Lingualized Occlusal Scheme : A Review of literature

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Abstract

Improved patient's acceptance in terms of function, esthetics, and comfort is the primary goal of a dentist to rehabilitate completely edentulous patients. Research aiming specifically at occlusal concept and occlusal schemes that is better for the overall welfare of the patient has been on high priority today. Till date there are various concepts, techniques and philosophies available for the dentist's to choose according to the requirements of the patient. One of the recent focuses of interest has been the lingualized occlusion concept. The aim of this concept is to provide better esthetics and denture stability than other occlusion schemes available. This paper presents its applications in various anteroposterior and buccolingual arch discrepancies including a wide variety of clinical situations.

Key words: Lingualized occlusal concept, occlusal schemes, monoplane occlusion, maximum intercuspation.

Introduction

Occlusal scheme in simple words is defined as the form and the arrangement of the occlusal contacts in natural and artificial dentition. The choice of an occlusal scheme will determine the pattern of occlusal contacts that exist between opposing teeth during various functional movements of the mandible. That is why the occlusal scheme is an important factor in the design of complete dentures. To accommodate the special needs posed by highly resorbed residual ridges and abnormal skeletal relations that are not class I, the lingualized scheme of occlusion was designed. It is characterized by contacts of only the lingual cusps of the maxillary teeth with the lower teeth and maxillary buccal cusps are raised above the occlusal plane. The lingualized occlusal concept represents an occlusal scheme that uses special tooth molds specifically designed to improve maximum intercuspation and an absence of deflective occlusal contacts in centric and eccentric relations. The posterior teeth selected for a lingualized occlusion differ depending on whether a balanced or a nonbalanced (monoplane type) arrangement is used. A balanced scheme usually involves a maxillary tooth with a sharply pointed lingual cusp to oppose a mandibular tooth with an occlusal table including only shallow inclines. For the nonbalanced lingualized occlusion, a flat monoplane mandibular denture tooth is selected.[1]

Discussion

Actually this concept of lingualized occlusion is not new to dentistry. Payne originally developed this concept, which was later improved by others including Dr. Albert Gerber and Earl Pound. Payne suggested that the lingualized arrangement offered the advantages of adaptation to different types of ridge relations, which provide the advantages of maximum intercuspation without any deflective occlusal contacts in lateral excursions. Kimoto et al.[2] compared lingualized occlusion to bilateral balanced occlusion in complete dentures and found greater satisfaction of patients with lingualized occlusion. Khamis et al.[3] examined masticatory efficiency of three occlusal forms, 0 degree, 30 degree, and lingual contact lingualized occlusion. The results demonstrated that 30 degree teeth and lingual contact provided better chewing efficiency than 0 degree teeth. Ohguri et al.[4] studied the occlusion that offers the best condition of pressure distribution on the supporting structure under a complete denture when crushing food. The results stated that the stress to the supporting tissues is smaller with lingualized and balanced occlusion than with monoplane occlusion. Tarazi et al.[5] advocated that lingualized occlusion scheme provide better esthetic than the monoplane occlusion scheme, and better stability (in case of resorbed ridges) than bilateral occlusion scheme of anatomic teeth. Mehringer advocated that the lingual cusp of maxillary posterior tooth in a lingualized occlusion penetrates the bolus like a cleaver on a butcher's block, and then operates on the bolus in a holding and grinding fashion similar to the action of a mortar and pestle. The popularity of lingualized occlusion arise from the simplicity and flexibility of the concept and from its widespread application to clinical dental practice. More recently, tooth manufacturers have specifically developed tooth molds in various combinations for lingualized articulation.[6] It include:

1. Maxillary Trubyte Functional [(0)] mold and mandibular 0° or Rational mold (Dentsply).
2. Maxillary Trubyte Anatoline [(8)] mold and the mandibular Monoline [(0)] mold (Dentsply)
3. Ortholingual maxillary and mandibular tooth molds (Ivoclar)
4. Myerson's Lingualized Integration (MLI), Austenol, Inc., Chicago.

Lingualized integration is based on the maxillary lingual cusp functioning as the main supporting cusp in harmony with occlusal surfaces of mandibular teeth. From the position of maximum intercuspation, the maxillary lingual cusp glides over the opposing teeth without any deflection during lateral and protrusive movements. Also the vertical forces are directed more centrally on the mandibular alveolar ridge, which gives the mandibular denture more stability. The maxillary posteriors can be positioned more buccal of the ridge because the lingual cusps are dominant and should be situated at the top of the maxillary ridge. In many cases, this prevents an arrangement in cross bite and improves the aesthetic aspect of the dentures. Moreover raised maxillary buccal cusps improve esthetic appearance of the prosthesis and also lift the cheek away from the occlusal plane to prevent cheek biting.[7] So this concept assure the attainment of the fundamental goals of comfort, function, and appearance in occlusal rehabilitation for edentulous patients.

Concept for various anteroposterior jaw relationships using balanced lingualized occlusion

Class I jaw relationship: In these patients the dental arches are approximately of same size with anterior portion of maxillary ridge slightly labial to the mandibular ridge.

Arrangement: Anterior denture teeth are set using esthetic and phonetic guidelines. The determinants of articulation are same as: the incisal and canine guidance angles, and the condylar guidance angles.

There is recognized classic Class I canine relationship (distal of maxillary canine ending slightly posterior to the mandibular canine). Mandibular posterior teeth are arranged before the maxillary teeth. Guidelines for mandibular teeth arrangement are: height of the anterior teeth is determined by esthetic and phonetics, the retromolar pad usually determine the occlusal plane. mandibular residual ridge incline is avoided, the lingual cusp of the mandibular posterior teeth are located in a triangle that is drawn from the distal of the canine to the buccal and lingual sides of retromolar pad, a 20 degree template may be used to design shallow anteroposterior and mediolateral compensating curves. Maxillary posterior teeth are set with the functional maxillary lingual cusp in the central groove of the mandibular tooth. The maxillary buccal cusp are elevated off the occlusal plane increasingly as one moves more posteriorly to lift cheeks away from occlusal plane. When completed, a balanced lingualized occlusion exhibit cross-arch balance in all eccentric jaw movements. Adjustments are accomplished by grinding the mandibular teeth, leaving the sharp maxillary lingual cusp untouched.

Class II jaw relationship (Retrognathic): These patients has smaller mandibular arch and located posterior to maxilla. Maxillary arch is often tapered with steep palatal vault.

Arrangement: Maxillary and mandibular anterior teeth are arranged first. Because of the severe horizontal overlap of the anterior teeth, some vertical overlap for anterior teeth for esthetics can be done without creating severe anterior dislodging forces during protrusive jaw movements. Keep the incisal guide angle shallow, less than 20 degree to reduce anterior dislodging forces and to promote posterior balance. If the incisal guide angle has to reduce to zero, select a nonbalanced lingualized occlusion. When the mandibular teeth are arranged the mandibular canines fall posterior to maxillary canine that result in posterior arch length discrepancy. This canine misalignment can be eliminated by selecting a more narrow mandibular anterior tooth mold. The posterior arch length discrepancy can be improved by eliminating the mandibular first premolar. By doing this one can come very close to a normal class I posterior tooth arrangement. The grinding of mandibular fossae mesiodistally is quite extensive with class II patients when a large horizontal distance between centric relation and the habitual functional area is present, to facilitate protrusive balance.

Class III jaw relationship (Prognathic): In this ridge relation mandible is comparatively larger than maxilla, resulting in end-to-end incisor relation, alongwith complications of posterior occlusion. This can be compensated by tilting maxillary teeth toward the palate, selecting a wider and shorter mandibular anterior tooth mold and addition of diastema distal to mandibular canine. For posterior cross arch width discrepancy, completely balanced but buccalized form of occlusion is required.

Special clinical situations using non-balanced (monoplane type) lingualized occlusion

This type of arrangement is indicated in several clinical situations including patients with resorbed or flabby ridges, patients who lack oral dexterity, who are not able to adjust to intricate occlusal patterns, and patients who receive immediate dentures where one desires an easy to adjust and adapt occlusal scheme.[7,8] For these patients esthetics and function can be achieved by utilizing a nonbalanced lingualized arrangement.

Arrangement: For non balanced lingualized occlusion scheme, the maxillary posterior tooth form should be an anatomic tooth with a large, blunt lingual cusp. The mandibular tooth is flat with large marginal ridge areas and very shallow grooves and sluice ways. The occlusal plane is set totally flat in a straight line. The maxillary teeth are arranged perpendicular to the occlusal plane. The lingual cusps are set to the center on mandibular tooth and often on marginal ridge. The buccal cusps are raised off the occlusal plane posteriorly. All the occlusal corrections are accomplished on the maxillary teeth.

To conclude, the lingualized occlusion concept maintain the advantages of both the anatomical teeth (i.e. aesthetic and chewing capacity) and the non-anatomical teeth (i.e. less horizontal forces), specifically in patients with special clinical situations. Ultimately, it can truly be stated that lingualized occlusion is the "occlusion for all situations".

Summary

The rewards of satisfaction and pride that come from providing quality denture treatment depend ultimately on how efficiently the dentist manages the problem of occlusion. The lingualized occlusion concept emerged as a valuable concept because of its adaptability to many different clinical situations. Lingualized occlusion has been advocated and promoted by many dentists over the past decades because of its simplicity and easy to apply approach. It can be achieved using a variety of tooth molds arranged in a number of ways that seem to provide the best suitable alternative to various occlusal rehabilitation situations. The different combinations of tooth molds available from one particular tooth manufacturer, and now tooth molds designed specifically for lingualized articulation by other manufacturer, allow the practitioner to improve the likelihood of maximal intercuspation, avoid deflective occlusal contacts, determined cusp height for selective occlusal reshaping, and achieve a natural and pleasing appearance.

References

1. Parr G.R. and Ivanhoe J.R. Lingualized occlusion, An occlusion for all reasons. Dent Clin North Am. 1996;40(1):103-112.
2. Kimoto S., Gunji A., Yamakawa A., Ajiro H., Kanno K., Shinomiya M., Kawai Y. Kawara M. and Kobayashi K. Prospective clinical trial comparing lingualized occlusion to bilateral balanced occlusion in complete dentures: A pilot study Int. J Prosthodont 2006;19(1):103–108.
3. Khamis M.M., Zaki H.S. and Rudy T.E. A comparison of the effect of different occlusal forms in mandibular implant overdentures. J Prosthet Dent. 1998;79(4):422-429.
4. Ohguri T., Kawano F., Ichikawa T. and Matsumoto N. Influence of occlusal scheme on the pressure distribution under a complete denture. Int J Prosthodont 1999;12:353-358.
5. Tarazi E., and Tzoutsky-Zadok N. Occlusal schemes of complete denturesa review of the literature Refuat Hapeh Vehashinayim 2007;24(1):56-64.
6. Lang BR. Complete denture occlusion. Dent Clin North Am. 2004;48:641-655.
7. Lang BR, Razzoog ME. A practical approach to restoring occlusion for edentulous patients. Part I: Guiding principles of tooth selection. J Prosthet Dent. 1983;50:455.
8. Lang BR, Razzoog ME. A practical approach to restoring occlusion for edentulous patients. Part II: Guiding principles of tooth selection. J Prosthet Dent. 1983;50:599.