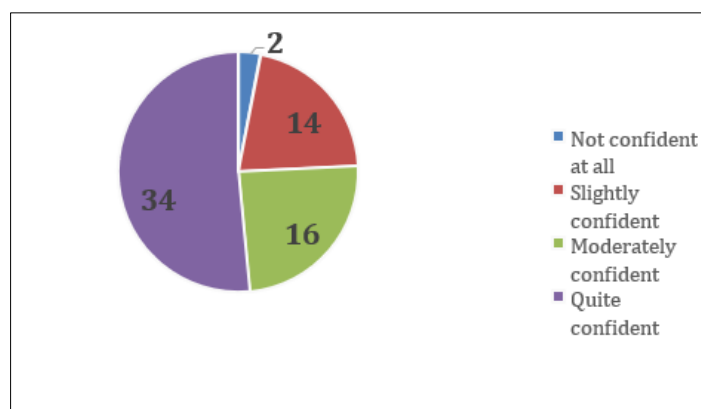
Table 10 represents how comfortable participants felt using the prosthesis daily. A majority felt it was somewhat easy (40%) or very easy (24%). Others reported it somewhat difficult (16%), very

uncomfortable (14%), or neutral (6%). A statistically significant association was observed, highlighting user adaptability to prostheses.

Table 11: Distribution of participants' confidence in appearance post-rehabilitation

Patients' comfort	N (%)	P value
Not confident at all	1(2)	0.05*
Slightly confident	7(14)	
Moderately confident	8(16)	
Quite confident	17(34)	
Extremely confident	17(34)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 10: Distribution of participants' confidence in appearance post-rehabilitation

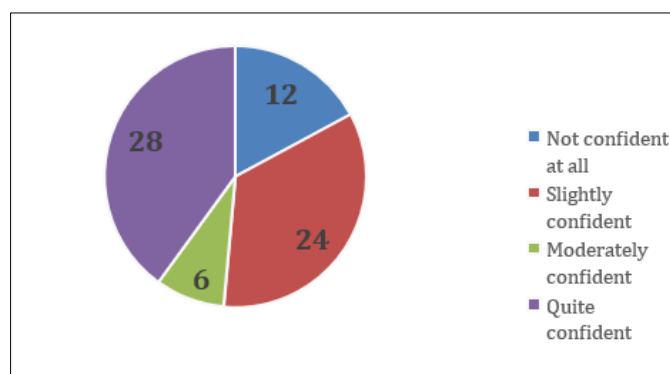
Table 11 details participants' confidence in their appearance post-rehabilitation. Most participants felt extremely confident (34%) or quite confident (34%), while others reported being moderately confident (16%),

slightly confident (14%), or not confident at all (2%). A statistically significant association was observed, showing overall positive acceptance of the prosthesis.

Table 12: Distribution of participants' confidence in social participation after receiving prosthesis

Patients' comfort	N (%)	P value
Not confident at all	6(12)	0.05*
Slightly confident	12(24)	
Moderately confident	3(6)	
Quite confident	14(28)	
Extremely confident	15(30)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 11: Distribution of participants' confidence in social participation after receiving prosthesis

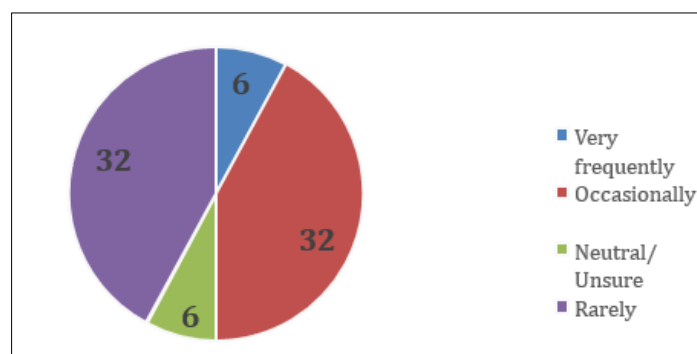
Table 12 displays the levels of confidence in social participation post-rehabilitation. Many participants felt extremely confident (30%) or quite confident (28%), followed by slightly confident (24%),

not confident at all (12%), and moderately confident (6%). A statistically significant association was observed, indicating improved self-perception.

Table 13: Distribution of participants' incidence of food or liquid leakage into the nasal cavity while eating or drinking

Patients' comfort	N (%)	P value
Very frequently	3(6)	0.05*
Occasionally	16(32)	
Neutral/ Unsure	3(6)	
Rarely	16(32)	
Never	12(24)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 12: Distribution of participants' incidence of food or liquid leakage into the nasal cavity while eating or drinking

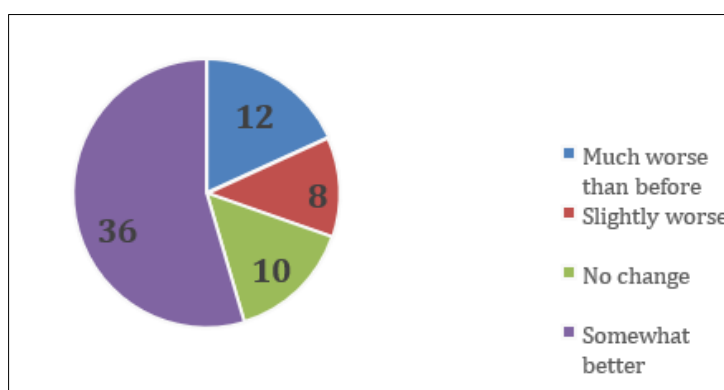
Table 13 shows how often participants experienced food or liquid leakage. An equal number of participants reported the issue occasionally (32%) or rarely (32%), followed by never (24%), very frequently

(6%), and neutral/unsure (6%). A statistically significant association ($p = 0.05$) was observed, indicating prosthesis positively influenced social interactions.

Table 14: Distribution of participants' Quality of Life Before and After Prosthodontic Rehabilitation

Patients' comfort	N (%)	P value
Much worse than before	6(12)	0.05*
Slightly worse	9(18)	
No change	5(10)	
Somewhat better	18(36)	
Much better than before	12(24)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 13: Distribution of participants' Quality of Life Before and After Prosthodontic Rehabilitation

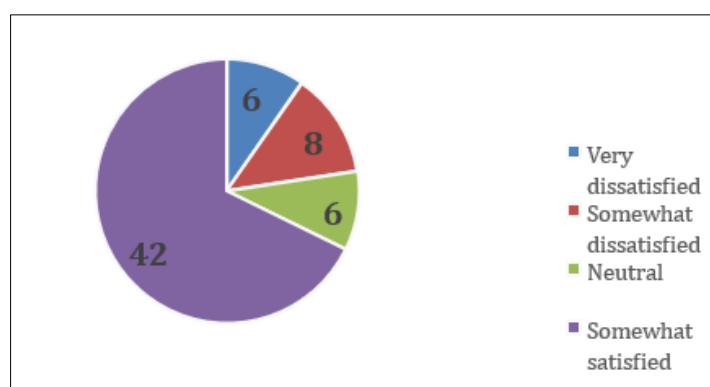
Table 14 outlines participants' perceptions of their quality of life post-rehabilitation. Most felt somewhat better (36%) or much better than before (24%), while others experienced slightly worse (18%),

much worse (12%), or no change (10%). A statistically significant association was observed, showing that leakage still occurred in a notable subset post-rehabilitation.

Table 15: Distribution of participants' satisfaction with prosthodontic rehabilitation

Patients' comfort	N (%)	P value
Very dissatisfied	3(6)	0.05**
Somewhat dissatisfied	4(8)	
Neutral	3(6)	
Somewhat satisfied	21(42)	
Very satisfied	19(38)	
Total	50(100)	

0.05*-Statistically significant, 0.05**-Statistically non-significant



Graph 14: Distribution of participants' satisfaction with prosthodontic rehabilitation

Table 15 reflects participants' satisfaction with their rehabilitation. The majority were somewhat satisfied (42%) or very satisfied (38%), with a few expressing dissatisfactions: somewhat dissatisfied (8%), very dissatisfied (6%), or neutral (6%). A statistically non-significant association was observed, suggesting mixed satisfaction levels among patients.

DISCUSSION

1. Overall Quality of Life After Rehabilitation

This study demonstrated a significant improvement in the quality of life (QoL) of maxillectomy patients following prosthodontic rehabilitation. Most participants reported better mastication, speech, and social confidence after receiving obturators. These findings are consistent with Depprich and colleagues, who highlighted that obturator prostheses significantly enhance oral function, appearance, and psychosocial well-being in patients with maxillary defects [3]. Similarly, Ali *et al.*, confirmed that prosthetic rehabilitation reduces social withdrawal, improves self-image, and positively impacts mental health [1].

Furthermore, Deguchi *et al.* emphasized that sociodemographic factors, defect size, and prosthesis retention strongly influence patient-perceived QoL outcomes [5]. Our study corroborates these observations, as smaller defects and better retention (seen in lower Aramany classes) were linked with better functional and psychosocial outcomes.

2. Influence of Defect Size and Aramany Classification

Our findings indicate that patients with extensive defects (Aramany Class I & II) reported relatively lower QoL improvements compared to those with localized defects (Classes IV–VI).

This is in agreement with Ali *et al.*, [1] and Dos Santos *et al.*, [4] who stated that residual anatomical support directly affects retention, stability, and consequently patient satisfaction. The absence of sufficient retention areas in large defects limits the functional success of conventional obturators.

Conversely, Rogers *et al.*, reported no significant difference in QoL across different defect sizes after rehabilitation, suggesting that patients adapt functionally and psychosocially over time regardless of defect class.[6] This conflicting evidence highlights the need for individualized treatment approaches.

3. Role of Radiation and Adjuvant Therapies

Radiation therapy is known to negatively affect oral tissues, saliva production, and mucosal health. In our study, irradiated patients reported slightly lower comfort in mastication and speech, consistent with Rogers *et al.*, who observed diminished oral function and aesthetics after radiotherapy in maxillectomy cases [6] Similarly,

Ali *et al.*, [1] found that radiation-treated patients often experienced poorer obturator retention due to tissue changes and xerostomia.

However, a multicenter study published in the *British Journal of Oral and Maxillofacial Surgery* contradicted this, showing no statistically significant impact of radiotherapy on long-term QoL, suggesting that patient adaptation and prosthetic optimization may mitigate these effects.

4. Conventional vs Implant-Supported Obturators

Retention emerged as a key factor influencing satisfaction in our cohort. Studies by Buurman *et al.*, demonstrate that implant-supported obturators significantly improve chewing efficiency, retention, and patient comfort compared to conventional prostheses [7]. While our study primarily evaluated conventional obturators, the relatively higher dissatisfaction among extensive defects suggests that implant-retained options may yield better outcomes, especially for Aramany Class I & II defects.

5. Psychosocial and Social Integration

Our results showed notable improvements in social confidence and self-perception post rehabilitation, with most participants feeling “quite confident” or “extremely confident” in social interactions. This aligns with findings by Kornblith *et al.*, who highlighted that psychological distress, anxiety, and depression decrease significantly after prosthetic rehabilitation [8]. Likewise, Ali *et al.*, [2] reported that social reintegration improves with better prosthetic fit and aesthetics.

6. Contradictory Findings in Literature

While most studies agree that obturators enhance QoL, there are variations regarding the extent of improvement and influencing factors:

- Acharya *et al.*, found no significant QoL difference between conventional and soft-liner obturators, suggesting that material choice may have minimal effect on perceived outcomes.[9]
- Rogers *et al.*, [6] also argued that neither defect size nor radiation significantly affected long term QoL, contradicting our findings that Aramany class impacts patient comfort.

These inconsistencies may stem from differences in study design, timing of QoL assessment, and patient adaptation periods. Our study reaffirms that prosthodontic rehabilitation significantly improves functional ability, aesthetics, and psychosocial well-being in maxillectomy patients. However, outcomes vary depending on defect size, retention, and adjuvant therapies. Implant-retained obturators should be considered for extensive defects to optimize retention and function. Future multicenter longitudinal studies are warranted to resolve conflicting evidence regarding the influence of defect class and radiotherapy on QoL.

CONCLUSION

This study highlights that prosthodontic rehabilitation with obturator prostheses significantly improves the quality of life of maxillectomy patients by enhancing mastication, speech, aesthetics, and social confidence. The extent of improvement was influenced by defect size, Aramany classification, and prosthesis retention, with patients having smaller, more localized defects showing better outcomes. While most participants adapted well to interim and definitive prostheses, challenges such as nasal leakage and reduced retention persisted in larger defects. Psychological and social well-being also improved notably after rehabilitation.

These findings emphasize the need for individualized prosthetic designs based on defect classification and suggest that implant-supported obturators may provide superior outcomes for extensive defects. Future multicenter longitudinal studies are warranted to validate these results and explore long-term adaptation and satisfaction.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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