Duplicate Denture
Outline

- Introduction
- Indications of duplication.
- Techniques of denture duplication
- Conclusion
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Introduction

- The habituation of the oral sensory receptors and the acquisition of new muscular skills are slowly developed qualities with drastic effect on the acceptance and successful manipulation of dentures.

- With advancing age, because of progressive atrophy of the cerebral cortex, the learning process deteriorates, resulting in subsequent diminution in the ability to develop new muscular behavior.
- Therefore, the objective of the various coping methods described over the past 40 y is the provision of new dentures by copying the satisfactory features of the existing dentures and eliminating the unsatisfactory features.

- This procedure reduces not only the number of visits needed to fabricate the dentures but also the number of post insertion follow ups.

Introduction

- Over the years, a variety of techniques have been developed and various materials are available for denture duplication.

- In one of the first duplication procedures the denture was irreversibly altered during the process. However, as materials and techniques have evolved, the procedure requires no alteration to the denture base.

Outline

- Introduction
- **Indications of duplication.**
- Techniques of denture duplication
- Discussion
Indications of duplication.

1- Impression tray.
2- Initial replacement in the fabrication of a new denture. (Temporary denture)
3- Radiographic and Surgical stent in implant therapy.
4- Treatment denture with tissue conditioner.
5- Research purposes.
Outline

- Introduction
- Indications of duplication.
- Techniques of denture duplication
- Discussion
Techniques of Denture Duplication:

Keep in mind

Techniques of Denture Duplication:

- An oral examination and evaluation of the patient and the prosthesis is completed prior to the duplication procedures.

- The denture should be examined and evaluated for existing or repaired fractures, craze lines, and missing or replaced teeth.

Techniques of Denture Duplication:

- Esthetics, phonetics, accuracy of fit, and vertical and centric relation must also be verified.

- The patient is then advised whether the existing dentures should be duplicated or remade.

Techniques of Denture Duplication:

Duplication of complete dentures using autopolymerizing acrylic resin: a review of techniques. Inter. J Prosth Dent. 2011:2(1)8-11
Techniques of Denture Duplication:

- Self cure acrylic resin
- Heat cure acrylic resin
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Techniques of Denture Duplication:

I. Denture duplication using autopolymerizing acrylic resin.

1. Modified flask method using silicone impression material (Manoli 1969)
2. Pour resin flask method (Boos and Carpenter 1974)
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)
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Pour resin flask method (Boos and Carpenter 1974)

Technique:

1- they used specially designed flask (pour type flask)

2- Mount the denture to the bottom of the flask using heat resistant clay (Omnidental Block-out Compound)

Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

3- **Assemble** the flask, and **fill it** with **hydrocolloid**.

4- **Disassemble** the flask, **remove the clay** and the **denture** from the mold
Pour resin flask method (Boos and Carpenter 1974)

Technique:
5- Remove the denture from the clay, reinsert the denture in the flask.

6- Second pouring of hydrocolloid. This second pouring will form the final cast.
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

7- Disassemble the flask. The two separate pouring of hydrocolloid will separate when blown with compressed air.

8- Place the hydrocolloid mold in warm water (**about 115’ F.**) for **5 minutes**.

9- Remove the hydrocolloid mold from water, and dry it well with compressed air. **Warming** and **drying** the mold will **prevent** any sweating of the mold.
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

10- Set the hydrocolloid cast aside with a moist towel placed over it. This is to prevent shrinkage.

11- Cut **inlet** and **outlet** sprue holes in the hydrocolloid
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

12- With a sweeping motion, a saturated brush loaded with saturated tooth-colored acrylic resin is brought in the hydrocolloid mold with successive loads.

13- Care must be exercised in preventing teeth in the mold from drying out by moistening the resin with a brush of monomer.
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

*Advantages of brush technique:*

1- Shading of individual teeth is possible by using this brush technique **instead of pouring teeth in one shade and one connected block.**

2- **Eliminates separate curing** of resin teeth and the denture base.

3- Neat gingival outline can be maintained.
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

14- "Top off" each tooth with an extra button of tooth acrylic resin at its neck. This assures enough thickness in this region to prevent the pink base acrylic resin from shading through and altering the color of the tooth.

15 - Dry the hydrocolloid cast with compressed air, places it in the mold, and reassemble the flask with the sprue holes up.
Pour resin flask method (Boos and Carpenter 1974)

**Technique:**

16- Mix pour-type denture resin into one sprue until it appears in vent sprues.

17- When gloss has left the exposed acrylic, place the flask in a pressure cooker containing water at 115 to 125 F. Apply 20 to 30 pounds of air pressure, and cure the resin for 30 minutes.

18- Defflask and finish the denture.
Pour resin flask method (Boos and Carpenter 1974)

Disadvantages
1- requirement of a special flask
2- formation of voids in the denture.
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1. Modified flask method using silicone impression material (Manoli 1969)
2. Pour resin flask method (Boos and Carpenter 1974)
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

Technique:
1- modified the denture flask by removing a rectangular section from the upper part to provide access for the sprues(8).


**Technique:**

2- Sprues made of utility wax with a diameter of 15 mm were attached to the lingual surface of the heels of mandibular dentures and to the palatal surface of the tuberosity region of maxillary dentures.

**Technique:**

3- Alginate was **mixed** and placed into the **fitting surface** of the denture, taking care to **avoid** the entrapment of air.

4- The remainder of the alginate mix is placed in the lower part of the flask. Alginate filled denture was settled into the mix, as during a routine flasking procedure.

**Technique:**

5- After the alginate had set **upper part** of the flask was **placed** in position, and the **wax sprues** were **adapted** to seal the rectangular opening.

6- Alginate was mixed and poured into the flask slowly. A finger or brush was used to **wipe alginate onto the teeth** of the denture to minimize voids.

**Technique:**

7- After the alginate had set, the flask was opened, and the denture and sprues were removed. Self cure tooth-colored resin of the proper shade was added to the teeth indentations by the sprinkle-on or paint-on method.

**Technique:**

8- Pour-type resin was mixed and poured into one sprue until the resin filled the mold and extruded through the other sprue. The denture was cured at **20 psi** for **30 minutes**.

Technique:

- The change was in the fabrication of the teeth. Through mixing of full self cure acrylic resin template.


**Technique:**
- used this template as a special trays for making a secondary impression in closed mouth technique, master casts,
- mounting on articulator
- setting of teeth with proper shade and size,
- then try in the patient mouth, flaking.
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I. Denture duplication using autopolymerizing acrylic resin.

1. Modified flask method using silicone impression material (Manoli 1969)
2. Pour resin flask method (Boos and Carpenter 1974)
5. Two tray method (Cooper and Watkinson1976, Lindquist 1997)

- Wagner (1970) has described a method of duplicating complete dentures by using reversible or irreversible hydrocolloid and a cup as a flask.*


- Singer (1975) has modified the method by using dental floss to section an alginate irreversible hydrocolloid mold poured in a ceramic cup. *


**Technique:**

1- **Attach wax sprues** to the most distal, polished surfaces of the denture.

2- Press a **swab stick** into the wax sprues so the denture **nangs** freely within the cup.

**Technique:**
3- Pull a piece of dental floss through a piece of periphery wax to make the floss tacky.

4- Press the floss onto the flanges of the denture about midway between the teeth and the border of the denture.

**Technique:**

5- Pour the thin mix of irreversible hydrocolloid into the cup.

6- Lower the denture into the center of the cup until the denture is suspended by the stick and allows the irreversible hydrocolloid to gel.

**Technique:**

7- **Pull the floss** around the irreversible hydrocolloid mold to cut it in half.

8- **Separate the halves of the mold and remove the denture.**

**Technique:**

9. Fill the impressions of the teeth with the mixture of **tooth-colored resin**.

10. **sprinkle pink polymer** on the surface of the mix so that the tooth-colored material **will not flow**.

Technique:

12- Reunite the mold halves and replace the mold in the cup.

13- Immediately pour the thin mix into the enlarged sprue hole until the mix fills the mold space and appears in the other sprue hole.

**Technique:**

14- After the acrylic resin polymerizes, remove the mold from the cup and separate the denture from the mold.

15- Trim the flash and the sprues from the denture; finish and polish it in the usual manner.
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5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

- Cooper and Watkinson 1976, introduced a technique in which they used two impression trays along with the impression material and the sprued denture to be duplicated to create a mold.

5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

- **Terry Lindquist 1997**, modified this tech. by using a *layer of putty consistency* poly vinyl siloxane impression material and also *lined the tissue surface* of the denture with *light body* poly vinyl siloxane impression to create a mold space.
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

**Technique:**

1. Alginate impression material is mixed and loaded into a **stock tray** and the **complete denture is seated** into the alginate **just below** the denture borders.
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

Technique:
2- After setting, trim excess material and cut three grooves in the alginate one anteriorly and one buccally on each side.
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

**Technique:**

3- Record the tissue surface of the denture with a 2\textsuperscript{nd} alginate mix in another stock tray, the result is a mold of alginate supported by two large upper stock trays.

4- After setting separate the two trays and the denture removed and delivered to the patient.
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

**Technique:**

5- Two channels are **created** in the posterior segment of the set alginate.

6- Mix **tooth colored** cold cure acrylic resin of proper shade and pour in the teeth indentation, after curing the resin block is **removed**, trimmed and replaced back into position.
5. Two tray method (Cooper and Watkinson 1976, Lindquist 1997)

**Technique:**

7- Assemble the two halves of the alginate mold together through the grooves and notches and secure them tightly with rubber bands.

8- Mix a pour type resin and pour it into one of the openings until excess flows out to the other opening.

9- The assembled unit then placed in a pressure pot at 20 psi for 30 mins, and then the acrylic template finished and polished.
Techniques of Denture Duplication:

- Self cure acrylic resin
- Heat cure acrylic resin
Techniques of Denture Duplication:

II. Denture duplication using heat cure acrylic resin.

1. Flask method (Azarmehr P & Azarmehr HY 1970)
2. A technique by Izharul Haque Ansari (1994)
3. Duplication procedure for complete dentures by CAD/CAM. (Kawahata N et al 1997)
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)
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1. Flask method (Azarmehr P & Azarmehr HY 1970)

- They used **two identical flasks with interchangeable** sections for denture duplication.

1. Flask method (Azarmehr P & Azarmehr HY 1970)

**Technique:**

1- after tried in the waxed denture, investing and boiling out, separate and clean the flask.

2- Carefully remove the teeth from the flask and place them on a piece of base-plate wax
1. Flask method (Azarmehr P & Azarmehr HY 1970)

**Technique:**

3- Two sheets of base-plate wax are adapted on the A section of original flask.

4- The b section of the duplicating flask is adapted on the A section of the original flask, and it is filled with artificial stone.
1. Flask method (Azarmehr P & Azarmehr HY 1970)

**Technique:**
5- duplication of the mold of the original flask (A, B) using the duplicating flask (a, b).
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1. Flask method (Azarmehr P & Azarmehr HY 1970)

**Technique:**

6- A similar set of teeth (t) is selected.

7- processing
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2. A technique by Izharul Haque Ansari (1994)

- Requires no special equipment or material for duplicating the old dentures to make replica dentures.

2. A technique by Izharul Haque Ansari (1994)

**Technique:**

1. Roll base-plate wax to form **two sprues** approximately 10 mm in diameter.
2. **Attach** two wax sprues to the **tuberosity region** of the maxillary denture.
3. Adapt **Putty Soft material** to the **fitting** surface of the denture and insert a **few wire loops**.
2. A technique by Izharul Haque Ansari (1994)

Technique:

4- With base-plate wax make a rectangular box slightly bigger than the denture.

5- Apply petroleum jelly thinly to coat the polished surface and teeth of the denture.
2. A technique by Izharul Haque Ansari (1994)

Technique:
6- Place a **mix of dental plaster** onto the soft material and **vibrate** the remainder of the dental plaster **into the wax box**. Invert the denture into it.
2. A technique by Izharul Haque Ansari (1994)

**Technique:**

7- After the plaster has set, **remove** the wax box and trim the excess plaster then **Key the plaster** and apply tinfoil substitute to cover the set plaster.
2. A technique by Izharul Haque Ansari (1994)

**Technique:**

8- Adapt some *Putty Soft material* to cover the *denture teeth* and insert some *wire loops* for plaster retention.
2. A technique by Izharul Haque Ansari (1994)

Technique:
9- Vibrate dental plaster into another rectangular wax box.
   the invested first half of the denture was inverted into the mix of plaster in the wax box to complete the investing. After the plaster has set, remove the wax box.
2. A technique by Izharul Haque Ansari (1994)

Technique:

10- Separate the two halves of the mold, and remove the denture and sprues.

11- Immerse both halves of the mold in warm water for 5 minutes to prevent pink wax from sticking to plaster.
2. A technique by Izharul Haque Ansari (1994)

**Technique:**
12- Reposition both halves of the mold with plaster keys and pour molten pink base-plate wax into one of the sprue holes until it exudes through the second sprue hole.
2. A technique by Izharul Haque Ansari (1994)

**Technique:**

13- Allow the wax to harden and separate the mold to recover the wax dentures.
2. A technique by Izharul Haque Ansari (1994)

**Technique:**

14- Make maxillary and mandibular final impressions with the patient’s old dentures as custom trays.

15- Transfer the wax dentures onto casts made from the new impressions.

16- Try in the wax dentures and verify the orientation of the occlusal plane, tooth positions, and esthetics.
2. A technique by Izharul Haque Ansari (1994)

Technique:
17- jaw relation record and mount the casts and wax dentures in an articulator.
18- Cut off each tooth individually from the wax denture and replace acrylic resin tooth of the appropriate shade and contour.

19- Try in the dentures in the mouth, and process in the usual way.
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II. Denture duplication using heat cure acrylic resin.

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3. Duplication procedure for complete dentures by CAD/CAM. (Kawahata N et al 1997)

- CAD/CAM systems have increasingly been applied in the dental field.

- In the field of restorative dentistry, there have been many studies on the fabrication of prostheses using a CAD/CAM system. (Duret, Blouin & Durei, 1988; Andersson et al., 1989; Monnann et al., 1989; Kawanaka, 1990)
- **In contrast**, there have been only a *few studies* on CAD/CAM systems in denture prosthetics (Minoura et al., 1993; Kawahata et al., 1994b; Maeda et al., 1994).

- **Kawahata et al.**, 1990; Kawahaia et al., 1993, studied the fabrication by duplication of the occlusal surface of the molar artificial teeth in the complete denture using a contact type measurement system.
3. Duplication procedure for complete dentures by CAD/CAM. (Kawahata N et al 1997)

- Ono et al. 1991; Kawahata et al. 1994a; Kawahata et al. 1995, evaluated the diagnostic method on the morphology of the plaster model of the residual ridge of edentulous jaws by three-dimensional reconstruction.
3. Duplication procedure for complete dentures by CAD/CAM. (Kawahata N et al 1997)

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Technique:
- A 2-tray technique was used with polyvinyl siloxane putty. After polymerization, the patient’s dentures were removed, cleaned, and returned unchanged.

- Molten wax was poured into the half of the mold containing the teeth.


**Technique:**

- **Resin** was thoroughly poured in 1 sprue opening until it emerged from the other side.

- The **entire mold** was placed under water in a pressure pot for 20 minutes. When polymerized, the replica dentures were removed from the mold and the sprue and rough areas were trimmed and the dentures were polished.

Technique:
- The duplicate maxillary denture was mounted on an articulator using a face bow transfer and centric relation record.

- Wax teeth of the replica denture were removed and replaced with new denture teeth.

Technique:

- Reline impressions were made within the duplicate denture base using closed mouth technique.

- The denture base reline impressions were rebased in the normal laboratory way.
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- A **sectional mold** and **dental stone** are used to invest the denture, and heat-activated acrylic resin is used to duplicate both the denture teeth and base.

5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

**Technique:**

- Make a **final impression** with a thin layer of **zinc oxide eugenol** in the **original denture** through **closed mouth** technique.

- Create a master cast by pouring the impression with stone.

- **Flask the master cast and original denture** in the lower half of a Broden flask by using dental stone.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

Technique:

- (2\textsuperscript{nd} layer) though painting the outer surface of the denture with the stone mixture until only the tips of the teeth remain.

- Apply \textit{separating medium} on the stone surface and pour a third layer of stone (the cap stone) to complete the flanking.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

**Technique:**
- Complete the deflasking **after immersing** the flask in **warm water** at 70°C for 15 minutes for easier removal of the denture from the cast.
- **Remove the cover** of the **upper half** of the flask, **loosen** the lateral screw, and remove the stone with the denture.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

**Technique:**
- Separate the cap stone layer from the second layer by using a plaster knife.

- Make 3 cuts with a mini-saw in the heals and at the midline on the second layer of stone.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

**Technique:**

- With a **plaster knife**, separate the second layer from the denture. Clean the denture, and return it to the patient.

- Gently reassemble the 4 stone pieces to their original positions in the upper half of the flask, and then tighten the lateral screw.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

Technique:
- Separate the flask, and **immerse the upper half in warm water** for 5 minutes. Melt hard modeling wax in a container, and then pour the molten wax into the teeth mold.

- After **gradual cooling**, **immerse** the upper half of the flask in **cold water** (25°C) for 15 minutes. Remove the cover of the upper half of the flask, and loosen the lateral screw of the flask.
5. Sectional mold technique (Mohamed TJ and Faraj SA 2001)

Technique:
- Remove the stone and wax from the flask gently.

- Flask the arch wax in another flask. Then process the arch wax in tooth-colored heat activated acrylic resin.
Technique:
- Place the **acrylic arch teeth** in position on the cap stone with the other 3 pieces of the second layer.

- Pack and cure **pink heat-activated** denture base material. Finish and polish the duplicate denture.
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Conclusion

- All the techniques discussed involve the formation of a mold cavity using the original denture to be copied.

- Materials used for the formation of the mold are irreversible hydrocolloid, reversible hydrocolloid, and elastomers of different viscosities.

- The accuracy of the reproduction depends on the accuracy of the material used in the formation of the mold.
Conclusion

- It can be assumed that the most accurate reproduction will be produced by the elastomers. *

- The polymerization shrinkage and dimensional stability of the autopolymerized acrylic resin used in the fabrication of the duplicate dentures may also affect the accurate reproduction of the denture surfaces and the positions of the teeth.

Conclusion

Considering the above variables it can be emphasized that the refinement of occlusal contacts is important during the insertion of the duplicate dentures.
QUESTIONS

Thank You