



Complete denture

Materials used for primary, secondary and boxing impression

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Lecture 4

Materials used for primary, secondary and boxing impression

Dental Impression: is an imprint or negative likeness of the teeth and /or edentulous area & adjacent tissue .

Complete dental impression: It's a negative registration of the entire denture bearing, stabilizing & seal area of either the maxilla or the mandible.



Objectives of impression making

Complete denture impression procedures must provide five objectives:

- 1- Retention 2- Stability 3- Support for denture.4- Esthetic
- 5- Preservation of the residual alveolar ridge & soft tissue.

Retention:- The resistance in the movement of a denture away from its tissue foundation especially in a vertical direction.

Note : Retention is the constant relation of the denture base to underlying soft tissues, while stability is the relation of the denture base to underlying bone. This relations may be constantly changing. Retention must hold the denture in it's position when it is setted at rest. Stability must resist displacement by rocking when a force is applied to teeth over a limited area.

Support: Is the quality of prosthesis to resist displacement from the denture supporting foundation, therefore, the greater the amount of area covered the greater the support. The best support for denture is the compact bone covered with fibrous (connective tissue).

- ☐ Retention = Denture base + soft tissue.
- ☐ Stability = Denture base + Bone.
- ☐ Support = Denture base + Bone + soft tissue.

Esthetics :- Border thickness should be varied with the need of each patient in accordance with extend of residual ridge loss. The vestibular fornix should be filled, but not overfilled, to restore facial contour.

Preservation : Preservation of the remaining residual ridge is physiologically accepted that with the loss of the stimulation of the natural teeth the alveolar ridge will atrophy or resorb.

Primary impression and materials used for primary impression:

It is a negative likeness made for the purpose of diagnosis, treatment planning & construction of special tray. It is the first impression made for the patient and from which the study cast was produced. These impressions are obtained by a stock tray.

Materials used for making primary impression:

- 1- Impression compound.

2- Alginate impression material.

3- Rubber base impression material (heavy body).

impression compound:

It is a thermoplastic compound i.e. it softens when heated and hardens when cooled. This process does not involve a chemical reaction.

Impression compound is available in 2 forms:

1-Stick form - used for modifying impression trays. Softening temperature is 70°C.

2- Sheet form - used to take impressions of the mouth. Softening temperature is 55-60°C.

ADVANTAGES

1-Nonirritant and nontoxic

2-Reusable (but with re-use the constituents are leached out)

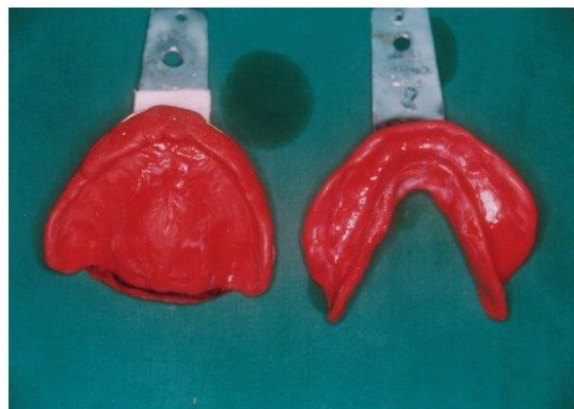
3-Can be reheated and readapted

DISADVANTAGES

1. Poor dimensional stability

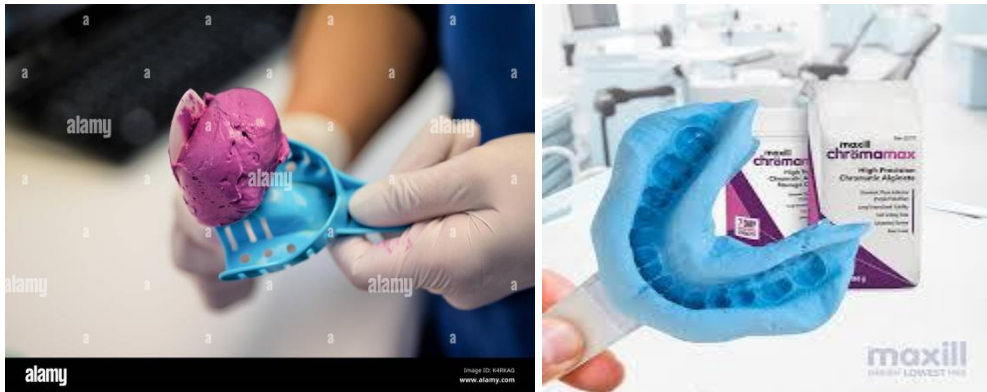
2. Poor surface detail

3. Will distort if removed from undercuts



Alginate impression material:

is one of the most widely used impression material it irreversible hydrocolloid impression material which is used to take impression of both dentulous and edentulous impression.



Composition:

On mixing the powder with water a sol is formed, a chemical reaction takes place and a gel is formed.

- 1-potassium sulphate to give high quality surface to the die and increase hardness and strength.
- 2-sodium phosphate used to control the working time
- 3-filler to control consistency and flexibility of impression
- 4-glycol to make powder dustless
- 5-pigments to provide color

ADVANTAGES

- 1.Non toxic and non irritant
2. Good surface detail and good elastic properties
3. Ease of use and mix
4. Cheap and good shelf life
5. cast are made no need for separating medium

NOTE: **syneresis** is the expulsion of water or other liquid molecules from dental impression materials (Alginate for example) after an impression has been taken. Due to this process, the impression shrinks a little and therefore its size is no longer accurate. For this reason, many dental impression companies strongly recommend to pour the dental cast as soon as possible to prevent distortion of the dimension of the teeth and objects in the impression. The opposite process of syneresis is **imbibition**, meaning, a material that absorbs water molecules from the surrounding. Alginate is also an example of imbibition since if soaked in water, it will absorb it.

Final impression (Secondary impression) :it is the negative reproduction of the entire denture foundation (including denture bearing and stabilizing areas) and border seal areas present in the edentulous mouth, which is used for making master cast that is used to fabricate a prosthesis. The final impression is made with special tray and it is used for making master cast which must be poured with stone material.

Materials used for final impression

- 1- Zinc- Oxide Eugenol impression material.
- 2- Alginate impression material
- 3- Impression plaster
- 4- Waxes
- 5- Elastomers impression material:
 - a- Polysulphide(Rubber base).
 - b- Poly ether.
 - c- Silicon (light body).

Zinc- Oxide Eugenol impression material.



ADVANTAGES

1. Dimensional stability
2. Good surface detail
3. Can be adhered well to the dried surface of compound, resin



DISADVANTAGES

1. Cannot be used in very deep undercuts
2. Only sets quickly in thin section
3. Eugenol allergy in some patients

Uses

- 1-final imp. For edentulous patients
- 2-relining and rebasing

Factor affecting setting time of ZOE:

- 1-temperature will be set more quickly at higher temperature and humidity
- 2-drop of H₂O or alcohol will speed the set
- 3- ratio of base -catalyst
- 4- saliva shorten the reaction

Boxing impression

Boxing: is the enclosure of an impression to produce the desired size & form of the base of the cast & to preserve desired details.



Note: Boxing impression can be used for primary & final impression for complete denture. This procedure cannot usually be used on impression made from hydrocolloid materials (e.g. alginate) because the boxing wax will not adhere to the impression material & the impression material (alginate) will be distorted.

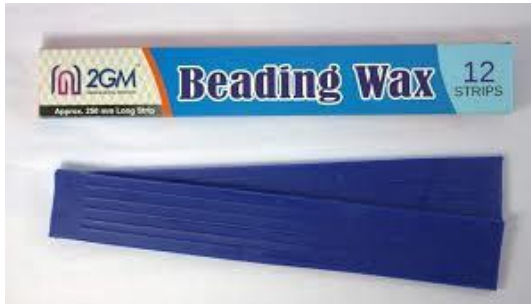
Advantages of boxing:

- 1- To facilitate pouring the impression with plaster or stone.
- 2- Produce the desired size & form of the base of the cast (adequate thickness of the cast).
- 3- Preserve desired details & borders of the impression
- 4- In the lower impression, reproduction of the lingual borders &

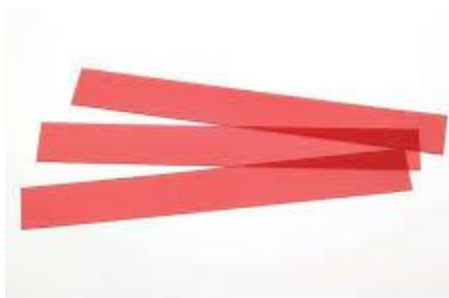
tongue space easier.

Materials used for boxing impression:

1- Beading wax: a strip of wax is attached all the way around the outside of the impression approximately (1-2 mm) below the border & sealed to it with wax knife



2- Boxing wax : a sheet of wax is used to make the vertical walls of the box & it is attached around the outside of the beading wax strip so that it does not alter the borders of the impression, the width of the boxing wax is about 10-15 mm.



3- Base plate wax: a sheet of wax can be used to fill the tongue space in the lower impression that is sealed just below the lingual border of the impression.