Lec. 5  
**Complete Denture 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.

**Stability:** Is the quality of prosthesis to be firm, steady or constant to resist displacement by functional horizontal or rotational movement.

- 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. Prosthodontist should keep in mind the effect of impression material & technique on the denture base & the effect of the denture base on the continued health of both the soft & hard tissues of the jaws.
**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.

- For the upper stock tray, the posterior border of the tray should cover the maxillary tuberosity & hamular notch, anteriorly should include the anterio-alveolar ridge.
- For the lower stock tray posteriorly should cover the whole area of retromolar pad area & anteriorly include the alveolar ridge.

- **Materials used for making primary impression:**
  1. Impression compound.
  2. Alginate impression material.
  3. Rubber base impression material (heavy body).

**Primary cast (study model or diagnostic cast):** A cast formed from a preliminary impression for use in diagnosis or the fabrication of an impression tray.

**Production of study cast (primary cast):**
The primary impression is poured or casted in plaster (after beading & boxing) to get the primary cast or study model which is the positive reproduction of the oral tissues.

The plaster mixed with water by the saturation method in the rubber bowel. When the plaster become hard, the cast is separated from the impression by the use of hot water (55°C-60°C). When using very hot water, the impression compound will be sticky & it will be difficult to remove from the cast. The special tray will be constructed on the primary or study cast which is used to make final impression.

After construction of special tray, it is tried in the patient mouth & checked for proper extension & adaptation on the alveolar ridge as good impression cannot be obtained unless it is made. So a correct special tray is a primary fact in obtaining a good working impression.

**Final or Secondary impression:** It is a negative likeness or registration of the entire denture bearing, stabilizing area and border seal area of the mandible & maxilla for the purpose of fabricating a prosthesis.

**Final impression in general:** The impression that represents the completion of the registration of the surface or object.

The final impression is made with special tray and it is used for making master cast which must be poured with stone material.
Master cast (definitive or final cast): A replica of the tooth surfaces, residual ridge areas and/or other parts of the dental arch and/or facial structures used to fabricate a dental restoration or prosthesis.

- **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).

- **The techniques used for making final impression:**
  1. Mucostatic impression technique (non-pressure technique)
  2. Muco-compression or Functional impression technique (pressure or closed moth technique).
  3. Selective pressure impression technique.

- **Boxing impression and making the casts:**
  - **Boxing**: is the enclosure of an impression to produce the desired size & form of the base of the cast & to preserve desired details.
  - 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.

Artificial stone is mixed according to the manufacturer’s direction and sufficient stone is poured into the final impression so that the base of the cast will be from 10-15 mm in thickness. The cast is called master cast.

**Common faults in impression making:**

1- Poor selection of the tray.
2- In sufficient material loaded in the tray.
3- Excessive material loaded in the tray.
4- Failure to press the tray completely to position (insufficient seating pressure or excessive seating pressure).
5- Incorrect position of the tray (uncentralization).
6- Obstruction of the proper flow of the material by lips, cheek or tongue.
Upper and lower study cast
Production of master cast

- Special tray ➔ Final impression
- Pouring with stone material ➔ Master cast

Upper and lower final impression
Wrap a sheet of red boxing wax around the beading wax to form a container. All joints must be sealed with hot wax to prevent stone from leaking through.

**MAXILLARY IMPRESSION**

**MANDIBULAR IMPRESSION**

- Apply a strip of red beading wax to the sticky wax layer to form the land of the cast.
- Close the lingual tongue area of the impression with a sheet of wax or with pumice and plaster.