Duplicating the Posterior Extension of an Existing Denture

Authored by Won-suk Oh, DDS, MS, and Ju-mi Park, DDS, MS, PhD

Upon successful completion of this CE activity 1 CE credit hour will be awarded.
Duplicating the Posterior Extension of an Existing Denture

Effective Date: 9/1/2013  Expiration Date: 9/1/2016

ABOUT THE AUTHORS

Dr. Oh is a clinical associate professor at the University of Michigan School of Dentistry, is a Diplomate of American Board of Prosthodontics, and is a Fellow of the American College of Prosthodontists. Dr. Oh teaches multiple courses as a course director and participates in continuing education courses on removable prosthodontics. He has research interest in prosthodontics and dental materials. He can be reached at ohws@umich.edu.

Disclosure: Dr. Oh reports no disclosures.

Dr. Park is a professor and assistant dean at the Chonbuk National University School of Dentistry, and a Diplomate of Korean Board of Prosthodontics as a board certified prosthodontist. Dr. Park serves as a course director for multiple courses on removable prosthodontics for predoctoral and graduate students. She is active with continuing education courses and research on removable prosthodontics, dental ceramics, color, and dental implants. She can be reached at jmpark@chonbuk.ac.kr.

Disclosure: Dr. Park reports no disclosures.

INTRODUCTION

The posterior extension of a maxillary complete denture (CD) should accommodate the patient’s physiologic and neuromuscular function of the tongue and the palate while ensuring the retention of the prosthesis. To comply with the patient’s function, the posterior end of the denture base commonly presents a sunken and rolled border of a bead- or butterfly-shaped postpalatal seal, along the vibrating line of the soft palate.

A record base is a useful device in transferring the intraoral landmark “vibrating line” to the cast, although a post dam can be established physiologically when making an impression. This recording device fabricated on the master cast is carried intraorally to pick up the indelible pencil mark of the vibrating line and trimmed to indicate a desired posterior extension of a maxillary CD. A post dam is carved on the cast with a variety of shapes and dimensions to conform to the configuration and physiologic movement of the palate. However, this method requires a record base to transfer the vibrating line to the cast, and the functions of the postpalatal seal cannot be tested in the mouth.

An acrylic base CD is adjustable, including a postpalatal seal; however, the denture often experiences a fracture along the midline, in particular when opposing against the natural dentition. Although an acrylic base can be reinforced using a wire, sectional metal framework, or woven form of glass-fiber, a metal base covering the palate of denture foundation ensures the structural durability of the denture and keeps the corresponding mucosa healthy. However, the metal base cannot be adjusted along the posterior extension when indicated.

This article will describe a simple and accurate method of duplicating the posterior extension of an existing CD, to indicate the posterior extension of a metal base for a new CD, using a silicone duplicate index. The silicone duplicate index is processed using a silicone bite registration material against a silicone cast for the existing denture and trimmed along the representation of the denture border. This index is resilient and overcomes the undercuts in the stone cast to transfer the location of posterior extension of the existing denture. This method is simple and precise in formulating a post dam for a metal base, eliminating the necessity of record base to transfer the vibrating line to the cast.

CLINICAL TECHNIQUE

Evaluate the fracture pattern and the adequacy of the postpalatal seal of an existing maxillary acrylic base CD opposing against the natural dentition (Figure 1). Repair the
broken CD with an acrylic resin (Jet Denture Repair Acrylic [Lang Dental Manufacturing Company]) with the aid of a silicone cast of vinyl polysiloxane (VPS) impression material (Aquasil Universal [DENTSPLY Caulk]) (Figure 2a). Set aside the cast for duplicating procedure of the posterior base extension of the existing denture. Coat the cast with a thin layer of petroleum jelly (Vaseline [Unilever]) and inject a silicone bite registration material (Blue Bite HP [Henry Schein]) on the intaglio surface of the denture. Seat the denture against the cast so that an excess silicone material extrudes along the border of the denture (Figure 2b). Do not disturb the setting of the silicone material interposed between the cast and the denture. Separate the denture from the cast to isolate the processed silicone material. Trim the excess material along the imprint of the denture border with a surgical blade (carbon steel surgical blade No. 25 [Integra Miltex]) (Figure 2c) to generate a silicone duplicate index of a posterior denture base extension. Make a final impression of the edentulous maxillary arch with a VPS impression material (Aquasil LV [DENTSPLY Caulk]) using a border molded custom tray and generate a master cast in Type IV dental stone (Silky Rock [Whip Mix]) for a maxillary metal base conventional CD. Seat the small-diameter implant on the trimmed master cast to indicate the posterior base extension of the existing denture (Figure 2d). Mark the posterior end of the index and carve a post dam on the cast as indicated by the silicone duplicate index with a round bur (US No. 6 [Brasseler USA]) and a wax spatula (7 Wax [Hu-Friedy]) to duplicate the posterior extension of the existing denture for the fabrication of metal base for a new maxillary CD (Figures 3a to 3c).

**DISCUSSION**

The denture base extension is established by means of a border molding when making a final impression for a maxillary CD.

**Figure 1.** Midline fracture of maxillary acrylic base complete denture (CD) opposing against natural dentition.

However, the posterior extension of the denture base should be determined to be compatible with the neuromuscular function of the soft palate and the tongue. The use of a record base is the most common method of transferring the vibrating line to the cast indicating the posterior extension of the denture base. This procedure can be carried out when registering the maxillomandibular relationship record or evaluating the
teeth alignment intraorally. A post dam is formulated (along the line indicated) by means of the record base, where the posterior extension of the acrylic base for a maxillary CD can be adjusted, when indicated.

A master cast for a metal base CD does not require a mounting procedure prior to obtaining a cast of the metal base when the patient presents a sufficient interarch distance. The metal base is tried-in and fitted in the mouth, and used as a recording device for the registration of the maxillomandibular relationship. However, this method requires a precise measurement for the location of the postpalatal seal, given the incapacity of the metal base to be adjusted, in particular for the posterior extension of the base. Meanwhile, an existing denture serves as a reference for the design of a new denture. The prosthesis can be tested intraorally for the adequacy of the postpalatal seal, including the posterior extension of the base.

A maxillary CD of an acrylic base is rigid and cannot seat on the corresponding stone cast of the edentulous maxillary arch demonstrating undercuts. A silicone bite registration material presents a dimensional stability and resiliency to overcome the undercuts on the cast. The silicone duplicate index is a replica of the extension of the existing denture and seats on the master cast for a new CD to indicate the posterior extension of the denture tested and proved in the mouth. This duplication procedure is simple and predictable in maintaining the postpalatal seal and in avoiding the gag reflex.

**CONCLUSION**

A maxillary metal base CD exhibits rigidity; however, it is very difficult to adjust; in particular, in the posterior extension of the base. This method of duplicating the posterior extension of an existing denture proven in the mouth is simple, while ensuring an adequate postpalatal seal of a metal-based complete denture.

*Figures 3a to 3c. Metal base maxillary CD, duplicating posterior extension of existing CD. (a) Metal base cast in chrome-cobalt alloy. (b) Metal base CD processed in acrylic resin. (c) Anterior display of teeth in smile.*
REFERENCES


POST EXAMINATION INFORMATION

To receive continuing education credit for participation in this educational activity you must complete the program post examination and answer 4 out of 5 questions correctly.

Traditional Completion Option:
You may fax or mail your answers with payment to Dentistry Today (see Traditional Completion Information on following page). All information requested must be provided in order to process the program for credit. Be sure to complete your “Payment,” “Personal Certification Information,” “Answers,” and “Evaluation” forms. Your exam will be graded within 72 hours of receipt. Upon successful completion of the post-exam (answer 4 out of 5 questions correctly), a letter of completion will be mailed to the address provided.

Online Completion Option:
Use this page to review the questions and mark your answers. Return to dentalcetoday.com and sign in. If you have not previously purchased the program, select it from the “Online Courses” listing and complete the online purchase process. Once purchased the program will be added to your User History page where a Take Exam link will be provided directly across from the program title. Select the Take Exam link, complete all the program questions and Submit your answers. An immediate grade report will be provided. Upon receiving a passing grade, complete the online evaluation form. Upon submitting the form, your Letter Of Completion will be provided immediately for printing.

General Program Information:
Online users may log in to dentalcetoday.com any time in the future to access previously purchased programs and view or print letters of completion and results.

POST EXAMINATION QUESTIONS

1. The posterior extension of a maxillary complete denture (CD) should accommodate the patient’s physiologic and neuromuscular function of the tongue and the palate while ensuring the retention of the prosthesis.
   a. True    b. False

2. A record base is a useful device in transferring the intraoral landmark “vibrating line” to the cast, although a post dam can be established physiologically when making an impression.
   a. True    b. False

3. An acrylic base CD is adjustable, including a postpalatal seal; however, the denture often experiences a fracture along the midline, in particular when opposing against the natural dentition.
   a. True    b. False

4. This method is complex and time-consuming, but it is precise in formulating a post dam for a metal base, eliminating the necessity of record base to transfer the vibrating line to the cast.
   a. True    b. False

5. A silicone bite registration material presents a dimensional stability and resiliency to overcome the undercuts on the cast.
   a. True    b. False

This CE activity was not developed in accordance with AGD PACE or ADA CERP Standards. CEUs for this activity will not be accepted by the AGD for MAGD/FAGD credit.
If you wish to purchase and complete this activity traditionally (mail or fax) rather than online, you must provide the information requested below. Please be sure to select your answers carefully and complete the evaluation information. To receive credit you must answer 4 of the 5 questions correctly.

Complete online at: dentalcetoday.com

Mail or fax this completed form with payment to:

Dentistry Today
Department of Continuing Education
100 Passaic Avenue
Fairfield, NJ 07004
Fax: 973-882-3622

Examination Fee: $20.00  Credit Hours: 1

Note: There is a $10 surcharge to process a check drawn on any bank other than a US bank. Should you have additional questions, please contact us at (973) 882-4700.

☐ I have enclosed a check or money order.  ☐ I am using a credit card.

My Credit Card information is provided below.

☐ American Express  ☐ Visa  ☐ MC  ☐ Discover

Please provide the following (please print clearly):

Exact Name on Credit Card

/  

Credit Card #  Expiration Date

Signature

This CE activity was not developed in accordance with AGD PACE or ADA CERP Standards. CEUs for this activity will not be accepted by the AGD for MAGD/FAGD credit.