

An Accurate Interocclusal Record By Creating A Vertical Stop

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Accurate interocclusal registrations are an integral part of prosthetic rehabilitation. The success of rehabilitation treatment is closely related to an exact reproduction of occlusal relation in the articulator during all stages of treatment. This article describes a method of making an accurate interocclusal record when the most distal tooth is an abutment of a fixed partial denture. In this method a centric stop or vertical stop is prepared to maintain the vertical dimension of occlusion and to act as third point of reference for a stable occlusal relationship when occluding the definitive casts on articulators.

INTRODUCTION

Complicated and sophisticated articulators do not produce accurate interarch relationships, but accurate interocclusal records can do the same. An accurate interocclusal record is an important part of fabricated fixed partial dentures, particularly when the distal abutment is the last tooth in the dental arch. Small errors in relating the working casts cause many frustrations with occlusal adjustment, which results in altering the occlusal anatomy and occasionally ruining an acceptable prosthesis.

When the restoration involved terminal teeth, then an interocclusal record is necessary as there usually is insufficient stability of the casts for hand articulation and mounting. Several recording mediums are used for interocclusal record.

Ideal requirements of interocclusal recording materials are

1. Have reproductive accuracy.
2. Should be easy to handle.
3. Have a fair degree of hardness when set.
4. Should be rigid when set.
5. Should be of no resistance to closure during the registration.

Interocclusal recording materials used are

1. Base plate wax
2. Plaster of Paris
3. Zinc oxide eugenol paste
4. Rubber base and silicone materials
5. Acrylic resin

Despite the number of recording materials available still few problems exists in transferring the working casts to the articulator

1. Incomplete seating of the cast into the interocclusal record.
2. Improper condylar position because of loss of proprioception.
3. The instability of recording materials.

This article describes methods used for registering accurate interocclusal records by creating a vertical stop on the enamel of the abutment or made of composite or a metal core covered with composite when the most distal teeth is abutment. After the cast is mounted in the articulator the cone is removed. [Figure 1]

Procedure

Vertical cone preparation on a natural teeth abutment:

1. Isolate the abutment to keep it dry. After etching apply a small amount of bonding agent to the surface of the main cusp of the abutment.
2. Lubricate the opposing tooth with a thin coating of separating medium. Apply a small amount of composite to the abutment & have the patient close in maximal intercuspation. Allow the composite to set.
3. Use articulating paper to identify the vertical stop.
4. With a bur or a diamond rotary instrument prepare the abutment leaving a slightly tapered cone. [Figure 2, A]
5. Round the Sharp tip of the cone slightly by polishing with a white mounted stop. [Figure 2, B]
6. Make the final impression & do not allow the tray to contact the cone.

7. Make & then place the provisional restoration. Be certain to leave an opening for the cone. Dismiss the patient.
8. Pour the final impression.
9. Mount the definitive cast in the articulator using the cone as a third point of reference for a stable occlusal relationship when occluding the definitive cast with the opposite cast.
10. Remove the cone from the cast, maintaining the

contour of the occlusal surface of the preparation and fabricate the prosthesis.

11. At the next appointment remove the provisional restoration and clean the surface of the abutment.
12. Remove the cone from the abutment in the mouth.
13. Insert the final prosthesis.

Metal-reinforced cone on an endodontically treated abutment

In a root canal treated tooth since there is no enamel remaining an alternative cone can be constructed as follows

1. Fabricate a metal core with a projection opposing the fossa. The projection need not contact the opposing tooth but should have an undercut for retention of the composite. [Figure 3A]
2. Cement the metal core into the abutment.
3. After the removal of excess cement, pack composite around the projection and let it set. [Figure 3B]
4. Prepare the composite into a cone shape and dull the sharp point slightly. [Figure 3C]
5. Follow the procedure described above for the natural tooth abutment. [7-13]

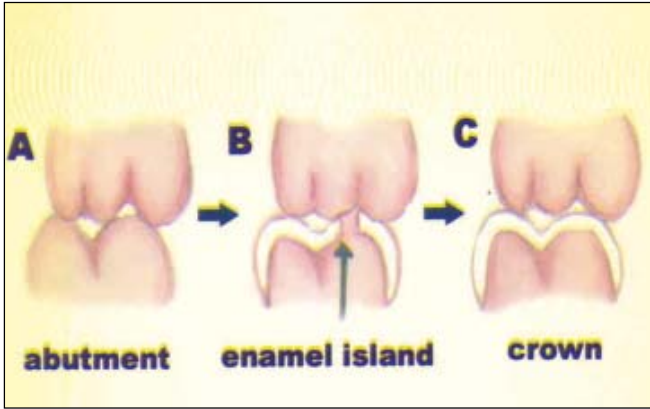


Figure 1: Enamel island (cone) method. A, Before preparation. B, Preserved enamel island or cone. C, Removed enamel cone before cementing crown.

Composite cone on previously prepared abutment

If a prepared tooth needs to be used as an abutment,

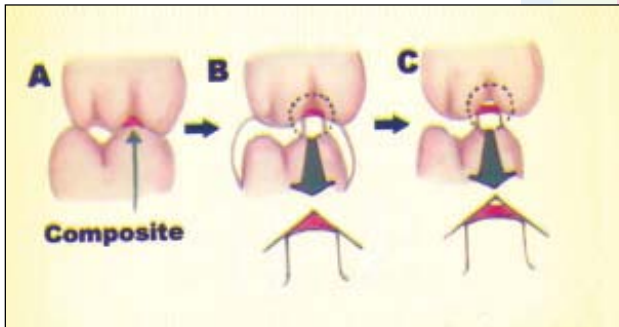


Figure 2: Cone preparation in enamel of natural abutment. A, Composite build up on functional cusp. B, Preparation living slightly tapered cone topped with composite. C, Enamel cone with blunted composite point.

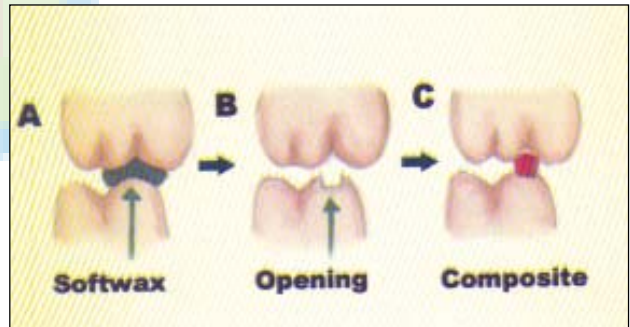


Figure 4: All composite cone on abutment with no enamel. A, Soft wax placed to locate the cone. B, Small opening prepared. C, Opening filled with composite and sharp cone removed.

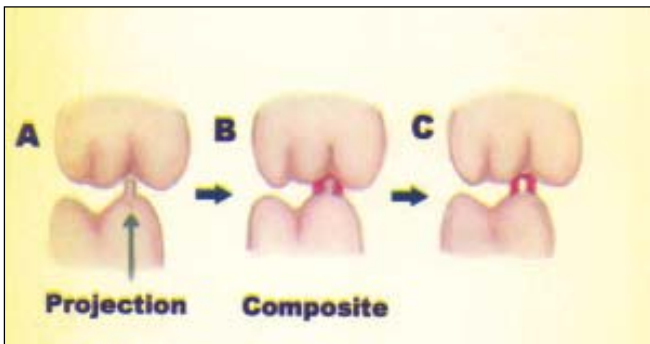


Figure 3: Endodontically treated abutment to make new metal core. A, Metal core with projection. B, Composite packed around projection. C, Sharp point of cone is blunted.

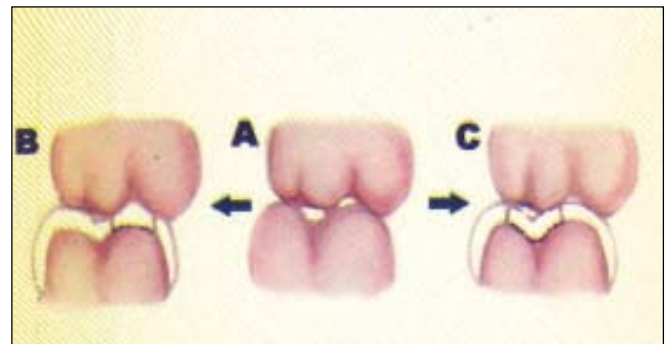


Figure 5: Wide island (cone) to achieve stability. A, Before preparation. B, Wide cone opposing fossa. C, Wide cone opposing cusp.





there is no enamel remaining and no way to create a projection. A composite cone can be fabricated as follows:

1. Place a soft wax on the functional cusp of the abutment to determine the location of the cone. [Figure 4A]
2. Prepare a small opening of about 1.5mm with an inverted cone bur in the abutments surface where the cone is planned. [Figure 4B]
3. After application of a small amount of bonding agent fill the opening in the abutments with composite and build it up to touch the opposing occlusion in centric relation. Let the material set.
4. Prepare the cone and make the sharp point of the composite dull. [Figure 4C]
5. Follow the procedure previously described for the natural abutments.^[7-13]

Limitations

1. The abutment must be a natural tooth.
2. An enamel cone containing an oblique plane may cause instability of the vertical stop, which may result in an inaccurate interocclusal relationship.
3. Creation of a wide island (cone) to achieve stability requires a large volume of enamel to be removed which may result in inaccuracy of the prepared occlusal surface. [Figure 5]

DISCUSSION

Recording mediums used conventionally exist few problems in transferring the working cast to the articulator like incomplete seating of the cast into the interocclusal record improper condyle position because of loss of proprioception and dimensional instability of recording materials. The procedures described here

used the enamel island (cones) as a third point of reference to make a stable occlusal relationship when occluding the definitive casts on articulators.

It helps to achieve a precise interocclusal record by creating a vertical stop or enamel island (cone) on the most distal abutment. Enamel of the abutment, composite, metal core are used to create vertical stop ensures the stability of the casts because of its slender shape. Also it can be removed easily. However the slender cone with sharp point can break easily. Therefore the blunting of the sharp point before making impression should be done. Few limitations are there like abutment must be a natural tooth also creation of a wide island to achieve stability requires a large volume of enamel to be removed which may result in inaccuracy of the prepared occlusal surface.

SUMMARY

This article describes a procedure for making an accurate interocclusal record when the most distal tooth is an abutment for a fixed partial denture. This procedure also reduces the possibility of dimensional changes and inaccurate cast relationship often observed with conventional materials.

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