FINAL IMPRESSION TECHNIQUES
Set the patient in upright position.

For mandibular impression the dentist stand in front of the patient.

For maxillary impression the dentist stand behind the patient.
Denture retention relies on a number of factors including developing an adequate border seal around the denture against the soft tissues. This is achieved by extending the denture so that it just begins to displace the movable soft tissues at the periphery of the denture. Obviously such extensions cannot impinge on areas of muscle activity or the denture will be displaced in function. Thus, there is a need to record a dynamic shape of the oral soft tissues.
Objectives

- To shape the border of impression in order to allow the muscles to function in harmony with the denture.
- To improve the border seal of the denture.
Requirements of materials used for border molding

- Should have sufficient strength.
- Should allow some preshaping of the form of the borders.
- Should have a setting time of 3-5 min.
- Should retain adequate flow while seating in the mouth.
- Should not cause excessive displacement of the tissues of the vestibule.
- Should be readily trimmed and shaped so that excess material can be carved and the border shaped before the final impression is made.
Materials used for border molding

- Stick compound.
- Autopolymerizing acrylic resin.
- Polyether impression paste.
- Impression waxes.
- Periopack.
- Tissue conditioners.
Methods

According to manipulation:
1. Manual or digital manipulation.
2. Functional manipulation.
3. Combination of both.

According to technique:
1. Open mouth technique.
2. Closed mouth technique.
4. Incremental border molding.
Manual or digital manipulation
The contour of the denture borders is obtained by the dentist with digital (finger) manipulation of lips and cheeks of patient within functional limits.

Functional manipulation
The contour of the denture borders is obtained by the functional movements provided by the patient.
Open mouth technique
In this technique the tissues are recorded in their undisplaced position. The patient’s mouth is partly opened and tray is held in position.

Closed mouth technique
In this technique the tissues are recorded in their functional and displaced position. The patient applies pressure by closing against occlusion rims or teeth and executes muscle actions such as swallowing, grinning or pursing the lips while the impression material flows.
Incremental technique

- Use stick compound
- Soften over flame by rolling repeatedly to avoid over heating and burning.
• The softened stick compound is flowed along the border of the required segment of the tray.
• The tray is tempered in warm water, placed carefully in patient mouth and necessary movements performed by dentist and patient.
• Clean the tray.
• The borders should be round and smooth with full extension.
Single border molding

Application of the material to the borders of the special tray (all borders) in one time and taking the impression of the borders, poly ether impression material usually used with this method.
FINAL IMPRESSION

techniques
The residual ridge may be said to have two forms:

- **The anatomic form**
The anatomic form is the surface contour of the ridge when it is not supporting an occlusal load.

- **The functional form**
The functional form of the residual ridge is the surface contour of the ridge when it is supporting a functional load.
The ideal residual ridge to support a denture base would consist of cortical bone that covers relatively dense cancellous bone with a broad rounded crest and high vertical slopes, and covered by firm, dense, fibrous connective tissue.
Maxilla
• The crestal area of the residual ridge will become the primary stress-bearing area, consist primarily of cancellous bone, unlike in the mandible, oral tissue that overlies the maxillary residual alveolar bone is usually of a firm, dense nature (similar to the mucosa of the hard palate).

Then the immediate buccal and lingual slopes of the ridge also considered primary stress-bearing area.

Figure 6: Representation of the mucous membrane over the crest of the upper ridge. The submucosal layer is thick enough to provide resiliency for the support of the denture, and the bone is often compact over the crest. Hence the crest is a primary stress-bearing area for an upper denture.
• Palatal tissue between the medial palatal raphae and the lingual slope of the posterior edentulous ridge are readily displaceable and cannot be considered as primary stress-bearing sites. They are considered secondary stress bearing areas.

Figure 8: Histology of the mucous membrane in the postero-lateral part of the hard plate, showing the abundant glandular tissue.

Figure 7: The mucous membrane from the antero-lateral part of the hard palate. The submucosa contains abundant adipose tissue.
• Incisive foramen & median palatal raphe considered as releif areas.

**Figure 9:** The mucous membrane covering the median palatal suture. Note that the submucosal layer is thin or may even be practically non-existent. This means that this area is unsuitable as support for an upper denture.

**Figure 10:** The region near the incisive papilla shows the proximity of the vessels and nerves, requiring that proper relief is provided in this area.

**Figure 11:** The mucous membrane lining the vestibules consists of loose areolar tissue and elastic fibres, thus allowing for the movement of the tissues, and the variation in the form of the sulcus.
mandible

- The buccal shelf region (bounded by the external oblique line and crest of alveolar ridge) seems to be better suited for a primary stress-bearing role, because it is covered by relatively firm, dense, fibrous connective tissue supported by cortical bone.

- Then slopes of the residual ridge also considered primary stress-bearing area.

*Figure 13: Histology of the buccal shelf. In contrast to the crest of the ridge, the bone is compact, thus making this area suitable as primary support for the lower denture.*
The crest of the mandibular residual ridge is considered a secondary stress-bearing area, because the crest of the bony mandibular residual ridge is most often cancellous, and the lining mucosa is not firmly attached, especially in the posterior part.

Figure 12: Histology of the crest of the lower residual ridge. Even though the submucosa may be of adequate thickness, the bone that forms the crest of the ridge is cancellous, and inadequate for primary support for a lower denture.
Also referred as close mouth technique.
Record the tissues in their functional position.
The patient applies pressure by closing against occlusal rims or teeth.
Patient exerts pressure and executes muscle actions.
Close fit special tray with border molding.
Impression compound, waxes, & soft liners.
Displaced soft tissues → unseated denture base.
Pressure → limits normal blood supply → resorption.
Mucostatic technique

- Also referred as open mouth technique.
- Record the tissues in their undisplaced position.
- Dentist exerts pressure.
- Spaced special tray with no border seal.
- Close adaptation of the denture base to the undistorted mucosa.
- Border seal $\rightarrow$ retention.
Selective pressure technique

- Extension for maximum coverage within tissue tolerance.
- Light pressure or intimate contact with the movable loosely attached tissues in the vestibules.
- Minimum pressure.
- Impression compound tray & zinc oxide eugenol paste.
- Special tray (special design) with border refinement.

Selective Pressure Impression Method use those portions of the residual ridge that can withstand additional stress (primary stress bearing area) and at the same time relieve the tissue of the residual ridge that cannot withstand functional loads.
Close fit special tray
- No space between the tray and oral tissue of residual ridge
- No spacer is used
- Used for mucodynamic impression technique

Spaced special tray
- Space between the tray and oral tissue of residual ridge
- Spacer is used (wax)
- Used for mucostatic impression technique
Design of spacer

Mucocompressive technique
- No spacer is used

Mucostatic technique
- Maxilla: full coverage spacer with tissue stops in canine and molar region
- Mandible: full coverage spacer with tissue stops in canine and buccal shelf area

Selective pressure technique
- Maxilla: relief areas (incisive papilla and mid palatine raphe) and over flabby tissues if present.
- Mandible: crest of the ridge
Anatomic land marks
Frenal area

Lip movement near labial frenum is vertical → labial notch long & narrow.

Muscle movements around buccal frenum are horizontal & vertical → buccal frenum wide V shaped. Anterior movement should be recorded by pursing the lips.
- **Buccal vestibular area**
- If border molding in the buccal space is inadequate, the denture will lose its seal because of the ingress of air under the denture base when the buccal vestibule is opened such as during laughing.
Coronoid process

During border molding of the distobuccal border, ask the patient to move the jaw laterally from side to side. Else the coronoid process of the mandible may come into contact during function causing pain or discomfort.
Posterior border area

The hamular notch is favorable landmark for placing the posterior border, which is the most important part for retention of upper denture.

Bases short of the hamular notch will end on the thin - nonflexible – tissue of the tuberosity and will consequently lack retention.

“POSTERIOR EXTENT OF DENTURE IN THIS REGION SHOULD END IN THE HAMULAR NOTCH & NOT EXTEND OVER THE HAMULAR PROCESS AS THIS CAN LEAD TO SEVERE PAIN DURING DENTURE WEAR”
Pterygo-Mandibular Raphe

- Connects from the hamulus to the mylohyoid ridge
- When prominent, can cause pain, or loosening
- Requires relief “groove” if prominent
The vibrating line

an imaginary line across the posterior part of the palate marking the division between the movable and immovable tissues of the soft palate. This can be identified when the movable tissues are functioning.
Significance Of PPS

- Prevents air passage between the tissues and denture base.
- Serves Primarily in denture retention by making contact with anterior portion of soft palate.
- Reduces patients awareness about the area hence decrease gag reflex.
- Prevents food accumulation between posterior border of denture and the soft palate.
- Compensates for polymerization shrinkage of denture base resin.
**Vibrating line**

- The position of *fovea palatine* also influences the position of posterior border of the denture. Denture can extend 1-2mm across it.
- In patients with thick saliva, the fovea palatine should be left uncovered or else thick saliva flowing between the tissue and the denture can increase the hydrostatic pressure and displace the denture.
- It's an imaginary line drawn across the palate that marks the beginning of motion in the soft palate, when the individual says "ah".
- Extends from one hamular notch to the other.
- It passes about 2mm in front of the fovea palatine.
- This line should lie on the soft palate.
- Distal end of the denture must cover the tuberosities and extend into hamular notches. It should end 1-2mm posterior to the vibrating line.
Anterior Vibrating Line:

“ Its an imaginary line lying at the junction between the immovable tissues over the hard palate and slightly movable tissues of the soft palate ”

- The anterior vibrating line is cupid bow shaped due to projection of posterior nasal spine.
- It can be located by asking the patient to perform the “valsalva” maneuver.

Posterior Vibrating Line:

“ Its an imaginary line at the junction of the aponeurosis of tensor veli palati muscles and muscular portion of soft palate ”

- This line is usually straight.
- Its recorded by asking the patient to say “ah” in short but normal non-vigorous fashion.
1- Conventional Tech:
By using special tray
By using impression
3- **Arbitrary Scrapping Of The Master Cast:**

- Ant. & post. Vibrating lines are visualized by examining the pt’s mouth and approximately marked on master cast.
- The lab technician scraped 0.5 to 1mm of stone in posterior palatal seal area of the master cast and fabricates the denture.
- This technique is inaccurate and not physiological and should be avoided.
Buccal flange area

**Buccal shelf**, it is bounded medially by the alveolar crest, anteriorly by the buccal frenum, laterally by external oblique ridge and distally by the retromolar pad.

The buccal shelf is covered with dense cortical bone and is also a wide area lying perpendicular to the direction of occlusal forces so it considered primary support bearing area in the mandibular arch.

**External oblique ridge**, a bony ridge outsides the buccal shelf, runs anteroposteriorly. The denture border extend 1-2 mm beyond it.
If the denture border is extended beyond the external oblique ridge, the denture base will cover the buccinator muscle fibers. However, the lower muscle bundle is loose and in active, it will not dislodge the denture.

The muscle fibers run anteroposteriorly, paralleling the denture border and function in horizontal direction.

If the denture border under extended in this area, it leads to food accumulation in the buccal sulcus and under the denture base.
- Buccal frenum
- Clearance in this area should be provided for the normal action of the frenum.
- **Mylohyoid ridge area**
- A denture border short of the mylohyoid ridges digs into the residual ridge and causes pain. If shortened, the denture border will impinge again upon the ridge.
- Border molding of the mylohyoid ridge area should be performed 4-6 mm below this ridge. Later the impression surface of the denture on the mylohyoid ridge area is relived.
- As the mylohyoid muscle runs anteroinferiorly even when it contracts maximally, it allows extension of the denture beyond the mylohyoid ridges.
Residual Ridge Resorption (RRR)

Mucosa in this region is poorly keratinized and prone to trauma.

Mylohyoid ridge can cause ulcers if it is a sharp.
- **Retromolar pad area**
- The denture must cover 2/3 of the retromolar pads.
- It is composed of a firm fibrous connective tissue papilla in its anterior half and soft tissue containing molar glands in the posterior half.
- The position of the pads remains constant, even after the natural teeth are extracted. As the temporalis muscle fibers attach to the distal portion of the retromolar pad, stimulation from this muscle prevents the pad from resorbing.
- These facts ensure that the pads are an excellent guide for determining and setting the plane of occlusion between upper and lower denture teeth.
- The pads serve as bilateral, distal support for a mandibular denture. Covering the pads with the denture base helps reduce the rate of alveolar ridge resorption.
**Retromylohyoid fossa**

- It is space distal to mylohyoid muscle. Bounded by the mylohyoid muscle anteriorly, retromolar pad laterally, the superior constrictor muscle posterolaterally, the palatoglossus muscle posteromedially, & the tongue medially.

- During border molding, the border in this area is pushed into the retromylohyoid fossa by the strong intrinsic & extrinsic tongue muscles

- Thus it will show the so-called S curve as viewed from impression surface.
- **Sub lingual gland area**
  - Sub lingual gland lies above the mylohyoid muscle & is raised by the muscle during swallowing.
  - If the denture border made short to relieve the raised sublingual gland, a space will occur between the denture border & the mucosa when the muscle is at rest & thus peripheral seal will be lost.
  - The sublingual gland serves as a cushion, so neither lifts the denture nor causes the mucosa to be traumatized by the denture.
Anterior lingual flange area

The border of the impression in this area is mainly influenced by the lingual frenum & the genioglossus muscle.

To provide adequate clearance in this area the patient is instructed to lick the lower lip by moving tip of the tongue from side to side.
- **Labial flange area**
- When the lip is pulled too much during border molding, the vestibule becomes shallow as the mentalis muscle attachment is higher than the base of the labial vestibule.
- On biting the operator fingers, the masticatory muscles become tense and the lips become relaxed as a reflex, then the impression is made in this situation.
Impression procedure for flabby ridge

Objectives

- Impression of the flabby area made with pressure free technique.
- Impression of the sound edentulous arch that can withstand the occlusal load made with pressure technique.
Final impression of ridge flabby in all areas

- Flabby ridge
- Wax spacer
- Spaced special tray
- Final impression with impression plaster
Final impression of ridge flabby in anterior region

Flabby anterior ridge

A window is made in special tray

Border molding of the special tray
Final impression of the entire ridge except the flabby ridge with ZOE

Final impression of the anterior flabby ridge with impression plaster without pressure
a. incisive papilla
b. palatal rugae
c. median palatine raphe
d. maxillary tuberosity
e. pterygomaxillary notch
f. fovea palatini and vibrating line area
i. residual alveolar ridge
j. buccal frenum
k. labial frenum
a. retromolar pad  
b. mylohyoid (internal oblique line)  
c. masseteric notch  
d. residual alveolar ridge  
e. lingual frenum  
f. external oblique line  
g. buccal frenum  
h. labial frenum