Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies *NLM ID: 101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 100

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Comparison of the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures

[1]Sinony Srujana, [2]Sosan Fatima, [3]Yeka Jyothirmayee Sravani, [4]Kavitha Vislawath, [5]Nikhil Kumar Bijjala, [6]Siddhi Pershad

[1-6]Post Graduate Student, Department of Prosthodontics, Malla Reddy Institute of Dental Sciences, Malla Reddy Vishwavidyapeeth, Hyderabad, India

ABSTRACT:

Background: In addition to the placement of the mandibular and maxillary teeth, complete denture occlusion is a crucial component of the stomatognathic system. The present study compared the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures. **Materials & Methods:** 50 edentulous patients of both genders were divided into 2 groups of 25 patients each. Group I with bilateral balanced occlusion dentures and the group II with canine guidance. After 3 months, bilateral balanced occlusion scheme was converted to canine guidance and vice-versa for further 3 months. The influence of the two occlusal concepts on masticatory efficiency was determined using photocolorimeteric test. **Results:** Group I had 13 males and 12 females and group II had 11 males and 14 females. The mean masticatory efficiency was 60.2% in group I and 58.3% in group II. The difference was significant (P< 0.05). **Conclusion:** Particularly in healthy patients with well-formed residual alveolar ridges, the kind of occlusal design did not appear to have a substantial impact on the masticatory efficiency of edentulous patients. Since canine guided occlusion is straightforward, easy, and takes less time than bilateral balanced occlusion—which is more costly, technique-sensitive, and necessitates more intraoral adjustments and follow-ups—it can be recommended as a substitute for bilateral balanced occlusion in complete dentures.

Keywords: canine guidance occlusion, masticatory efficiency, photocolorimeteric test

Received: 10 March, 2025 Accepted: 28 April, 2025 Published: 10 May, 2025

Corresponding author: Sinony Srujana, Post Graduate Student, Department of Prosthodontics, Malla Reddy Institute of Dental Sciences, Malla Reddy Vishwavidyapeeth, Hyderabad, India

This article may be cited as: Srujana S, Fatima S, Sravani YJ, Vislawath K, Bijjala NK, Pershad S. Comparison of the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures. J Adv Med Dent Scie Res 2025; 13(5):51-53.

INTRODUCTION

In addition to the placement of the mandibular and maxillary teeth, complete denture occlusion is a crucial component of the stomatognathic system. It must be designed to carry out the different tasks effectively and with the least amount of damage to the tissues that support it.[1] Occlusion is a crucial part of the technical process in the production of complete dentures and is intimately linked to the physical characteristics of load distribution, denture retention, and stability. The occlusal scheme dictates the arrangement of occlusal contacts between opposing teeth during centric relation and mandibular functional motions. The structure and arrangement of occlusal contacts in both natural and artificial dentition is referred to as the "occlusal scheme."[2] Because it affects the muscle activity during the mastication process, an ideal occlusal scheme is the most important and crucial component in the design of a complete denture prosthesis. For the creation of complete dentures, a number of occlusion and articulation concepts, including bilateral balanced, neutrocentric, lingualized, monoplane, and canine guiding occlusion, have been promoted during the past century.[3] The most common occlusal concept for edentulous patients is a balanced articulation, which is the bilateral simultaneous contacting of the mandibular and maxillary teeth in the anterior & posterior occlusal areas in centric and eccentric positions. This concept served as the foundation for all subsequent occlusion concepts. Because this kind of occlusion increases the grinding surface in contacts

at each centric and eccentric movement, it is thought to improve masticatory performance.[4]

By vertically and horizontally overlapping the canines, the anterior canine guiding occlusal scheme disengages the posterior teeth during all eccentric mandibular movements and is significantly simpler to accomplish.[5] The idea of canine guiding occlusion is thought to lessen muscle activity during lateral excursive and protrusive mandibular movements.[6] The present study compared the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures.

MATERIALS & METHODS

The study was carried out on 50 edentulous patients of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The patients were divided into 2 groups of 25 patients each. Group I with bilateral balanced occlusion dentures and the group II with canine guidance. After 3 months, bilateral balanced occlusion scheme was converted to canine guidance and vice-versa for further 3 months. The influence of the two occlusal concepts on masticatory efficiency was determined using photocolorimeteric test. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table: I. Distribution of patients

	Group I	Group II
Method	Bilateral Balanced occlusion CD	Canine guidance Occlusion CD
M:F	13:12	11:14

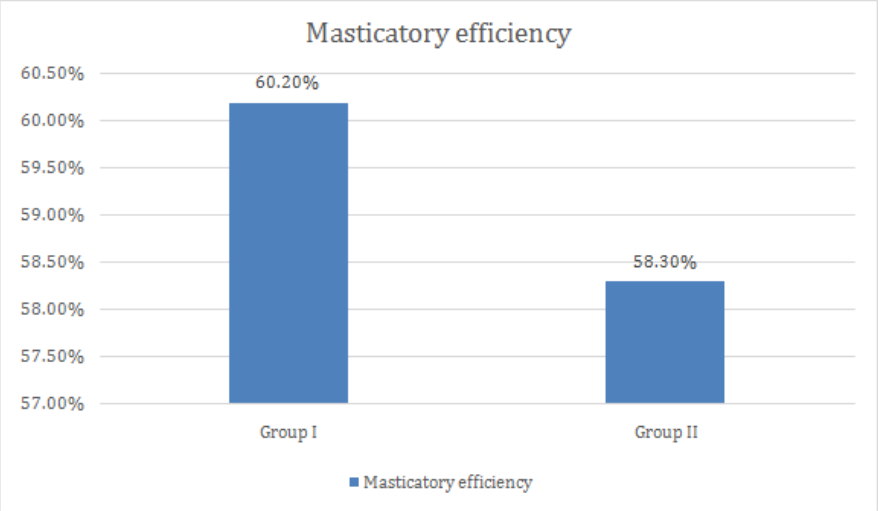
Table I shows that group I had 13 males and 12 females and group II had 11 males and 14 females.

Table: II Assessment of masticatory efficiency

Groups	Masticatory efficiency	P value
Group I	60.2%	0.59
Group II	58.3%	

Table II, graph I shows that mean masticatory efficiency was 60.2% in group I and 58.3% in group II. The difference was significant (P< 0.05).

Graph: I Assessment of masticatory efficiency



DISCUSSION

Successful integration of prostheses with patients' oral functions and psychological acceptance of their dentures are essential for the best possible outcome of edentulous patients' rehabilitation, which aims to restore lost oral structures, function, aesthetics, and speech using complete dentures. One of the first occlusion concepts to be promoted for the building of complete dentures was bilateral balanced occlusion, which calls for the continuous contact of as many mandibular and maxillary artificial teeth as possible at all eccentric mandibular movements and centric relation.[7]

One of the different occlusion methods recommended for complete dentures is canine guiding occlusion, which overlaps the canines both vertically and horizontally to disengage the posterior teeth during excursive mandibular motions.[8] Thus, in centric occlusion, both occlusion schemes have occlusal contacts at the same time, but during eccentric motions, these occlusal contacts vary between the two occlusion schemes. There is little scientific evidence to support bilateral balanced occlusion as the optimum

occlusal concept in complete dentures, despite the fact that it has long been thought to be a vital component of successful treatment.[9] The present study compared the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures.

We found that group I had 13 males and 12 females and group II had 11 males and 14 females. Duggal et al[10] compared the masticatory efficiency with bilateral balanced occlusion and canine guidance occlusion in complete dentures. The study was conducted on 30 patients. The patients were randomly divided into two groups of 15 patients each, one with bilateral balanced occlusion dentures and the other with canine guidance. After 3 months, bilateral balanced occlusion scheme was converted to canine guidance and vice-versa for further 3 months. The influence of the two occlusal concepts on masticatory efficiency was determined using photocolorimeteric test. The masticatory efficiency was greater with bilateral balanced occlusion complete dentures but the difference was statistically nonsignificant as compared to canine guided complete dentures. The results of the study suggested that canine guidance occlusion concept can also be used in complete dentures as it is simple, easy and less time consuming as compared to bilateral balanced occlusion.

We found that the mean masticatory efficiency was 60.2% in group I and 58.3% in group II. Neto, Junior & Carreiro[11] also found no significant difference between both the occlusions regarding the objective assessment of masticatory efficiency. They observed the mean data regarding the objective assessment of masticatory efficiency was 0.186 abs & 0.167 abs for bilateral balanced occlusion dentures and canine guided dentures respectively. Abs is the unit to assess the absorbance of artificial dye used in their objective method. Their data showed better mastication performance for bilateral balanced occlusion.

Peroz et al[12] argued that since bilateral balanced occlusion was not the primary occlusal principle, the canine guiding occlusal idea could also be successfully applied to complete dentures. According to them, patients initially experienced some challenges adjusting to canine-guided dentures, such as denture ulcers, but they soon adjusted to the canine-guided occlusion and showed improved chewing ability and mandibular denture retention compared to bilateral balanced dentures.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that particularly in healthy patients with well-formed residual alveolar ridges, the kind of occlusal design did not appear to have a substantial impact on the masticatory efficiency of edentulous patients. Since canine guided occlusion is straightforward, easy, and takes less time than bilateral balanced occlusion—which is more costly, technique-sensitive, and necessitates more intraoral adjustments and follow-ups—it can be recommended as a substitute for bilateral balanced occlusion in complete dentures.

REFERENCES

1. Avinashe VN & Nagda, SJ. A comparative study of the masticatory efficiency in complete dentures using acrylic and metal occlusal posterior teeth - Photom colorimetric analysis. J Indian Prosthodont Soc. 2010; 10(2):112-117.
2. Palla S. Occlusal considerations in complete dentures', Quintessence, 1997, 457-67.
3. Prasad KD, Prasad, BR, Bardia, A & Prasad, AD. Enhancing stability: A review of various occlusal schemes in complete denture prosthesis. Nitte University Journal of Health Science. 2013; 3(2):105-112.
4. Zarb GA, Bolender CL. Boucher's Prosthodontic Treatment for Edentulous Patients- Complete Dentures and Implant Supported Prosthesis. Edn 12, 2004, Mosby.
5. Beck HO. Occlusion as related to complete removable prosthodontics. J Prosthet. Dent. 1972; 27(3):246-256.
6. Abbas FS, Elgindy NA & AbdElmonem EM. Colorimetric Comparative Analysis of Masticatory efficiency in Complete Denture Wearers with Two different occlusal concepts. Alexandria Dental Journal. 2016; 41:117-121.
7. Santos CE, Freitas OD & Spadaro ACC. Development of a Colorimetric System for Evaluation of The Masticatory Efficiency. Braz Dent J. 2006; 17(2)95-99.
8. Afjal M, Majeed IM, Mirza BQ. Assessment of patient satisfaction and masticatory efficiency with balanced occlusion compared to canine guided occlusion in complete denture wearers. Pakistan Oral & Dental Journal. 2017; 37(3):504-509.
9. Rehmann P, Balkenhol M, Ferger P, Wostmann B. Influence of the occlusal concept of complete dentures on patient satisfaction in the initial phase after fitting: Bilateral balanced occlusion vs canine guidance. The International Journal of Prosthodontics. 2008; 21:60-61.
10. Nidhi Duggal, Sarabjit Kaur, Maninder Kaur, Kanav Garg, Jatinder Kumar, Rajinder Kumar. Comparison of canine guidance and bilateral balanced occlusion concepts of complete dentures on patients' masticatory efficiency: An in vivo study. International Journal of Applied Dental Sciences 2020; 6(2): 577-582.
11. Neto AF, Junior WM & Carreiro AFP. Masticatory efficiency in denture wearers with bilateral balanced occlusion and canine guidance. Braz. Dent. J. 2010; 21(2):165-169.
12. Peroz I, Leuenberg A, Haustein I & Lange KP. Comparison between balanced occlusion and canine guidance in complete denture wearers - A clinical, randomized trial. Quintessence International. 2001; 34(8):607-612.