

Frequency and Location of Ulcerations in Maxillary and Mandibular Complete Denture Prosthesis in Post Insertion Visits: An In-Vivo Study on Indian Population.

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Abstract

Aim: Complete denture patients often complaint with ulcerations and other problems following complete denture insertion. The aim of the present study is to have an estimate of minimum number of post insertion visits required for satisfaction of a complete denture patient and to have an estimate of the common location of ulcers in both the arches.

Materials and method: 100 edentulous patients, 76 males and 24 females were selected for the study and complete dentures were fabricated for all the patients. Dentures were checked for any other flaws and inserted to the patient's mouth. Patients were instructed to report on 1,2,3,5,7,10,15,30,45, and 60 days following delivery of dentures and denture adjustments were carried out on these visits. The mucosal injuries, erythematous areas and ulcerations were located in each post insertion visit and tabular charts were prepared to record the data which was analyzed statistically.

Statistical analysis: Analysis of variance and Student 't' test.

Result: 94% of patients reported back for 1st post insertion recall. 90.2% of maxillary dentures and 100% of mandibular dentures were requiring adjustments in 1st post insertion recall which reduced significantly with the increase in number of post insertion visits. Number of erythematous lesions and ulcerations caused by usage of dentures were also recorded on each post insertion visit for a period of sixty days. 600 erythematous lesions and ulcerations were recorded in entire study, out of which maxillary arches had 240 lesions (40%) whereas 360 (60%) lesions were recorded in mandibular arches. The most common site of ulceration or lesion in maxillary arches was Posterior palatal seal area (35.4%) and in mandibular arches was alveoli lingual sulcus (26.1%).

Conclusion: The post insertion recall is truly a blessing in disguise as help in adaptation of dentures to the patients. On the day of insertion, the patient is nervous or curious to receive the prosthesis and many times unable to express his problem. It is always recommended to keep post insertion visits as a mandatory step in complete denture fabrication.

Keywords: Alveoli lingual sulcus, Dentures, Erythematous, Insertion, Ulceration.

I. Introduction

Prosthetic rehabilitation of a completely edentulous patient is a challenging job and needs immense training for the dentist and time for the patient to adjust to a new world of dentures. The paradigm shift from natural teeth to artificial set of dentures makes patient anxious and sometimes irritating, leading to a frustrating experience for the clinician. Multiple factors like behavior, expectations, adaptability of the patient play a vital role in predicting success of any dental prosthesis. MM House¹ classified patient's behavior in four different types and stated only philosophical and exacting types fit for carrying out dental treatment. In a study conducted by Brunello and Mandikos², 100 complete denture rehabilitated patients were studied and the most common post-insertion complaint was pain and discomfort due to mucosal injuries and traumatic ulcerations. Insertion of the complete denture is not the final step but new dawn of dentist-patient relationship³. Winkler⁴ suggests to keep 1st post insertion visit after 24 hours to allow oral tissues to adapt to new dentures.

Dervis conducted a study to access the common complaints of 600 patients three months after insertion of new dentures and found denture construction faults and poor denture bearing mucosa to be the prime reasons for patient problems. The aim of the present study was to have an estimate of minimum number of post insertion visits required for satisfaction of a patient and to have an estimate of the common location of ulcers in both the

arches. Null hypothesis states no post insertion problem following day of delivery of denture and no ulceration or redness following denture use.

II. Materials and Method

The present study was carried out on 100 patients that reported to Indira Gandhi Govt. dental college, Jammu. Out of 100 patients, 76 males and 24 females were selected for the study. [TABLE 1] Patients were informed of the objective of the study and consent was obtained from each patient.

Complete dentures were fabricated for all the patients using same materials and same techniques under the supervision of a senior prosthodontist. Primary impressions of both the arches were made using Impression compound (DPI Pinnacle) and poured in dental plaster. Full spacer advocated by Boucher in maxilla and relief over alveolar crest in mandibular casts were designed and special trays were fabricated for each patient. Peripheral tracing was carried out using green stick compound (DPI low fusing compound) and secondary impressions were made using zinc-oxide Eugenol paste (DPI Impression Paste). Casts were prepared using type III dental stone and occlusal rims were prepared using modeling Wax (Hyflex). Face-bow record; centric relation record were recorded using nick and notch method and mounted on a semi adjustable articulator. Teeth arrangement was carried out using bilateral balanced occlusal scheme followed by curing of dentures in heat cure resins (Trevalon, Dentsply). Dentures were finished and polished to high finish and inserted to the patient on the day of delivery. Dentures were checked out for retention, stability, support and all interferences in centric as well as in lateral positions were removed. All immediate post insertion complaints were entertained; patients were educated with post insertion instructions and informed to report after 24 hours following delivery. Post insertion visits were planned on 1,2,3,5,7,10,15,30,45, and 60 days following delivery of dentures and denture adjustments were carried out on these visits. The mucosal injuries, erythematous areas and ulcerations were located in each post insertion visit. Even minute redness or inflammation was treated as a mucosal injury and was recorded. Tabular charts were prepared to record the data which was analyzed statistically.

III. Results

The data obtained reveals 94 out of 100 patients (94%), out of which 74 males (97.3%) and 20 females (83.3%) reported back for 1st post insertion recall. The remaining 6 patients didn't participate in the study following day of delivery. The first post insertion visit which was scheduled 24 hours after insertion recorded 90.2% of maxillary dentures and 100% of mandibular dentures requiring adjustments. Second visit recorded 81.4% in maxillary and 86.1% in mandibular dentures. During the following appointments, the need of correction of both maxillary and mandibular prosthesis decreased significantly. The number of maxillary dentures requiring adjustments reduced to 03 in 5th visit whereas it took 8th visit in mandible to reach a level of 02. In the seventh visit, none of the maxillary dentures required adjustment. However, mandibular dentures required adjustments until the ninth visit to achieve a level of zero. In a proposed two way ANOVA multivariate model in which Post insertion complaints was considered as a dependent variable on the independent variables: Maxillary or mandibular dentures and number of post insertion visit, both the independent variables showed a significant association with outcome ($p < 0.001$). The model had a good explanatory capability ($r^2 = 0.672$) thus depicting that the model was acceptable.

Number of erythematous lesions and ulcerations caused by usage of dentures were also recorded on each post insertion visit for a period of sixty days. Out of 600 erythematous lesions and ulcerations recorded in entire study, maxillary arches had 240 lesions (40%) whereas 360 (60%) lesions were recorded in mandibular arches. The most common site of ulceration or lesion in maxillary arches was Posterior palatal seal area (35.4%) followed by Canine eminence region (19.5%), buccal sulcus (12%), coronoid notch (08%), labial frenum (07%), labial sulcus (07%), buccal frenum (05.4%), maxillary tuberosity (03.3%) and least in Hard palate (0.8%) and alveolar ridge (0.4%). The order of mandibular lesions were highest in alveoli lingual sulcus (26.1%) followed by mylohyoid ridge (23.3%), buccal shelf area (14.7%), retromolar pad (11.1%), lingual frenum (07.7%), buccal frenum (05.2%), alveolar ridge (03.3%), labial frenum (3%), Labial sulcus (2.7%) and lowest in buccal sulcus (02.2%).

IV. Discussion

The art and science of denture fabrication has advanced notably in last 30 years. The progress is attributed to the fact that dentists have understood the warmth of the patient-dentist relation. The zeal to better understand oral anatomy, more familiarity with the biocompatible materials and better understanding of the oral biomechanics has lead to remarkable success rate in denture fabrication ultimately benefitting our patients. Though, we have improved a lot, still post insertion complaints following denture fabrication is a routine problem among dental practioners. Sometimes, the repeated visits by the patient complaining about denture prosthesis again and again become a nightmare for the dentist which finally weakens the trust implied by the

patient on the dentist. Heartwell⁶ states to use the term Problem in lieu of Complaint as latter signifies dissatisfaction. Post insertion Problem means 'a situation which can be proposed for solution'.

This solution is achievable by maintenance of patience and trust on part of the patient and skill, knowledge and experience by the dentist. Schuller⁷ states that oral discomfort associated with a poor prosthesis has a delirious effect on the general nervous system and may result in general organic dysfunction. Many pathetic, emaciated neurotics have received medical treatment and never could be restored to health until they received oral comfort, which is made possible only with a competent rendering of prosthetic service. The null hypothesis that no post insertion problem and no ulceration or erythematous reaction following day of delivery of denture stands rejected as almost all the patients had one or other post insertion problem following day of delivery. 100 subjects including 76 males and 24 females were included in the study and dentures were fabricated for them using same techniques and materials under the supervision of a single person so as to avoid any bias in the study. The results of the present study state that 94% patients reported for post insertion recall following day of delivery. 6 patients didn't turn up after insertion due to certain personal issues. Post insertion visits were planned on 1,2,3,5,7,10,15,30,45, and 60 days following delivery of dentures so that to have disposal of patients problems at the earliest and to keep a close eye on mucosal changes. First post insertion visit recorded 90.4% of maxillary and 100% of mandibular dentures requiring adjustments. This level decreased during following appointments with minimal amount of dentures requiring adjustments after 4th adjustment in maxillary and 8th in the mandibular denture. The results of the present study are in accordance with Sadr⁸ et al and Kivovics⁹ et al who recorded 85.8% and 87% respectively in 1st post insertion visit. Cardova¹⁰ et al stated only 60.8% reported back with post insertion complaints in their study and explained increased percentage in study by Sadr⁸ et al and Kivovics⁹ et al due to more inclusion of mandibular prosthesis. This study contradicts the explanation of Cardova¹⁰ et al regarding discrepancy as though equal number of maxillary and mandibular prosthesis were used in the present study, prosthesis requiring 1st post insertion visit are more than 90% in both maxillary and mandibular dentures. An attempt to calculate minimum number of post insertion visits required to satisfy a patient was made and was found to be 04 in maxillary and 08 in mandibular arches respectively. Sadr⁸ et al calculated 05 in maxillary and 08 in mandibular which are approximately the same calculated in our study. Interestingly, during present study, it was found that single patient had complaint even during 10th visit thus, signifying the life long bond between dentist and denture patient. Also, it was found that post insertion visits can't be exactly calculated as depend on multiple factors like patient's attitude, acceptability, chewing capacity and ability to adapt to dentures.

The numbers of ulcerations or mucosal injuries were also recorded in the study with the intention to have an idea about most common possible locations of the mucosal injuries. Mandibular arches (60%) recorded more ulcerations than Maxillary arches (40%) which can be due to increased movement of mandibular prosthesis as compared to maxillary prosthesis. Decreased surface area in mandibular arches leading to decreased support and presence of tongue may be the reason of increased movement in mandibular prosthesis.³The two most common sites in maxillary arches were Posterior palatal seal area (35.4%) followed by Canine eminence region (19.5%). The two most common sites in mandibular arches were alveolo-lingual sulcus (26.1%) followed by mylohyoid ridge (23.3%). The reason of increased incidence of ulcerations in posterior palatal seal area may be due to the over scrapping of maxillary cast region or application of excessive pressure in posterior palatal seal region in a false attempt to achieve more retention⁹. Protruded cortical buccal plate and thinning of mucosa in canine region contributes to increased incidence of lacerations in Canine eminence region³. Similar studies were carried out by Kivoviks⁹ et al, Sadr⁸ et al and Cardova¹⁰ et al which stated canine fossa, maxillary tuberosity, rear seal area, medium bridle and disto-vestibular groove as common occurrence points for ulcerations in maxillary arch. In mandibular arches, the two most common sites were Alveoli-lingual sulcus and mylohyoid ridge which suggest importance of basic impression making and peripheral tracing. The overextended thick mandibular denture borders and thin mucosa over mylohyoid region may be the reason for increased injury in these regions. Buccal shelf area was also commonly traumatized which can be an attempt of the dentists to extend the denture borders more buccally to achieve more support leading to encroachment of mucosal border. Kivoviks⁹ et al, Sadr⁸ et al and Cardova¹⁰ et al reported lingual flanges, Piriform fossae and disto vestibular flank to be the common areas of lacerations in mandibular arches.

The limitations of the study include excessive visits of the patients and no differentiation of gender in samples. Further, studies are directed to consider effect of sex, chewing, occlusion and dietary habits on post insertion adjustments.

Within the limitations of the present study, it is to emphasize that duty of the clinician is not up to fabrication of a good prosthesis, but also to help a patient in adaptation of dentures. Post insertion visit should be considered as a final step in complete denture fabrication and pressure indicating paste should be used in routine practice during insertion and post insertion visits so that to check out any overextended or pressure area and get it corrected. Proper instructions and counseling should be given to each and every patient to minimize his struggle for adaptation with the dentures.

References

- [1]. Engelmeier RL, Phoenix RD. Patient evaluation and treatment planning for complete denture therapy. *Dent Clin North Am* 1996;40:1-18.
- [2]. Brunello DL, Mandikos MN. Construction faults, age, gender, and relative medical health: factors associated with complaints in complete denture patients. *J Prosthet Dent* 1998; 79:545-54.
- [3]. Zarb GA, Bolender CL, Eckert S, Jacob R, Fenton A, Mericske-Stern R. *Prosthetic Treatment for Edentulous Patients*, 12th ed. St Louis: Mosby; 2004: 419-26.
- [4]. Winkler S. *Essentials of complete denture prosthodontics*; 2nd ed. Delhi; 2009: 39-55.
- [5]. Dervis E. Clinical assessment of common complaints with complete dentures. *Eur J Prosthodont Restorative Dent* 2002; 10:113-117.
- [6]. Rahn A, Heartwell C. *Textbook of complete dentures*, 5th ed. New delhi: Elsevier; 2003:131-67.
- [7]. Swenson M, Stout C. *Complete dentures*, 4th ed. St Louis: Mosby; 1959:9-10.
- [8]. Sadr K, Mahboob F, Rikhtegar E. Frequency of traumatic ulcerations and post-insertion adjustment recall visits in complete denture patients in an Iranian Faculty of Dentistry. *J Dent Res Dent Clin Dent Prospect*. 2011;5:46-50.
- [9]. Kivovics P, Jahn M, Borbely J, Marton K. Frequency and location of traumatic ulcerations following placement of complete dentures. *Int J Prosthodont*. 2007;20: 397-401.
- [10]. Cordova C, Valdés A, Jorquera G, Mahna E, Fernández E. Distribution of traumatic injuries after the installation of complete dentures in adult patients. *Rev Clin Periodoncia Implantol Rehabil Oral*. 2016;9:48-53.

S.No.	Inclusion Criteria
1.	Age limit from 40 years to 70 years.
2.	No systemic disease like diabetes or bone disorder.
3.	No presence of bony undercuts and unhealed sockets.
4.	Physiologic or exacting behavior of patients.
5.	Absence of sharp ridges and flabby tissues.
6.	No tobacco use
7.	Mentally alert

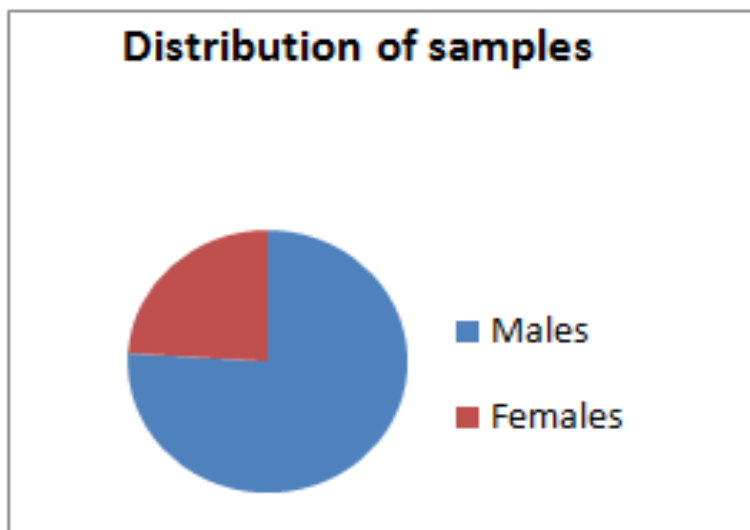
Table 1: Inclusion Criteria.

No. of visit	Days after insertion	Maxilla	Mandible
1.	1 day	85	94
2.	2 days	77	81
3.	3 days	34	64
4.	5 days	17	57
5.	7 days	03	34
6.	10 days	01	28
7.	15 days	00	11
8.	30 days	00	02
9.	45 days	01	00
10.	60 days	02	01

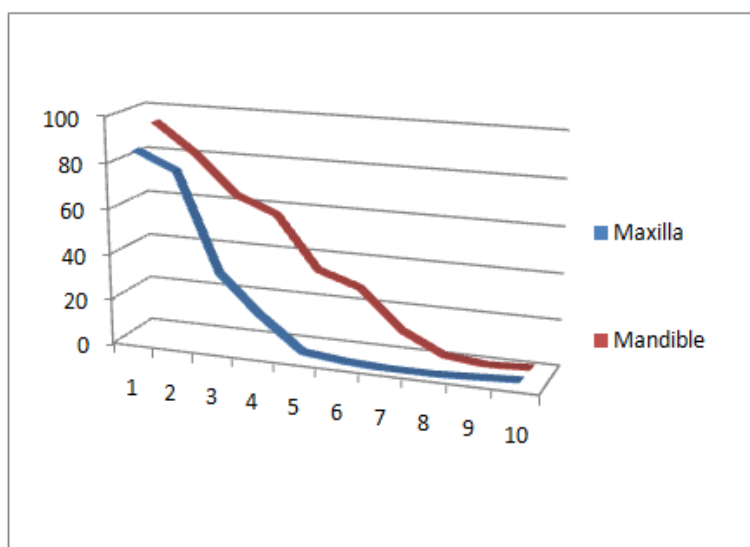
Table 2: Number of prosthesis requiring post insertion adjustments in subsequent visits.

Total number of corrections = 600				
S.No.	Maxilla (240 corrections) [40%]		Mandible (360 corrections) [60%]	
1.	Alveolar ridge	01 (0.41%)	Alveolar ridge	13 (03.3%)
2.	Labial frenum	17 (07.08%)	Labial frenum	11 (03.03%)
3.	Buccal Frenum	13 (05.4%)	Buccal Frenum	19 (05.2%)
4.	Labial Sulcus	17 (07.08%)	Labial Sulcus	10 (02.7%)
5.	Buccal Sulcus	29 (12%)	Buccal Sulcus	08 (02.2%)
6.	Posterior palatal seal area	85 (35.4%)	Lingual frenum	28 (07.7%)
7.	Hard Palate	02 (0.8%)	Alveolar lingual sulcus	94 (26.1%)
8.	Coronoid notch	21 (08.7%)	Buccal shelf area	53 (14.7%)
9.	Canine eminence	47 (19.5%)	Retromolar pad	40 (11.1%)
10.	Maxillary tuberosity	08 (03.3%)	Mylohyoid ridge	84 (23.3%)

Table 3: Location of mucosal injuries or ulcerations.



Graph 1: Distribution set-up.



Graph 2: Frequency diagram depicting number of post insertion adjustments in maxillary and mandibular arches.