

Prosthetic Complete denture



Lec 19

Repair, Relining and Rebase

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Denture repair and duplication

- Probably the most common denture fractures are those along the mandibular and maxillary midline.
- Complete denture occasionally breaks when in function, or when dropped on a hard surface.
- The key of repair of all fractured denture is the accurate reassembly of the broken parts.
- Denture repair, relining, rebasing is called maintenance of denture

Denture fracture

1. Midline fracture
2. Broken tooth :
 - Anterior tooth
 - Posterior tooth
3. Any part fracture :
 - Presence of broken part
 - Absence of broken part

Midline fracture (intra-oral)

➤ Cause of midline fracture:

A. Denture factor :

- 1) Poor fit denture : when ridge resorption occur and denture supported only by hard palate -----denture flexure by occlusion around fulcrum (median palatine raphe), must make relining or rebasing after repair to prevent repeated fracture
- 2) Lack of adequate relief : compressible mucosa covering ridge in the same time median palatine raphe not properly relieved ----- denture flexure by occlusion
- 3) Stress concentration : occur when any scratches or deep frenum notch or median diastema ----- these area are weak and stress concentrate on it lead to crack propagation and fracture at midline . or in case of too far buccal arrangement of teeth
- 4) Incomplete polymerization of the acrylic resin: occur due to improper curing of acrylic lead to weak denture lead to fracture .
- 5) Previous repair : because repair done with self cure acrylic which is weaker than heat cure so led to fracture.

B. Patient factor :

1) Anatomical factor :

- ✓ Prominent median palatine raphe
- ✓ Thick mucosa covering the ridge crest
- ✓ Thin mucosa covering median palatine raphe
- ✓ Prominent labial frenum

2) High occlusal loads:

- ✓ Powerful masticatory muscles
- ✓ Bruxism or clenching habit

3) Accidental dropping of denture

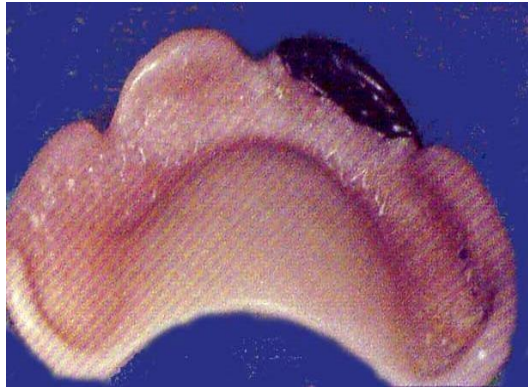
- ❖ No or insufficient relief in the midline. (M.P.R.) (Early fracture)
- ❖ Ridge resorption with loss of relief effect. (Delayed fracture)

Repair of maxillary and mandibular dentures:

- The fractured parts are assembled together in a proper relation shift with sticky wax on the polished surface
- The assembled denture is strengthened by wooden sticks or metal rod.
- Undercuts on the fitting surface of the denture are blocked out except in an area 2mm on each side of the fracture line.
- The fitting surface of the denture is lightly lubricated with Vaseline and a plaster or stone cast is poured.
- 2-3 mm of acrylic resin is ground away from the fracture side.
- A bevel is made on each side of the opening about 5mm wide along the entire midline on the palatal surface and continuous onto the labial surface or dovetails are prepared on either side of the fracture line. (the bevel to refresh acrylic to allow chemical bonding)
- The plaster cast is painted with a separating medium and the two pieces of the denture are placed back on the cast.
- The self cure repair material is applied by wetting the pieces to be repaired with monomer, the alternate application of monomer and polymer are made until the area is overfilled to allow for polishing.
- The denture is placed in a pressure curing unit for 30 minutes at 38°C.
- The denture is then finished and polished

Repair of a fractured denture with missing part:

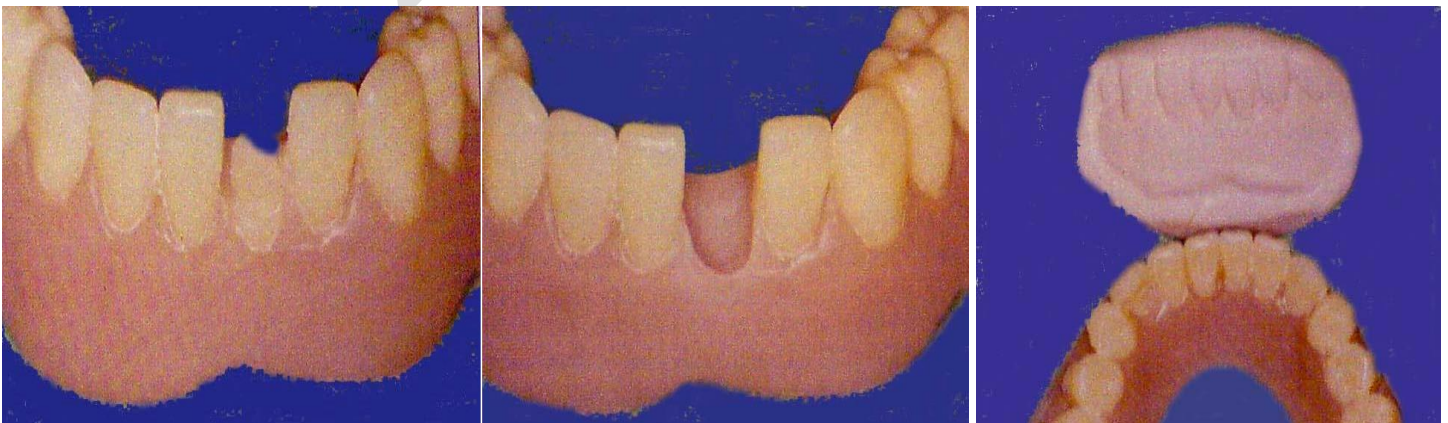
- Repairing a fractured denture with a missing part requires the upper and lower dentures to be placed in the patient's mouth in maximum intercuspation. An impression material (plaster or compound impression) is applied to the missing part, after setting of the impression material the denture is removed from the patient mouth, a cast is poured, Self curing acrylic resin is applied to restore the missing part.
- If the fractured part is present the same method as midline fracture



Replacing fractured teeth:

a- Anterior teeth:

- A tooth of proper size, shape and shade is selected to fit into the space and waxed up.
- A separating medium is applied to the labial side of the teeth and denture base.
- A plaster index is made.
- The tooth is removed, the wax is washed out with boiling water and detergent.
- The index is coated with a separating medium and placed in position.
- The tooth is set in place.
- The repair acrylic is made to fill the space around the tooth.
- The denture is placed in the pressure pot for 30 minutes. It is then cured, finished and polished.



b- Posterior teeth :

- Since occlusion is a factor when replacing posterior teeth the denture will need to be remounted for occlusal correction.
- Make plaster index which cover the occlusal surface of posterior teeth.
- The denture is mounted on the articulator, the fractured tooth is removed by grinding or heating and the same procedure is completed as for anterior tooth replacement.
- After curing and polishing the occlusion is checked and adjusted using articulating paper.



Dr. Zee

Denture relining

- ✓ It is procedure to resurface the fitting surface of an existing denture with new denture base material without changing its occlusal relation.

Advantages:

1. Increase stability and retention of the denture
2. Provide force distribution
3. Correct occlusion and vertical dimension
4. Improve esthetics and restore facial support

☒ Reline Indications :

- ✓ Whenever the denture loses or has poor adaptation to the underlying tissues, while all other factors as occlusion, esthetics, centric relation, V.D.O. and denture base material are satisfactory. (if any factor missed remake)
- 1- Residual ridge resorption to increase stability and retention.
 - 2- Ill fitted denture to increase adaptation of the denture to the tissues.
 - 3- Immediate denture after resorption occurs.
 - 4- Economic causes: to avoid the cost of the new dentures.
 - 5- Chronic ill and geriatric patient .

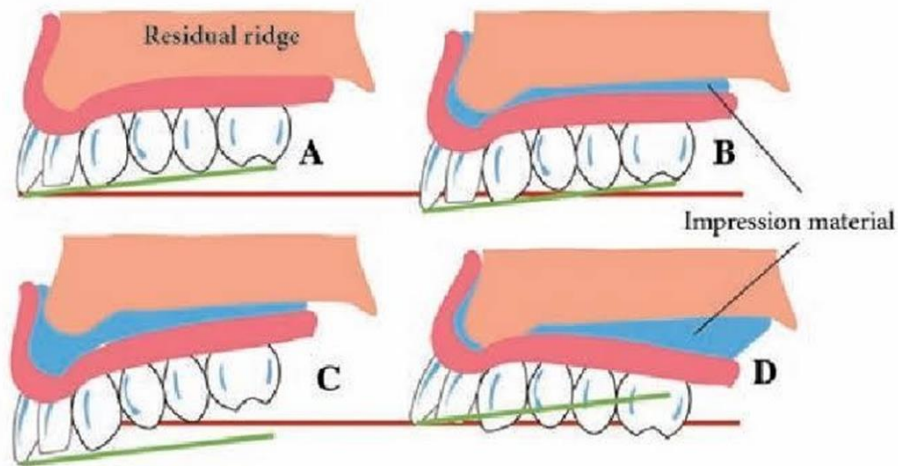
☒ Contraindications of relining:

1. When the following occlusal problems exists:
 - Centric relation not coincident with centric occlusion
 - Occlusal disharmonies (prematuer-deflective occlusal contact)
 - Incorrect occlusal plane
 - Increase vertical dimension of occlusion (decrease free way space)
2. Inadequate denture esthetics: bad color of the teeth or the denture base-in adequate size or form of the teeth
3. Inadequate denture phonetics
4. T.M.J. Problems
5. Excessive amount of ridge resorption exists
6. Excessive short denture border (not cover denture foundation)

☒ Disadvantages of relining:

1. May increase vertical dimension and produce occlusal errors
2. Increase the thickness of the denture base
3. Displacement of the denture base which may produce labial Prominence and change occlusal plane
4. Displacement of the soft tissue which cause interference with blood circulation and ridge resorption
5. Alter palatal contour which may change the speech

6. Vertical position, centric relation, patient control, material manipulation and esthetics are difficult to be satisfied at once.



Preparations for relining

A. Patient preparation:

♣ Patient examination: examine each of the following :

- Vertical dimension, centric relation, occlusal plane, inter Arch space
- Ridge undercuts and denture base tissue coverage
- Posterior palatal seal
- Speech and appearance

♣ Tissue preparation:

- Non-surgical prep: allow mucosal recovery by tissue rest, and use of tissue conditioner, tissue massage and soft diet.
- Surgical prep: excision of hyper plastic tissue- vestibuloplasty

B. Denture preparation:

- 1) Shorten all denture borders 2mm the except posterior border (make the borders flat for the impression material)
- 2) Grind the fitting surface 1-2mm to provide space for the Impression material
- 3) Correct occlusal disharmonies by selective grinding: establish Bilateral simultaneous contact in centric occlusion at accepted vertical dimension of occlusion
- 4) Boil the denture for 5 min to decrease internal stresses resulted From self cure acrylic resin
- 5) Remove the middle of the palatal portion of the maxillary denture ant to decrease denture displacement
- 6) Eliminate all undercuts in the denture base



C. Establishing occlusal relation (recording centric relation):

1. Using inter-occlusal record: It is a material used to register occlusal relation of opposing teeth: on which patient closes during relining

Advantages:

- Establish occlusal relation of opposing teeth during relining procedure
- Correct occlusal disharmonies in centric occlusion by making equal contact which provide equalized pressure on the soft tissue by the denture base while impression making

Materials:

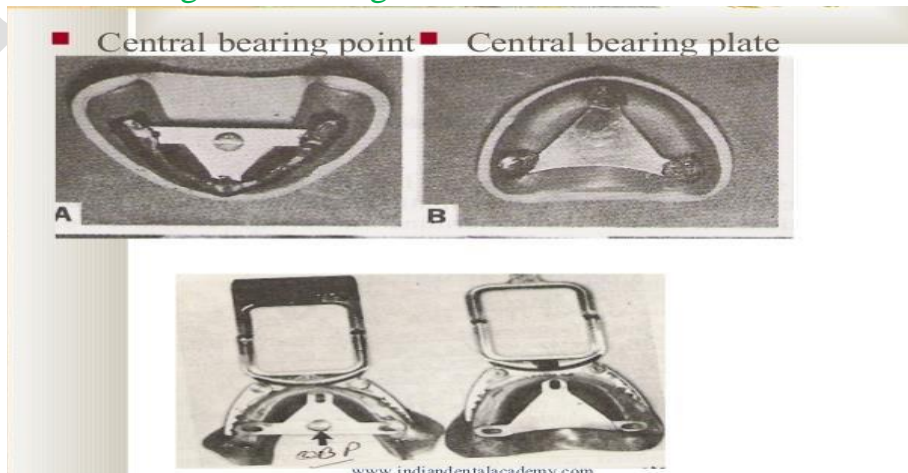
Requirements: inter occlusal record material should have the following requirements:

- ① High fluidity to decrease soft tissue distortion
- ② Hard and rigid when sets
- ③ Minimal dimensional changes
- ④ produce fine details (accuracy)
- ⑤ Minimal resistance to closure to avoid Mandibular deflection

Types: 1. Wax-compound-zinc oxide eugenol-plaster-silicone Rubber base.



2. Central bearing device: ex gothic arch tracer.



Precautions during relining

1. Avoid increase in vertical dimension of occlusion
2. Avoid changing horizontal relation (centric relation should be coincident with centric occlusion)
3. Avoid increase the thickness of the denture base
4. Avoid forward movement of the maxillary denture during Impression making
5. Obtain maximum inter-cuspatation in centric relation

Relining techniques

A- Open mouth technique

B- Closed mouth technique

I- Direct relining technique

- a. chair side technique
- b. functional technique

II. Indirect relining technique (laboratory relining) Maxillary denture relining

1. Technique (1)
2. Technique (2)
3. Technique (3)
4. Technique (4)
5. Mandibular denture relining Technique (5).

A- Open mouth technique

-After denture preparations were made, compound handle are added to maxillary and mandibular denture during impression making .

- Adhesive tapes are added to the polished surface of the upper and lower denture

-Use the upper and lower denture base to make maxillary and mandibular impression independently then make a new centric relation record to correct occlusal discrepancies

Advantages

- ✓ minimal patient cooperation needed
- ✓ Trimming and molding the peripheries during the impression possible thus avoiding thick denture peripheries

Disadvantages:

- Need more clinical and laboratory time
- Result in more occlusal errors



B. Closed mouth technique

- Use existing centric occlusion of the denture during impression making .
- May use centric inter occlusal record or needle point tracer to record centric relation .
- The patient perform functional movement during the impression: swallow-protrude lips-blow-protrude the compare and make it to the right and left.



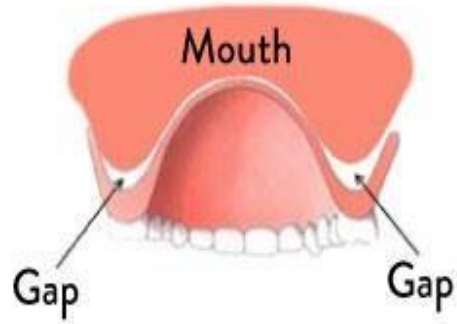
1-Direct relining technique

A- chair side Material used:

1. Hard relining material self cure acrylic resin
2. Soft relining materials: acrylic (self cure-heat cure) soft liner- silicone (self cure- heat cure) soft liner

Technique:

- After necessary denture preparations were made, self cure acrylic – Resin or soft lining material (acrylic ,silicone) is mixed and applied to the fitting surface of the prepared denture
- The denture is inserted in the patient mouth and the patient gently bites in centric occlusion to ensure that the occlusion remain Unchanged
- The denture was kept in place for 5 min then removed and placed in the hydro-flask for completing the curing to decrease porosity in the relining
- In case of soft liner or tissue conditioner used, excess relining material was trimmed with sharp scalpel



Advantages: High adaptation of the fitting surface of the denture to the underlying soft tissues

Disadvantages:

- Chemical burn of the patient mucosa due to irritation from residual monomer
- Porous relining may result leading to bad odor, fungal growth and unstable color of the relining
- Is short term solution

Functional impression technique Steps: -Correct occlusion of the old denture-centric relation should coincident with centric occlusion

- ✓ Denture borders reduced 1-2mm and the fitting surface of the denture ground 2mm to provide room for the impression material (tissue conditioner)
- ✓ Oral tissues should rest 24 hours before impression making
- ✓ Tissue conditioner is mixed and applied to the prepared denture and the denture is inserted in the patient mouth and the patient is asked to close in centric occlusion
- ✓ The denture is removed and excess tissue conditioner is trimmed with sharp scalpel.
- ✓ The denture is reinserted in the patient mouth and the patient is dismissed for 5 days and instructed to perform functional movement (**eating- swallowing-speaking**) and par functional movement (during sleep). **Avoid eating solid or hot food**
- ✓ The material is not allowed to remain in patient mouth more than 1 week as after this period it is hardened, lost plasticizers and cause tissue injury
- ✓ Patient returned and denture is examined for denuded areas (areas in which tissue conditioner removed), mark these area with indelible pencil and relieve these areas.
- ✓ New layer of tissue conditioner is applied and ask the patient to wait 30 min in the waiting room and eat a light meal, if no pressure areas were detected allow the tissue conditioner to remain 45 min in place .To ensure registration of fine details
- ✓ This impression is satisfactory for the lower ridge, but for the upper ZOE wash impression is taken



Advantages:

- More equal load distribution due to viscoelastic properties of the tissue conditioner .
- Low initial viscosity and steady rise in elasticity allow the tissue to return to normal condition.
- Record the mucosa during function.
- Achieve maximum extension into buccal and lingual sulci .

Disadvantages:

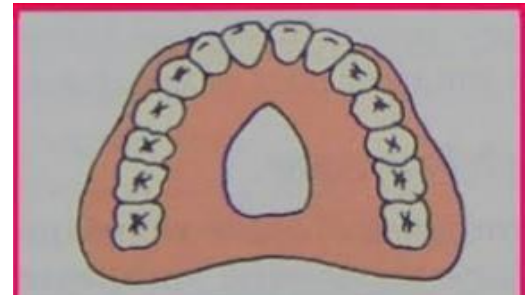
Not record fine details so need wash impression

II. Indirect relining technique (laboratory relining)

- The impression is made with prepared denture while patient closes lightly in centric occlusion
- The technician replaces the impression material in the laboratory with self cure acrylic resin (to decrease warpage)

**a) Maxillary denture relining****1. Technique (1) Steps:**

- Large part of the middle of palatal portion of maxillary denture is removed as no resorption occur in the palate (resorption occurs at ridges only)
- Make impression with the prepared denture using zinc oxide eugenol (ZOE) while patient bites on previously made interocclusal record
- Make impression to the exposed part of the palate with quick setting plaster

**Advantages:**

- Minimize increase in the vertical dimension
- Minimize displacement of the upper denture forward during impression making by decreasing hydraulic pressure inside the fitting Surface of the denture

Disadvantages:

- Difficulty in relining both dentures at the same time
- Not completely eliminate forward movement of the upper denture

2-Technique (2): Steps:

- ♣ Outline the area of the palate needed to be removed and grind it (deepen it without

complete removal) then make multiple perforation at 5-6 mm interval in this depression to facilitate palatal portion removal during packing

♣ Impression taken to the labial flange and the alveolar ridge between the 2 canine areas using impression wax (Iwa wax) to decrease forward movement of the upper denture

Advantages:

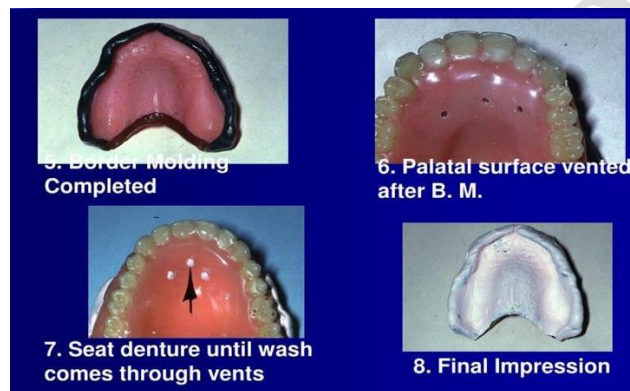
Decrease forward movement of the upper denture

Disadvantages:

Difficulty to work with impression wax due to distortion

3. Technique (3): Steps:

Labial and palatal flanges perforated to decrease hydraulic inside the upper denture during impression so decrease movement of the denture



4. Technique (4)

Steps:

- Denture border shortened to make a flat border
- Adhesive tape is attached to the labial and buccal surface of the maxillary denture short 2mm from the borders
- Large opening is prepared in the palatal portion of maxillary denture to decrease denture displacement during the impression

b) Mandibular denture relining

5- Technique (5)

Indication: to restore loss of vertical dimension of occlusion

Steps:

- Compound added to the occlusal surface of mandibular posterior teeth and ask the patient to say M' till obtain correct vertical dimension
- Mount the upper cast to the articulator with face-bow and the lower cast is related to the upper cast with the compound inter occlusal record in maximum

intercuspatation and mounted

- Remove compound from occlusal surface of mandibular posterior teeth and soften it and transfer it to the filling surface of the lower denture
- Close the articulator till incisal pin touch the incisal table

Advantages:

Restore vertical dimension and decrease errors in centric relation

Disadvantages: Time consuming



Impression materials used for relining Requirements:

- Produce fine details
- Have sufficient flow to decrease displacement and trapping in the Palatal area

Types:

1. Zinc oxide eugenol:

- High accuracy (produce fine details)
- Decrease pressure and decrease tissue distortion
- Dimensional stability
- Have burning sensation due to eugenol content: use non-eugenol ZO In case of inflamed mucosa

2. Light body rubber base:

- Produce fine details, good tissue adaptation
- Have high flow, minimal tissue displacement
- Long setting time

3. Compound:

Used to restore VD, used with ZOE wash

4. Plaster:

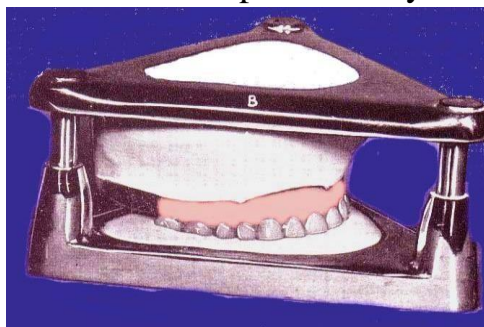
- High flow and minimal tissue displacement
- Break from the undercut on removal

Denture rebasing

- ✓ Is a process of readaptation of denture to the underlying tissue by replacing the denture base material with a new without changing occlusal relation
- **Indications:**
 - ✓ When the existing denture base is unsatisfactory e.g. stained, crazed or porous.
- **Procedures:**
 - ❖ **Denture preparation:**
 - ✓ An impression is made with the denture and a cast is obtained as mentioned in relining.
 - ❖ **Laboratory preparation**

1) Jig or articulator methods

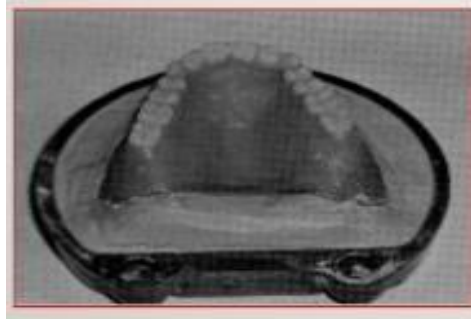
- ✓ An occlusal and incisal index of the teeth is made in plaster using Hooper duplicator. The posts of the lower part of the duplicator are seated in the upper part to maintain the relationship of the casts to the plaster index.
- ✓ The denture with the impression material are removed from the cast.
- ✓ Artificial plastic teeth are sectioned from the denture and all base material around the teeth is removed. (porcelain teeth are removed by flaming) but acrylic teeth removed by cutting as one piece.
- ✓ Teeth are placed and held in position in the index using sticky wax on the labial and buccal surface.
- ✓ A layer of base plate wax is placed over the ridge of the cast.
- ✓ The upper part of the duplicator is closed and denture teeth are waxed to the proper thickness and contour to the cast.
- ✓ The cast is removed, flaked and processed in the usual manner
- ✓ After deflasking, the cast is reattached to the upper part of the duplicator to adjust any occlusal errors.
- ✓ Occlusion of rebased denture is further perfected by clinical remount.



2) Flask method:

- ✓ Denture is half flaked (flask to the first layer of flask)
- ✓ Silicone mold material painted on denture and teeth to provide sufficient flexibility during denture removal .

- ✓ Complete flasking
- ✓ Flask is opened after the flasking stone has set. The resilient silicon allow the denture to be withdraw without damage.
- ✓ Remove the teeth
- ✓ Cast and investing stone painted with separating medium
- ✓ Pack the acrylic resin in the mold and cure, finish and polish the denture
- ✓ Replace the teeth in the silicon mold



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