

# The Incidence of Occlusal Disturbances and its Causes in Complete Denture Patients

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## Abstract

**Aim:** The aim of the present study is to evaluate the incidence of occlusal disturbances and its various causes in the Complete Denture patients.

**Materials and Methods:** 120 patients aged 60 years and above visiting the OPD District Hospital, Kathua, J&K for occlusion related problems were selected for the study. Patient's clinical record was accessed for the detailed data of subjects like age, gender, ridge relationship, occlusal scheme. The performance of a clinical remount from patients' treatment records was also evaluated. A calibrated examiner trained for specific purpose determined the presence of occlusal disturbance. The incidence of occlusal disturbance was noted and the role of the factors causing it was evaluated and analyzed using Chi-square analysis. The results were considered significant at  $p < 0.05$ .

**Results:** Out of 107 patients, 31 patients (28.8%) showed occlusal disharmony. No statistically significant relationship was found between occlusal disharmony and age, gender, ridge relationships, or occlusal scheme ( $p < 0.5$ ). Twenty-five (81%) out of 31 complete dentures with occlusal disharmony were not clinically remounted. There was a highly significant relationship between the absence of clinical remounting and occlusal disharmony ( $p < 0.001$ ).

**Conclusion:** Within the limits of this study, the prevalence of occlusal disharmony was noticeable. A randomized clinical trial is strongly recommended to investigate factors related to the incidence of occlusal disharmony.

**Key words:** Complete denture, Occlusal disturbance, Prosthodontics, Incidence

## INTRODUCTION

Complete dentures are prosthetic replacements which are fabricated to restore impaired functions and appearance. Fabrication of complete dentures comprises clinical and laboratory procedures, whose precise execution is of crucial importance for achieving success.<sup>[1]</sup>

Historically complete denture prosthodontics has been at the forefront of the study of occlusion and many of the

terms used in occlusion have their origin in this subject. The reason that occlusion has always been a consideration in the provision of removable complete prosthetics is because the adoption of good occlusal practice has a significant and immediate impact on the overall success of the treatment, as it affects denture stability. If an inappropriate occlusion is built into a denture then the patient will be unlikely to be able to accommodate to that denture and the dentist will be immediately aware that the treatment has been unsuccessful. The reason why the correct distribution of occlusal forces is so important in the design of removable prosthetics is because the prosthetic teeth that provide the occlusion are not directly attached to the patient.<sup>[2]</sup>

Fabrication of dentures involves many separated but related procedures regardless of the techniques or instruments used for making impression, making jaw relation records, arranging teeth in balanced occlusion and processing the

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dentures. An error in any one of the procedure contribute to error in the occlusion of complete denture. The inaccuracies of the material and methods used to fabricate dentures at this stage must be recognised and eliminated before the patient wears the denture. These errors can result of:

- Technical errors or errors made by the dentist.
- Technical errors developed during the laboratory procedures.
- Inherent deficiencies of the materials used in the construction of the dentures.

The occlusal errors may result from variety of reasons including change in state of health of temporomandibular joints, inaccurate maxillomandibular relation record made by the dentist, errors in transfer of the maxillomandibular relation records to the articulator, ill-fitting temporary record bases, failure to use facebow and subsequently changing the vertical dimension on the articulator, incorrect arrangement of posterior teeth.<sup>[3]</sup>

Good-quality dentures with a harmonious occlusion lead to patient satisfaction with their dentures as well as with the high level of masticatory performance and efficiency. Such patients adapt to their dentures much faster than individuals with occlusal disharmony.<sup>[4567]</sup>

Variety of reasons may be responsible for occlusal disturbances, which are also sparsely documented in literature; hence the present study is conducted to determine the incidence of occlusal disturbances in centric relation and its associated reasons.

## MATERIALS AND METHODS

120 patients aged 60 years and above visiting the OPD of District Hospital, Kathua, J&K for complete denture were included in the study. Patient's clinical record was accessed for the detailed data of subjects like age, gender, ridge relationship, occlusal scheme. The performance of a clinical remount from patients' treatment records was also evaluated.

A calibrated examiner trained for specific purpose determined the presence of occlusal disturbance.

### Inclusion Criteria

Subjects who were delivered with a complete denture and then were introduced into the study no more than 15 days after placement of their new dentures.

### Exclusion Criteria

Subjects with removable partial dentures, immediate dentures, over dentures, implant-assisted prosthetics.

In order to locate the occlusal contacts, a remounting procedure was done for each complete denture. Clinical Remount is defined as a procedure where occlusal refinement is carried out on the articulator after remounting the dentures with new records obtained from the patient.<sup>[8]</sup>

The orientation jaw relation that orient the mandible to the cranium in such a way that when mandible is kept in its most posterior position, the mandible can rotate in sagittal plane around an imaginary transverse axis passing through or near the condyles was evaluated using the facebow.<sup>[9]</sup> The mandibular denture was stabilized by placing both index fingers of the operator intraorally on the buccal flanges and the thumbs placed extraorally on the chin while guiding the mandible into centric relation. Centric relation was recorded using bite registration material (Jet Bite- Coltene). Maxillary and mandibular complete dentures were then mounted on a articulator (Hanau H2).

40 micron articulating paper (Bausch Arti Check) was used to evaluate actual contact of the teeth by tactile sensation.

Occlusal disturbance or disharmony is defined as the absence of simultaneous bilateral contacts of the opposing posterior teeth in centric relation of the jaws. The total numbers of occlusal contacts for each complete denture were measured, and less than three occlusal contacts between the left and right posterior teeth are considered to constitute occlusal disharmony.

The ridge relationships (Classes I, II, and III) and the occlusal schemes were observed extraorally on the articulator.

### Statistical Analyses

The incidence of occlusal disturbance was noted and the role of the factors causing it was evaluated and analyzed using Chi- square analysis. The results were considered significant at  $p < 0.05$ .

## RESULTS

This study was conducted on 120 completely edentulous subjects wearing complete dentures among which 58 (48.33%) were males and 62 (51.66%) were females. The age groups considered for the study were less than and greater than 60 years. Table 1 showed that out the 120 subjects, 61.4% subjects with occlusal disturbance absent were less than the age of 60 years whereas 38.6% of the subjects were 60 years and above. In subjects showing occlusal disturbance, 62% were below 60 years of age and 37.8% were in the age group of 60 years and above. There was no statistically significant relationship between occlusal disharmony and age of the subjects.

Table 2 showed that out of the total male and female subjects, 51.4% males and 48.6% females showed occlusal disturbance where as 46.98% males and 53.01% females showed no occlusal disturbance. There was no significant relationship between occlusal disharmony and gender of the subjects.

Table 3 showed that out of the subjects who showed no occlusal disturbance, 67.5% were having class I ridge relationship and 32.5% were with class II and class III ridge relationship. Similarly in patients with occlusal disturbance present 72.97% were having class I ridge relationship and 27.02% showed class II and class III ridge relationships. No significant relationship was found between ridge relationship and occlusal disharmony.

Table 4 showed that out of the subjects, who were without any occlusal disturbance, 73.5% were with anatomic occlusal scheme and 26.5% were with semi and non anatomic occlusal scheme. Similarly in patients with occlusal disturbance present 64.8% were having anatomic occlusal scheme and 35.13% were with semi and non anatomic occlusal scheme. There was no significant relation between occlusal disharmony and occlusal scheme.

Table 5 showed that a clinical remount procedure was performed for 81(67.5%) patients, while the remaining

39 (32.5%) had no remount procedure done. Of 37 cases with occlusal disharmony, 4 (10.81%) were in the remounted group, whereas 33 (89.1%) were in the group of patients with no clinical remount performed. This demonstrates a highly significant relationship between the absence of clinical remount and occlusal disharmony ( $p=0.0000$ ).

## DISCUSSION

In the present study, 120 subjects were evaluated to find the incidence of occlusal disturbances and its various causes in the Complete Denture patients. The occlusion of complete dentures given to the patients were assessed using a clinical remount procedure to adjust the occlusion of the dentures after fabrication in the lab, which prevents irreversible damage to the supporting tissues to the supporting tissues.

The present study showed a statistically highly significant relationship between occlusal disturbance and the absence of the clinical remount procedure ( $p=0.000$ ), which is in accordance with the results of various studies.<sup>[10-15]</sup> However, our study is not in agreement with the studies done by Wilson and Rees and Firtell *et al.*<sup>[12,15]</sup> wherein they showed the use of articulating paper between the occlusal surfaces of complete dentures.

Various authors have stated that the clinical remount procedure results in a highly significant improvement in the comfort of upper dentures and better fit of lower dentures.<sup>[16,17]</sup>

The results of our study are in accordance with the study done by Atashrazm P. *et al.*, factors such as age, gender, ridge relationships, and occlusal scheme or posterior

**Table 1: Distribution of occlusal disturbances in terms of age**

Contributing factors	Occlusal disturbance present (%) n=37	Occlusal disturbance absent (%) n=83	P value
Age			
<60 years	23 (62)	51 (61.4)	P=0.9625
60 years and above	14 (37.8)	32 (38.6)	

**Table 2: Distribution of occlusal disturbances in terms of gender**

Gender	Occlusal disturbance present (%) n=37	Occlusal disturbance absent (%) n=83	P value
Male	19 (51.4)	39 (46.98)	P=0.6587
Female	18 (48.6)	44 (53.01)	

**Table 3: Distribution of occlusal disturbances in terms of ridge relationship**

Ridge relationship	Occlusal disturbance present (%) n=37	Occlusal disturbance absent (%) n=83	P value
Class I	27 (72.97)	56 (67.5)	P=0.5466
Class II and Class III	10 (27.02)	27 (32.5)	

**Table 4: Distribution of occlusal disturbances in terms of occlusal scheme**

Occlusal scheme	Occlusal disturbance present (%) n=37	Occlusal disturbance absent (%) n=83	P value
Anatomic	24 (64.8)	61 (73.5)	P=0.3369
Semi and non anatomic	13 (35.13)	22 (26.5)	

**Table 5: Distribution of occlusal disturbances in terms of clinical remounting of CD**

Clinical remount	Not present (%) (n=83)	Present (%) (n=37)	P value
Performed	77 (92.77)	4 (10.81)	0.0000**
Not performed	6 (7.22)	33 (89.18)	

\*\*Highly significant

occlusal forms were not significantly associated with occlusal disharmony.<sup>[10]</sup>

Firtell *et al.* also concluded that the absence of a clinical remount procedure introduced most of the oral damage, and different occlusal forms were not significant.<sup>[12]</sup>

The limitation of the current study is that the study was conducted on the basis of centric relation position of the jaws and eccentric interferences were not taken into consideration. More over the use of pressure indicator paste or newer methods of measuring occlusal disturbances like T scan could have been done. Therefore, other studies overcoming these drawbacks should be conducted in future

## CONCLUSION

Within the limits of this study, the prevalence of occlusal disharmony was noticeable. A randomized clinical trial is strongly recommended to investigate factors related to the incidence of occlusal disharmony which overcomes the shortcomings of the present study.

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