ALTERED (CORRECTED) CAST

The distal extension removable partial denture is supported by the rests of the metal framework on the abutment teeth and by the denture base on the soft tissue of the edentulous ridge. Factors that influence support by the abutment teeth include the number, location, and adequacy of preparation of the rest seats, and the fit of the metal framework. Factors that influence support by the soft tissue include extension, contour, and adaptation of the denture base to the distal extension area.

The altered cast (a.k.a. corrected cast) is a method whereby a better fit of the distal extension resin denture base is achieved and consequently better support by the soft tissues. It is a procedure normally restricted to mandibular RPD's. The technique involves making an additional impression of the distal extension area(s) and replacement of this section(s) of the master cast.

Since this laboratory exercise is a simulation of a clinical procedure, the technique must be modified somewhat from actual procedures; e.g. there is no way to simulate border molding to gain proper extension of the tray.

A. Exercise.

The clinical technique involves the following steps:

1. intraoral fit of the framework to the abutment teeth;
2. fabricate an impression tray for distal extension area;
3. border mold the tray by physiologic movements of the patient;
4. make the altered cast impression of the patient;
5. cut away distal extension area of master cast;
6. seat framework with impression on master cast;
7. bead and box impression;
8. pour new distal extension area.

The laboratory exercise involves the following steps:

1. laboratory fit of the framework to the "patient" cast;
2. fabricate an impression tray for distal extension area;
3. border mold the tray by manual adaptation to "patient" cast;
4. make the altered cast impression of "patient" cast;
5. cut away distal extension area of master cast;
6. seat framework with impression on master cast;
7. bead and box impression;
8. pour new distal extension area.

B. Procedures

1. Fit the framework.

Almost all frameworks require some adjustment (p. 36). In this laboratory exercise, each student will be issued a framework on a "master" cast. Fitting will be accomplished by lightly trimming the "patient" cast until the rests are fully seated, and the framework can be placed and removed from the cast without difficulty. The tissue stop should contact the cast. Seek instructor assistance if necessary.

2. Fabricate the impression tray.

The resin tray is fabricated on the master cast by any one of the commonly used methods: "dough" (tray material), "salt & pepper" (repair resin), or "light-cure" (Triad™). It is attached to the retention lattice of the framework by the following method:
a. block out undercuts (probably not necessary on the "master" cast);

b. "wet" and then lubricate ("Alcote") the cast;

c. fabricate the tray with "light-cure" resin; seat the framework, then apply the resin;

d. extend the tray to cover the entire edentulous area (peripheral roll, retromolar pad); afterward, trim it 2-3 mm. short of the peripheral landmarks (same as complete dentures);

e. extend the tray anteriorly to the finish line (lingual) and the posterior abutment (facial);

f. viewed from the tissue side, no resin must cover the metal tissue stop (if it contacted the cast originally).

CAUTION: the metal framework must be fully seated in the occlusal rest seats at all times, while fabricating the tray, making the impression, and pouring the cast.


The objectives of border molding for a removable partial denture are the same as for a complete denture, maximum physiologic extension for maximum support. Even though the clinical procedure is also exactly the same, it will be accomplished in this laboratory exercise in the same manner as in the complete denture laboratory.

a. properly fabricated resin tray;

b. "wet" & lubricate the "patient" cast;

c. apply green stick compound to the tray a section at a time, making certain the framework remains fully seated;

d. after border molding is finished, remove compound that intrudes on the tissue surface and covers the "land area" of the cast;

4. Impression.

The impression can be made in a variety of different materials: polysulfide or polyvinyl rubbers, metallic oxides, mouth-temperature waxes, tissue-conditioning materials. It is imperative that the material be free flowing to avoid undue pressure on the residual tissues. Polysulfide rubber is used for this exercise to minimize expense.

a. lightly relieve the tissue side of the tray to provide room for the impression material;

b. apply tray adhesive;

c. "wet" & lubricate the "patient" cast;

d. make the impression in the same manner as for complete dentures, taking care to assure that the framework remains fully seated;

e. remove and inspect the impression; it must possess accurate detail and the absence of voids; there should be no "show-through" of the impression tray or compound; there must be no impression material under rests;

f. excess impression material that has covered the "land area" of the cast or "bled" onto areas anterior to the finish line or posterior abutment should be trimmed with scissors or a red-handle knife.
5. **Prepare the "master" cast.**

The impression was made on the "patient" cast. The "master" cast is the one to be altered by cutting away the distal extension area and pouring a new cast for this section.

a. draw a line just distal to the abutment tooth extending through the peripheral roll (facial) and just past the vestibule (lingual); extend the line straight posteriorly to the end of the cast (see illustrations);

b. cut away this section by using a saw and discard it;

c. cut deep vertical and horizontal grooves in the exposed cut surfaces of the cast to provide retention for the new section to be poured (see illustrations and models);

d. seat the framework with the impression on the "master" cast that has been sectioned; the rests must be fully seated and **no part of the impression must touch the cast;**

e. the framework must be stable, if necessary use sticky wax over the lingual bar.

6. **Pour the new cast section.**

a. bead and box the impression in the normal manner, taking special precaution to maintain a peripheral roll (it is not necessary to box the entire cast);

b. seal the wax water-tight to cast and tray;

c. "wet" the cast to assure a secure junction with the new stone;

d. pour the new cast section with vacuum-mixed stone;

e. after the stone has set, separate framework and impression from cast, and trim the cast taking care to retain the peripheral roll and land area.

7. **Remove impression and tray from framework.**

a. remove impression material from tray;

b. carefully remove the tray from the framework; soften the resin by lightly heating it over a Bunsen burner and pulling it away from the framework; do not allow the resin to flame-up since that will discolor the metal framework and require re-polishing.

8. **Place framework on the altered "master" cast.**

a. replace the framework on the altered cast to exam the fit; frequently there is a space between the metal tissue stop of the framework and the surface of the altered cast;

b. if there is space between the tissue stop and the cast, a new tissue stop is made by adding auto-polymerizing resin under the framework; this is required to support the distal extension portion of the framework during packing and processing the resin denture base; if a new tissue stop is not made, distortion of the framework is likely.

**Place orientation grooves in the base of the cast**

References: illustrations (p. 44) learning modules
Fig. 33 Procedures for the altered cast technique.

A. framework on master cast.
B. framework and impression tray.
C. dotted line showing section of cast to remove.
D. section of cast removed and retention grooves.
E. framework, tray and impression seated on master cast.
6. Remove the mandibular "patient" cast from the articulator and relate the altered "master" cast to the opposing maxillary cast (special care must be taken to prevent opposing "land" areas or tuberosities / retromolar pads from contacting).

7. "Wet" the altered "master" cast with slurry water and install it in the articulator (orientation grooves should be placed on the base of the cast).

**Special note:** it is **impossible to remove** an acrylic resin record base from under the framework of a RPD once it has been flasked for polymerization of the denture base. Therefore, it is recommended that the base **be removed** immediately following installation of the casts and **before arrangement** of the prosthetic teeth for the wax try-in.

8. After the record base and wax occlusion rim have been removed, the adaptation of the "metal tissue stop" to the surface of the altered cast must be appraised once again. If the tissue stop does not contact the cast, an "auto-polymerizing resin tissue stop" must be attached to the retention lattice of the framework (p. 43).

The purpose of the tissue stop is to support the framework distal extension during packing and processing of the denture base. Without a tissue stop, the pressures created in the denture flask during this process might easily result in displacement or distortion of the framework.

9. After the altered "master" cast has been installed in the articulator, arrangement of the prosthetic teeth may begin.

4. **Tooth Arrangement.**

Selection of the occlusal scheme and prosthetic teeth has been determined prior to the time that this laboratory phase is begun (p. 45). However, study of the articulated casts sometimes provides information not previously observed and changes from the original plan are sometimes required.

In any event, restrictions of space and the requirements of the opposing occlusion often complicate the arrangement of prosthetic teeth for removable partial dentures. Alteration of the occlusal and proximal surfaces, or the collar of the prosthetic teeth by selective grinding is nearly always necessary. In some instances, even the metal framework must be altered to accommodate the prosthetic teeth, but **not** in this laboratory exercise.

The prosthetic teeth must be arranged to fulfill esthetic demands and so a pleasing facial contour is of paramount importance. The facial cusp height and occlusogingival length of each individual tooth must be in concert with the adjacent and opposing dentition. In all instances, the patient has the final word in the esthetic arrangement of the prosthetic teeth.

Equally important, the arrangement must fulfill functional requirements. So, the horizontal placement of the occlusal plane must overlay the underlying alveolar ridge (survey lines) and the vertical relation must be level with the dorsum of the tongue whenever the remaining natural teeth do not dictate otherwise.


2. After removing the metal framework, one layer of soft baseplate wax is adapted to the distal extension area of the master cast. The retention lattice of the framework is gently heated over the Bunsen burner and the framework firmly re-seated on the cast. Another layer of baseplate wax over is adapted over the retention lattice.

   **Chill the wax.** Check to be certain the framework and wax base can be removed from cast.
6. Remove the mandibular "patient" cast from the articulator and relate the altered "master" cast to the opposing maxillary cast (special care must be taken to prevent opposing "land" areas or tuberosities / retromolar pads from contacting).

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