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Frequency of Postinsertion Traumatic Ulcerations and Adjustment Appointments in Complete Denture Patients

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ABSTRACT

Objective: To determine the frequency of post-insertion traumatic ulcerations and adjustment appointments in complete denture patients.

Study Design: Prospective comparative study.

Place and Duration of Study: Combined Military Hospital Multan Institute of Medical Sciences Dental College Multan, Pakistan, from Feb 2024 to Aug 2025.

Methodology: A total of 149 edentulous patients (85 male and 64 female) were provided with new complete maxillary and mandibular dentures. Each patient was recalled for seven follow-up appointments: on Days 1, 2, and 3 post-insertion, and then at 2-day intervals up to Day 11. At each visit, adjustments related to discomfort, pressure areas, ulcerations, and occlusion were recorded for both arches. The association between gender and the need for adjustments at each visit was assessed.

Results: A progressive decline in adjustment needs was observed across visits, with 77.7% of patients requiring adjustments at the first follow-up, 43.9% at the third, and none at the seventh. Mandibular dentures required more frequent adjustments than maxillary dentures throughout the study period. There was no statistically significant difference (p>0.05) between males and females in the frequency of adjustments at any stage of follow-up.

Conclusion: Most post-insertion complaints occurred during the initial visits, particularly in the mandibular arch. Patient adaptation improved significantly by the seventh visit, indicating the importance of regular follow-ups in complete denture treatment.

Keywords: Complete Dentures, Mandibular Discomfort, Post-Insertion Adjustments.

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INTRODUCTION

Complete dentures are still a common prosthetic option for the edentulous, especially in the elderly. Edentulism, the state of having no natural teeth, influences the oral function, aesthetics, and psychosocial status of the individual.[1] In spite of recent advances in prosthodontics, traditional complete dentures are still the preferred treatment for edentulous arch rehabilitation in most regions of the world because they are economical and easily accessible.[2] Yet, when new full dentures are worn, it typically results in a period of adjustment by way of discomfort, most notably as postinsertion traumatic ulcerations.[3] The ulcerations are soft tissue trauma resulting from undue pressure or friction between the denture-bearing surface and the oral mucosa, and they frequently require a series of adjustment visits after denture placement. Prevalence and management of such postinsertion complications are important for successful prosthodontic care and patient satisfaction.[4]

The most common location for traumatic ulcerations was posterior mandibular alveolar ridge (37.7%) and followed by labial sulcus (20.8%) among complete denture patients in Pakistan.[5] Another study showed 80% of patients needed a minimum of one adjustment appointment, and the most frequent site of ulceration was the posterior palatal seal region.[6] It has been observed that almost 92% of patients had at least one mucosal ulceration following denture insertion, which indicates the importance of follow-up visits for correction.[7] A recent survey documented that 78% of denture wearers experienced traumatic ulcers during the first week of denture delivery and needed follow-up adjustment visits, having an average of 2.6 postinsertion visits per patient.[8] Further studies have also supported the prevalence of oral mucosal lesions among complete denture wearers and determined certain high-risk areas for ulcer development.[9,10]

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We conducted this study to determine the frequency of post-insertion traumatic ulcerations and adjustment appointments in complete denture patients.

METHODOLOGY

This study was designed as prospective comparative study and was conducted in Prosthodontics Department, Combined Military Hospital Multan Institute of Medical Sciences Dental College Multan, Pakistan, from February 2024 to August 2025. Ethical approval was obtained from the hospital ethical committee.

Inclusion Criteria: Fully edentulous patients of either gender, who were provided with new maxillary and/or mandibular complete dentures, aged 40 years and above, presenting for their initial postinsertion follow-up appointment within 7 days of receiving their dentures were included.

Exclusion Criteria: Patients having hyper plastic or inflammatory mucosal lesions (fibrous hyperplasia, papillary hyperplasia of the palate, aphthous ulcers, fibrous epulis, fibroepithelial polyp, pyogenic granuloma), having history of auto immune diseases, diabetes and neurological diseases associated with recurrent mucosal ulcers opting for implant-supported overdentures, bony undercuts or irregularities in denture's insertion path, or history of an allergy to acrylic resin were excluded.

Using WHO calculator, based on frequency of postinsertion ulcerations of 80.4%, the minimum sample size required was 143 patients.[6] For possible dropouts or non-responders, the sample size was rounded up to 149 patients. A non-probability consecutive sampling method was used to select participants, and informed consent was obtained from each participant prior to data collection.

All patients who came for a complete denture were enrolled upon meeting the inclusion criteria. All full dentures were constructed with the traditional heat-cured compression molding procedure, following standard clinical procedures such as primary impressions, final impressions with border molding, jaw relation records, trial insertion, and final processing. The same heat-cured acrylic resin and denture construction technique were employed for all subjects to provide standardization and reduce variability in trauma associated with the prosthesis. The dentures were made as a regular clinical procedure in the Department of Prosthodontics, with more than one resident and dental officer working on denture fabrication under close supervision. Collection of data was limited to follow-up after denture insertion, and this was taken care of by a solitary prosthodontist (at least five years of clinical experience in removable prosthodontics) for uniformity. Following denture delivery, all patients were booked for follow-up appointments over a period to observe post insertion tissue response and require denture relines. Recall appointments were booked on the 1st, 2nd, and 3rd days after insertion. Patients were then recalled in two-day intervals until mucosal ulcerations healed and functional comfort with the prosthesis was attained. No patient required more than six post-insertion appointments to achieve prosthesis comfort. Hence, each patient was followed-up for a maximum of 11 days post-insertion, unless earlier clinical comfort was attained.

At each visit, the presence, number, and anatomical location of traumatic ulcerations were measured and noted. Any adjustments to the denture necessary were done at the same visit, and the responsible areas of the denture base or borders were delineated using pressure-indicating paste or pressure spot indicator and corrected accordingly. The affected arch (maxilla, mandible, or both) was also recorded. The number of adjustment appointments needed until symptoms ceased was measured as the main outcome measure. To avoid variation, the same prosthodontist performed all clinical examinations and adjustments.

Data were collected on a standard proforma and subsequently transferred to Statistical Package for Social Sciences (SPSS) version 24 for statistical analysis. Mean and standard deviation (SD) were computed for age. Frequencies and percentages for gender distribution, number of dentures needing adjustments at each appointment, and anatomical sites of traumatic ulcerations in both the arches were computed. Chi-square test was used to determine if gender and the site of the ulcer, and appointment number and frequency of adjustment were associated with each other. Where the anticipated cell frequencies were below 5, then Fisher's exact test was used. A p-value ≤ 0.05 was used to determine statistical significance.

RESULTS

A total of 149 patients participated in the study, each with a maxillary and a mandibular complete denture (149 maxillary and 149 mandibular dentures in total). The mean age of the population was

69.05±9.60 years. Out of the total sample, 85 patients were male (57.05%) and 64 were female (42.95%). Table-I shows the number and percentage of patients needing denture adjustments at every post insertion appointment stage for both maxillary and mandibular dentures. A more frequent rate of adjustments was recorded in mandibular dentures throughout, with 100% of the patients needing adjustments by the first visit and 14.09% continuing to need adjustments up till the seventh appointment. Lingual sulcus was the most common mandibular location affected (82 cases, 60.74%), followed by the retromolar pad (11.85%) and labial frenum (18.52%). There were no reported injuries at the mandibular torus or labial sulcus (Table-II). The posterior palatal seal revealed the highest rate of maxillary injuries (65 cases, 47.41%), followed by the distobuccal sulcus (13.14%) and hamular notch (11.67%). There were no ulcers recorded at the hard palate or mid-palatal suture (Table-III).

Table-I: Frequency of Postinsertion Adjustment Appointments for Maxillary and Mandibular Dentures (n=149)

Adjustment stage	Maxilla n=149 n(%)	Mandible n=149 n(%)	Total n=149 n(%)
Adjustment One	131(87.92%)	149(100.00%)	280(93.96%)
Adjustment Two	90(60.40%)	144(96.64%)	234(78.52%)
Adjustment Three	48(32.21%)	137(91.95%)	185(62.08%)
Adjustment Four	24(16.11%)	99(66.44%)	123(41.28%)
Adjustment Five	8(5.37%)	60(40.26%)	68(22.82%)
Adjustment Six	1(0.67%)	34(22.82%)	34(11.41%)
Adjustment Seven	0(0.00%)	21(14.09%)	21(7.05%)

Table-II: Distribution of Mandibular Denture-Related Traumatic Ulcerations by Anatomical Site and Gender (n=149)

Anatomical Site	Male n=85 n(%)	Female n=64 n(%)
Buccal frenum	4(4.71%)	3(4.69%)
Buccal sulcus	0(0.00%)	2(3.13%)
Crest of residual ridge	2(2.35%)	3(4.69%)
Labial frenum	14(16.47%)	11(17.19%)
Lingual sulcus	50(58.82%)	32(50%)
Mylohyoid ridge	2(2.35%)	6(9.38%)
Retromolar pad	11(12.94%)	5(7.81%)
Slope of residual ridge	2(2.35%)	2(3.13%)
Mandibular torus	0(0.00%)	0(0.00%)
Labial sulcus	0(0.00%)	0(0.00%)

The number of mandibular denture adjustments needed by male and female patients during seven appointments are indicated in Table-IV. During Adjustment One, all patients (85 males, 64 females) required adjustments. At Adjustment Four, this fell to 56 males (66%) and 41 females (64%), and again declined to 22 males (25.9%) and 18 females (28.1%) at Adjustment Six. Whereas males had marginally greater early-stage adjustments and females had marginally greater at the later stages, none were statistically significant (p>0.05 at all stages). In Adjustment One, 76 males (89.4%) and 55 females (85.9%) needed modifications. The requirement for adjustments gradually decreased, with just 1 patient of each gender (1.2%) needing adjustment by Appointment Six. Males consistently indicated slightly greater adjustment frequencies at all stages but no statistically significant difference was seen between the sexes (p>0.05 at all stages). At Appointment Seven, no more adjustments were required (Table-V).

Table-III: Distribution of Maxillary Denture-Related Traumatic Ulcerations by Anatomical Site and Gender (n=149)

Anatomical Site	Male n=85 n(%)	Female n=64 n(%)
Buccal frenum	2(2.36%)	6(9.38%)
Buccal sulcus	8(9.41%)	3(4.69%)
Crest of residual ridge	2(2.35%)	1(1.56%)
Maxillary tuberosity	5(5.88%)	2(3.13%)
Distobuccal sulcus	10(11.76%)	8(1.56%)
Hamular notch	10(11.76%)	6(9.38%)
Incisive papilla	2(2.35%)	1(1.56%)
Labial frenum	3(3.53%)	3(4.69%)
Labial sulcus	1(1.18%)	1(1.56%)
Posterior palatal seal	36(42.35%)	29(45.31%)
Palatal torus	2(2.35%)	0(0.00%)
Rugae	2(2.35%)	0(0.00%)
Hard palate	0(0.00%)	0(0.00%)
Midpalatal suture	0(0.00%)	0(0.00%)

Table-IV: Gender-wise Distribution of Mandibular Denture Adjustment Requirements across Follow-up Appointments (n=149)

Adjustment stage	Requirement	Male n=85 n(%)	Female n=64 n(%)	p-value
Adjustment One	Yes	85(100.00%)	64(100.00%)	-
	No	0(0.00%)	0(0.00%)	
Adjustment Two	Yes	82(96.47%)	63(98.44%)	0.423
	No	3(3.53%)	1(1.56%)	
Adjustment Three	Yes	78(91.76%)	59(92.19%)	0.587
	No	7(8.24%)	5(7.81%)	
Adjustment Four	Yes	56(65.88%)	41(64.06%)	0.476
	No	29(34.12%)	23(35.94%)	
Adjustment Five	Yes	39(45.88%)	27(42.19%)	0.389
	No	46(54.12%)	37(57.81%)	
Adjustment Six	Yes	22(25.88%)	18(28.13%)	0.451
	No	63(74.12%)	46(71.88%)	
Adjustment Seven	Yes	9(10.59%)	12(18.75%)	0.119
	No	76(89.41%)	52(81.25%)	

Table-V: Gender-wise Distribution of Maxillary Denture Adjustment Requirements across Follow-up Appointments(n=149)

Adjustment stage	Requirement	Male n=85 n(%)	Female n=64 n(%)	*p*-value
Adjustment One	Yes	76(89.41%)	55(85.94%)	0.346
	No	9(10.59%)	9(14.06%)	
Adjustment Two	Yes	52(61.18%)	38(59.38%)	0.478
	No	33(38.82%)	26(40.63%)	
Adjustment Three	Yes	27(31.76%)	21(32.81%)	0.515
	No	58(68.24%)	43(67.19%)	
Adjustment Four	Yes	15(17.65%)	9(14.06%)	0.361
	No	70(82.35%)	55(85.94%)	
Adjustment Five	Yes	6(7.09%)	2(3.13%)	0.250
	No	79(92.94%)	62(96.88%)	
Adjustment Six	Yes	1(1.18%)	1(1.56%)	0.676
	No	84(98.82%)	63(98.44%)	
Adjustment Seven	Yes	85(100.00%)	64(100.00%)	-
	No	0(0.00%)	0(0.00%)	

DISCUSSION

In the present research, there was a progressive reduction in the requirement for post-insertion denture adjustments during the seven follow-up visits, where 77.7% of patients needed adjustments at the initial visit, gradually reducing to 43.9% by the third and 0% by the seventh. The most adjustments were found during the first visit, mostly in the mandibular arch, while further visits had a significant reduction in complaints and required changes. There was no statistically significant difference ($p>0.05$) observed between females and males when adjustments were required in all follow-up phases.

Our results concur with some published studies examining post-insertion complications and denture adjustment requirements. Alzoubi *et al.,* had mentioned that 92.3% of patients had mucosal ulcers necessitating adjustments on the first post-insertion visit, with a significant drop to 8.5% in the fourth week,[11] attributing the trend to soft tissue adaptation and occlusal adjustments on early visits. Likewise, Sharma *et al.,* reported that 88.6% of the patients had alterations by the first week, mainly due to ulcerations and discomfort, which decreased to 10.2% after four visits.[12] The findings of this current study are in line with this pattern, with 89.4% of males and 85.9% of females experiencing maxillary adjustments by the first visit, followed by an abrupt drop off by the sixth and seventh visits. In a comparative study carried out by D'Souza *et al.,* in 2025, conventionally complete denture wearers required significantly more adjustments in the first 2–3 weeks, and 73% of the patients required multiple interventions.[13] However, further modifications were not required after six weeks, indicating stabilization of fit and improved neuromuscular coordination over time. In addition, Khan *et al.,* saw a 67.5% incidence of traumatic ulceration with fresh conventional dentures, with the mandibular arch involved more often than the maxillary, presumably because of variations in denture base stability and load transfer.[14] Though the present research did not establish a statistically significant gender variation, the regularly higher adjustment frequency in men could be due to greater occlusal forces or different adaptation thresholds, as likewise proposed by Sharma *et al.*

Non-adaptation to new complete dentures, especially in the mandibular arch, is still a clinical challenge and has been attributed to several factors such as ridge shape, patient expectation, and neuromuscular coordination. Ribeiro *et al.,* noted that 21.3% of the patients did not adapt completely to mandibular dentures, with residual ridge shape and initial discomfort mentioned as key predictors of non-adaptation.[15] In the same manner, Ünal *et al.,* established that oral discomfort, especially mucosal pain and mandibular denture instability, notably affected oral health-related quality of life scores, which places emphasis on initial post-insertion care.[16] In line with this, Sdiq *et al.,* indicated that more than 70% of users of complete dentures had at least one post-insertion complication in the first two weeks, with the majority being mucosal ulceration, poor retention, and speech complaints.[17] These observations are consistent with our findings, where a high incidence of maxillary and mandibular adjustments during the early visits was documented to highlight the necessity for early intervention to provide maximum adaptation. In addition, Almeida *et al.,* showed that pre-insertion detection of super-compression areas using special impression techniques greatly minimized post-insertion trauma and enhanced comfort during the first month of wear.[18] Such anticipatory measures might optimize clinical outcomes and minimize the frequency of repeated adjustments evidenced during initial adaptation.

While patient age is a significant biological variable that may affect mucosal resistance and ridge shape, the current study was structured as a descriptive prevalence survey centered on post-insertion frequency, location, and quantity of denture adjustments. Hence, only descriptive age statistics were provided. Larger samples in future studies might

investigate possible correlations between age and post-insertion problems.

LIMITATION OF STUDY

A limitation of the current research is the comparatively small and uneven sample size between men and women, which could have affected the potential to generalize the findings. The research also used observational measurement within the post-insertion adaptation time, which brings with it the potential for examiner bias and subjective judgement. In addition, patient self-report measures of discomfort and adaptation were not quantitatively assessed using accepted measures such as OHIP-EDENT, which might circumscribe the depth of psychosocial impact evaluation. The study was limited to one clinical practice as well, limiting external validity to other populations or clinical settings.

CONCLUSION

The findings of the study highlighted a higher incidence of adjustment requirements in the mandibular arch compared to the maxillary arch following complete denture insertion, but there was no significant difference between male and female patients at all stages of adjustment. The greatest need for post-insertion adjustments was seen at the first visit, especially for mandibular dentures, to highlight the significance of an early follow-up.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

ZA & AI: Data acquisition, data analysis, critical review, approval of the final version to be published.

BM & MS: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

KS & SA: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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