***Title of Lecture:* Complete denture construction**

***Date of Lecture:* 14/10/2015**

***Sheet no:*  *3***

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**Steps of complete denture construction :**

Clinical steps:  
-Primary impression > secondary impression > bite registration > try in denture > dental delivery > follow up.

* After making the primary impression, we move to the special tray (lab step) constructed on the primary cast, then move to second step which is master impression or final impression then the wax rim and jaw relation "bite registration " after that selection of teeth and trying the wax in patient’s mouth then delivery of denture and finally follow up.
* The primary impression (or the preliminary impression) is the first step in complete denture construction.  
  it is by definition the negative registration of the soft and hard tissue in the oral cavity, and the entire denture bearing area, in order to make a model for the purposes of diagnosis and construction of the special tray.
* Take an impression vs. Make an impression:  
  -Make an impression is more accurate, because as dentists we have an idea about the physiology and anatomy of the oral cavity, and we make a negative copy of what we have in mind.
* The main object of the primary impression: to record the whole denture bearing area for each arch, and the depth of the sulcus, and the whole landmarks. And this supports our argument of “making an impression”.
* The main landmarks in each arch should be reviewed.
* Instruments :  
  1. Edentulous stock trays: either plastic or metal, perforated or non perforated.   
  2. stanley knife. (the wider the blade the better)  
  3. Water bath. (60-65C according to the impression material)  
  4. Impression material : -impression compound (why do we prefer it? Because it’s mucocompressive, and at this stage the mucosa should be compressed to achieve the function)  
  -alginate  
  -compound and alginate. (the ideal impression material for the primary impression is a combination of compound and alginate)  
  5. Rubber bowel and spatula  
  6. Apron and gauze.  
  7. Examination set.   
  8. Alcohol lamp.  
  9. Wax knife  
  10. Patient’s file and manual
* The position of the patient and the operator:  
  -if the operator is right handed, working on the lower arch : his position is in front of the pt to his right. The position of the pt is at the level of the shoulder, in the upright position. \*left handed people just do it the other way around.  
  -right handed, upper arch: behind the pt, and at the level of the elbow.
* Selection/requirements of the stock tray:  
  -it shouldn’t be   
  -it should be rigid enough to carry the impression material.

-should cover the whole denture bearing area in order to record the landmarks. Not short bucculy or posteriorly.  
-easily modified: if metal we can cut it, if plastic with a flame, if more rigid with the bur.

* Types of the stock tray:

-plastic or metal (solid or perforated). \*perforations: 1.to remove the excess material. 2.for retention.

-disposable trays, with a metal handle that is gas sterilized.

* Selecting the tray size:

1. Try and error: trying the sizes one by one. This method contaminates the whole set.
2. The divider. –upper: from the distobuccal side of maxillary tuberosities. –lower: from the lingual side of the retro molar pad.
3. If we have an existing denture, we measure depending on it.

* The tray should be seated without rocking, supported by the index fingers inside the pt’s mouth and thumbs on the mandible.
* The tray is seated in the patient’s mouth by retracting the cheeks on one side with your index finger and on the other side with the tray itself. And rotate the tray clockwise in the mouth.
* Impression compound: we define it as a thermoplastic rigid impression material. Softened by heat and hardened when cooled.   
  -composition: resins, stearic acid, fillers, and gutta percha.
* Types of impression compound:   
  1. Low fusing compound: green stick compound.  
  2. High fusing compound: cake, disc shaped impression compound.
* pre softening and precautions needed:

1. prepare rubber bowl.
2. gauze 4x4 (prevents sticking of material on bowl).
3. Thin layer or smear of Vaseline on your gloves to prevent the compound from sticking to your hand. if you put a large amount it will slip.
4. Standard heat for impression compound (55-60). Over heating the compound will make it sticky and difficult to handle. The stearic acid will get out into the water giving the compound a whitish color.
5. try not to burn the patient when you put impression so must check it before put in patient mouth on the forearm not palm because palm of hand tolerates high temperatures.
6. Compound can be sterilized by chemical disinfectant for 10 minutes, then it must be put in a plastic bag to prevent cross infection from the clinic to the lab.

* Manipulation of impression compound:

Softened in hot water (55-60C) depending on the manufacturer, for 2-3 minutes, then it should be removed and manipulated until it becomes homogeneous.

* Making the lower impression:  
  there are no rules on taking the upper impression before the lower or vise versa, but scientifically talking it would be better to make the **lower impression first** because:

1. For patients with gag reflex, making the upper impression first will provoke the gagging.
2. The compound and the tray will increase the salivary flow, so it’s better to start with the lower.

* Procedure:

1. Set the patient in the right position: upright position at the level of the shoulder.
2. Roll the compound and spread it on the tray.
3. Make a thin\shallow groove on the center of the compound that simulates the center of the ridge.
4. Test the compound on the forearm then seat it in the patient’s mouth with little pressure.
5. Centralize the tray and apply pressure on the premolar area and let the material flow.
6. Then do the functional movements: lift the cheek upward (to avoid any air trapped between the tray and the material making air bubbles), then downward and rotational movement for the upper. Lift upward and rotational movement in the lower, and ask the patient to move his tongue right and left, and protrude the tongue to bring the palatoglossus muscle forward and ask him to roll the tongue to the palate to make the lingual frenum appear.

* In prosthodontics, don’t work blindly. Look at the anatomy of the mouth and the impression.
* The impression takes 3-4 minutes to set, then you take it out, and the first thing you do is wash it under tap water to remove any debris, salive..etc. then dry it and study it under light.
* If in doubt of anything on the impression, look for it in the patient’s mouth.
* In the lower impression making, we add some material lingually to register the lingual pouch (the area between the palatoglossus muscle and the mylohyoid muscle).
* Some people use the flame to reheat the material.
* **Common faults in the lower denture :**

1. **Insufficient depth in the posterior pouch due to**

* Lack of compound in the tray
* Short flange in this area
* Too little force used while seating the tray
* Tongue trapped by the tray flange due to the patient failure to raise his/her tongue

1. **Insufficient depth in the lingual ,label and buccal sulcui caused by :**

* Lack of impression material
* Slight pressure to seat the tray
* Lack of flow as the material is not soft enough
* Management of 1&2:
* The compound is capable of addition and reheating.
* Correct may be made by adding soften piece of compound to the defective area then reseat and remold the impression

1. **Edge of the tray shows through the impression this may due to:**

* Incorrect centering of the tray
* In the lingual freni region , the forward tongue thrust has been not compensated by backward slight pressure
* Use of too small or too large stock tray. This is why metal trays are not preferred.

1. **Asymmetrical impression due to :**

* More compound on one side than the other
* Failure to center the tray in the patient’s mouth.
* Management: remake the impression.
* Making the upper impression:  
  The soften material should be formed into a ball shape, place it into the center of the tray and spread it out then molded it to simulate the upper ridge without wrinkles , with more material on the periphery to record the full depth of sulucs. The tray should be stabilized by the index finger at the center of the palate if you’re right handed, or the other way around if left handed.you set it first at the most posterior side anteriorly. Then make the patient close his mouth a half closure, to move the coronoid process and prevent it from sliding distobuccaly.
* Remove, wash, dry and read the impression.
* The boundaries shouldn’t be thick or thin.  
  If thick: functional movements not correct.  
  If thin: excess pressure on the palate.
* **Common faults in the upper denture :**

1. Deficiency in the midline of the palate caused by:
   * Insufficient material in the middle..
   * Insufficient pressure
   * Less flow of the component. compound Not soft enough.
2. Excess composition beyond the posterior palatal border caused by:
   * Excessive pressure when seating the tray .
   * Too much material. The esophagus appears in the impression.
3. Impression short in one or more regions “sulci , tuberosity “ caused by:
   * Insufficient material.
   * Failure to mould the peripheral composition.
   * Failure to pull or stretch the cheeks and lip to allow the material to flow into sulcus during functional movements.
   * Insufficient pressure.
   * Compound is not soft enough.
   * Mouth opened too wide so the Coronoid process moved.

* Management: 1+2+3 addition of some compound then re-soften then readapt.

1. Tray shows through the impression due to :

* Poorly selected tray “Too small or large”.
* Incorrect centering of the tray above the center of the ridge.
* Management: remake the impression.
* To avoid cross-infection, the impression should be disinfected by any chemical disinfectant materials and only moved in plastic bag.
* Pouring the cast could be delayed. Because it’s dimensionally stable.
* Advantages, disadvantages, indications of compound and alginate should be revised, and will be included in the exam.

Good luck.