## Single complete dentures

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Many patients become edentulous in one arch while retaining some or all of their natural teeth in the opposing arch. Several difficulties are encountered in providing a successful, single complete denture treatment. Regrettably, this service is envisioned as only half as difficult and time consuming as the construction of opposing complete dentures.

The purpose of this article is to discuss the various oral situations in which single complete dentures are indicated, and to specify the requirements such dentures must fulfill. A clinical procedure is described which aims at establishing a functional occlusion to restore and maintain the patient's oral health.

Single complete dentures may be opposed by: (1) natural teeth, (2) fixed restorations, (3) a removable partial denture, or (4) an existing complete denture. Each of these situations may present difficulties which must be recognized and thoroughly assessed before definitive treatment is begun.

### SINGLE COMPLETE DENTURE OPPOSED BY NATURAL TEETH

The natural teeth which will oppose a complete denture almost always require recontouring to some degree to provide for a harmonious occlusion. The reasons for this are: (1) the inclination of the occlusal plane is usually unfavorable, (2) the individual teeth may be malpositioned and may have assumed positions that present excessively steep cuspal inclinations, and (3) the buccolingual width of the natural teeth may be too wide. Failure to alter these conditions will often prevent the development of a bilateral balanced occlusion in eccentric positions. In

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several clinical situations, the arrangement of the anterior teeth to fulfill esthetic and phonetic requirements makes the development of balanced occlusion impossible in eccentric positions. However, bilateral balanced occlusion is most desirable for a complete denture in order to promote optimum stability.

*Complete upper denture opposing a complete dental arch of natural teeth.* The most common clinical situation involving a single denture is that of a complete upper denture and lower natural teeth. The occlusal plane is dictated by the lower teeth, and it usually has a series of unfavorable tooth inclinations due to elongation of teeth that have not had opposing contacts. These unfavorable inclinations will promote undesirable directions of force on the upper denture. Shunting type forces often result in the resorption of the bone underlying the denture or an inflammatory reaction of the basal seat tissues. The most common error in making a complete denture against lower natural teeth is the development of an occlusal arrangement without modification of the lower teeth.

Excessively steep inclinations of the occlusal plane or of individual teeth should be recognized and modified before the artificial teeth are arranged. The problems must be recognized during the treatment planning phase by the use of diagnostic casts accurately mounted on an adjustable articulator. An occlusion rim, a face bow transfer, and jaw relation records should be made. The articulator should be adjusted with eccentric jaw relation records. A preliminary arrangement of the artificial teeth will reveal the necessary changes to be made on the lower teeth. These charted corrections can be made in the mouth, and the "educated guess" of tooth modification can be eliminated.

*Complete lower denture opposing natural upper teeth.* A complete lower denture opposing upper natural teeth is contraindicated in most instances. A smaller basal seat area is available for the support of the lower denture than for an upper denture. Therefore, more stress per unit area will be applied to the lower residual ridge than to the upper residual ridge. The greater amount of stress per unit of area exerted through the natural upper teeth decreases the retention and stability of the lower denture. A rapid loss of supporting bone from the mandible and continual soreness are often observed as a result of such a combination and it should be avoided if possible. There are, however, some situations in which the construction of a lower denture against natural teeth is necessary. Health factors that prohibit the removal of teeth may justify this procedure.

*Complete lower denture opposing an upper removable partial denture.* The clinical indications are generally the same as described for complete lower dentures opposing upper natural teeth. The few advantages of retaining the natural teeth are outweighed by the disadvantages of having the lower ridge destroyed.

## SINGLE COMPLETE DENTURE OPPOSING FIXED RESTORATION

Once a fixed restoration is placed in a dental arch, the restored arch can be thought of as natural teeth opposing a complete denture. The construction and placement of fixed restorations can correct many occlusal disharmonies that may have existed previously. The occlusion between the denture teeth and the fixed restorations is harmonized on an articulator while the patterns for the castings are being developed.

**Fig. 1.** A cantilever-type fixed partial denture has been placed opposing a maxillary complete denture. The two premolars have been splinted together. The addition of this cantilever tooth provides occlusion through the first molar on both sides, thereby eliminating the need for a removable partial denture. The reduced biting force from the maxillary denture allows the cantilevered abutment tooth to function without clinical damage.

## SINGLE COMPLETE DENTURES OPPOSING REMOVABLE PARTIAL DENTURES

The most common single denture situation is that of an edentulous upper arch opposing some remaining lower natural teeth. Replacement of missing posterior teeth in the lower arch will almost always improve the prognosis for the upper denture. However, a removable partial denture is not always indicated to oppose the complete denture even when some or all of the molars are missing.

Sharry[1] states that in a Class II jaw relationship a complete upper denture often may be constructed against lower anterior teeth and the premolars without replacing the molars. In this situation, the lower premolars are far enough posterior in relation to the maxillary residual ridge that the forces of occlusion are directed to the middle-posterior part of the upper denture. If this same patient presented a similar condition but in a Class III jaw relation, the clinical situation would be different because the mandibular premolars would apply occlusal forces against the anterior part of the maxillary residual ridge.

A complete upper denture should not be constructed to oppose only 6 or 8 lower natural anterior teeth unless the missing posterior teeth are replaced with a removable partial denture. Many patients tolerate this condition by developing tongue habits to retain the denture. The clinical result usually shows a loss of bone accompanied by formation of large amounts of hyperplastic tissue in the anterior part of the maxillary ridge.

A lower removable partial denture is usually indicated in all situations when all molars are missing. However, if all teeth through the first molars remain, a removable partial may not be necessary. If all teeth through the premolars on one side and the first molar on the other side remain, a removable partial denture may not be necessary. In this situation, the missing molar may be restored in

*Fig. 2*

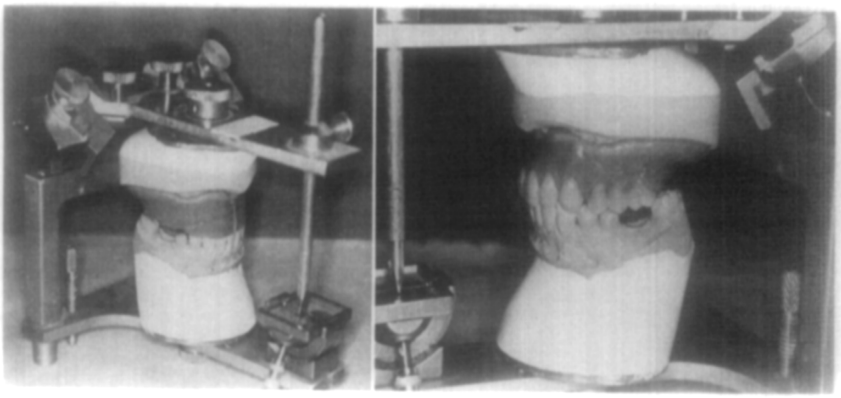

*Fig. 2*

**Fig. 2.** The properly contoured occlusion rim is mounted on an articulator at the correct vertical dimension of occlusion.

**Fig. 3.** The teeth are selected and arranged in occlusion. The anterior teeth are provisionally arranged for esthetics. The posterior teeth are arranged in centric occlusion. The trial denture is placed in the mouth, the appearance is evaluated, and the centric relation and vertical relation are vertified.

selected instances, with a cantilever type of fixed partial denture having at least two and preferably three abutments (Fig. 1).

## SINGLE COMPLETE DENTURE OPPOSING AN EXISTING DENTURE

No new complete denture should be made to oppose an existing single denture unless the existing denture meets certain minimum standards. The teeth of the existing denture should (1) be aligned with regards to the residual ridge of its basal seat for mechanical stability and masticatory efficiency, (2) have a good appearance, (3) exhibit proper tissue support, and (4) have a cusp height suitable for the teeth of the planned denture. The denture base should (1) have an esthetic contour and thickness to adequately support the perioral structures, (2) be extended to utilize all available supporting tissues, and (3) be stable and retentive. Unfortunately, few existing dentures against which new dentures are to be constructed fulfill all these criteria. Much of denture retention and stability are affected by the placement and occlusion of the teeth. Since the dentist assumes the responsibility for *both* dentures when he accepts a patient demanding the construction of a new denture opposed by an existing denture, the prognosis is poor, and the risk is great.

## CLINICAL PROCEDURES FOR MAKING A COMPLETE UPPER DENTURE OPPOSING NATURAL TEETH OR FIXED RESTORATIONS

Make an impression of the lower natural teeth in an irreversible hydrocolloid impression material and pour an artificial stone diagnostic cast.

Make a preliminary, border molded upper modeling compound impression (for immediate dentures use an irreversible hydrocolloid) and construct an individual impression tray of cold-curing acrylic resin.

Make the final impression in the resin tray and make an artificial stone cast in this impression.

*Fig. 4*

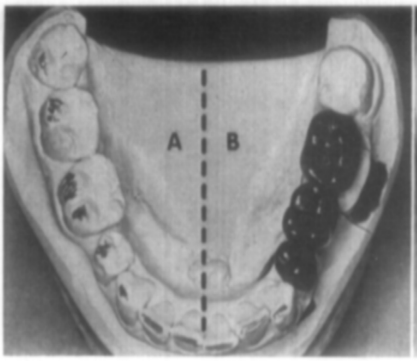


*Fig. 5*

**Fig. 4.** *(A)* The stone teeth are altered as necessary to aid in the establishment of a harmonious occlusion. The modified areas are marked so the same alterations can be accomplished on the natural teeth. *(B)* The wax patterns are carved to conform to the existing occlusion of the maxillary denture. The wax patterns are cast and placed in the mouth. A final lower cast is then made after all tooth preparations on the lower arch have been completed.

**Fig. 5.** The lower opposing teeth have been poured in low-fusing metal. This provides a more stable occlusal table and prevents chipping and abrasion of the teeth which might occur on a stone cast.

Construct an occlusion rim on the maxillary cast, and contour it for adequate lip support. Then use a face bow registration to mount the maxillary cast on the articulator.

Establish the vertical dimension of occlusion and contour the maxillary occlusion rim in the anterior region to simulate the vertical and horizontal overlap of the anterior teeth. The anterior region of the occlusion rim should have the same thickness as the incisal edges of the anterior teeth to allow for this vertical overlap (Fig. 2).

Make a preliminary centric relation record. Reduce the vertical height of the maxillary occlusion rim 2 mm. so that the centric relation record can be made at the desired vertical dimension of occlusion. Use a quick-setting plaster for making this interocclusal record of centric relation.

Select the artificial teeth and arrange them in centric occlusion so that the centric relation records can be verified. Arrange the anterior teeth provisionally for esthetics (Fig. 3).

Make the eccentric relation records in plaster or wax, and adjust the condylar elements of the articulator. Rearrange the posterior teeth to satisfy the requirements of balanced occlusion. Make as many adjustments as possible on the denture teeth in preference to making the changes on the natural teeth.

Alter the occlusal surfaces of the teeth on the stone cast as necessary to provide a balanced occlusion. The recontoured surfaces are outlined on the cast. These marks serve as a guide to making the same changes on the natural teeth in the mouth (Fig. 4).

After the teeth have been recontoured in the mouth, make an impression of the lower dental arch in irreversible hydrocolloid. Pour low fusing metal into the occlusal surfaces of the impression. Before the metal has hardened, place pieces of

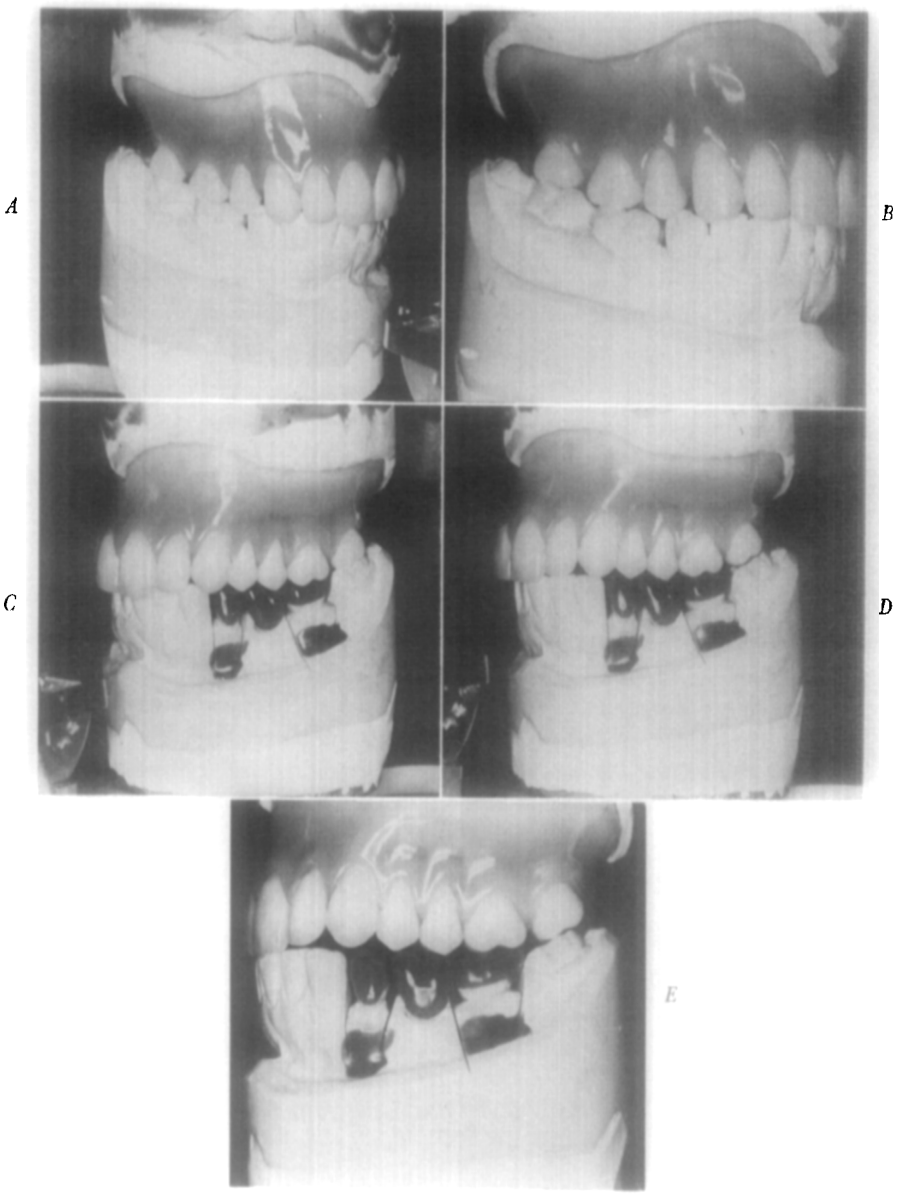


**Fig. 6.** The artificial teeth of the maxillary complete denture have been arranged in a harmonious relation with the modified mandibular natural teeth. *(A)* The artificial teeth are in centric occlusion opposing the modified natural teeth. *(B)* The teeth are in a right lateral working position. *(C)* The artificial teeth are in centric occlusion opposing the wax patterns for a fixed partial denture. *(D)* The artificial teeth are in a left lateral working position opposing the wax patterns of a fixed partial denture. *(E)* The teeth are in a protrusive position.

paper clips in the metal to aid in the retention of the metal to the artificial stone base that is poured into the remaining part of the impressions (Fig. 5).

If gold restorations are required for abutments for a removable partial denture, fixed partial denture, or single crown, the preparations are made in the mouth.

Make an impression of the preparations and of the occlusal corrections, and pour a cast. Mount this cast on the articulator and carve the wax patterns to the existing occlusion of the denture teeth (Fig. 6). Place the gold restorations in the mouth, and make a final impression of the completed lower dental arch in irreversible hydrocolloid. Then pour the cast in stone.

Make a new centric relation record and remount the lower cast. Modify the anterior teeth to achieve the best esthetic result.

The teeth are arranged in the most nearly ideal balanced occlusion that is possible. Perfectly balanced occlusion in all eccentric positions may not be possible for every patient when working with the natural teeth. Esthetic requirements may dictate positions of the anterior teeth that will prevent a perfect, linear balanced occlusion. However, the centric occlusion must always be in harmony with centric relation.

Complete the denture in the usual manner and preserve the face bow transfer. Make a new centric relation record, remount the lower cast, and correct the occlusion on the articulator. The horizontal and lateral condylar inclinations previously determined are acceptable to permit the adjustment of the articulator provided the same articulator is used.

## SUMMARY

The development of a harmonious occlusion is most critical to the success of a single complete denture treatment. Achieving this desirable characteristic is usually much more difficult than arranging artificial teeth for opposing complete dentures.

Various oral situations were discussed in which single complete dentures are indicated, and a clinical procedure for treating patients who are edentulous in one arch are described.

## Reference

1. Sharry, J. J.: Complete Denture Prosthodontics, ed. 2, New York, 1968. McGraw-Hill Book Company, Inc., pp. 299-315.

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