Trial denture for removable complete denture

Trail denture: a preliminary arrangement of artificial teeth that has been prepared for placement into the patient's mouth to evaluate esthetics, phonetics, and maxillomandibular relationships.

Trial base: an interim material or device representing the base of a removable denture or maxillofacial prosthesis; used for making maxillomandibular relationship records and for the waxing of the trial denture.

Trial placement: the process of placing a trial denture in the patient's mouth for evaluation.

Importance of trial denture

1. It is the last opportunity to evaluate many of the previous steps already accomplished.
2. Permits the patient to assess the appearance of the denture.
3. Identification and correction of any errors before the dentures are finished.

Objective of try-in procedure

1. To verify the maxillomandibular records which were made without teeth
    a) To check for acceptance of established vertical dimension.
    b) Verify that centric occlusion and centric relation coincide.
2. To determine the position of teeth and denture base are compatible with surrounding oral tissues.
3. To evaluate tooth selection and arrangement for esthetic requirement.
4. To make additional interocclusal maxillomandibular records if needed for further adjustment of the articulator e.g. protrusive interocclusal record.

Aspects of Try-In stage

a. Extra oral examination on articulator which include the accuracy of the cast, denture base, teeth and their relation.
b. Intra oral examination which include check the trail denture separately and together inside the patient mouth.

A- Extraoral examination of the trial dentures

The master Cast

- As the finished denture is processed on the master cast. So the master cast should be:
  a. good shape.
  b. Free from air bubbles or scratches.
  c. Free from wax debris which lead to improper adaptation of the trail denture bases leading to false relationships.
  d. If there are any undercuts present in the cast, these undercut should be relieved to avoid scratching of the cast by the trail denture bases.

The trial denture bases

- Check the following:
  1. The trial denture bases must be stable.
  2. The borders of the trial denture base should be smooth, round, and have no sharp edges.
  3. Also the border should be shaped to conform to the depth and width of the sulci.

On the articulators

- The mounted cast is checked for:
  a) Maintaining of the vertical dimension of occlusion
     1. Top of the incisal pin is flush with the upper member of the articulator.
     2. The incisal pin is in contact with the incisal table.
  b) The mounting rings are firmly screwed in their position.
  c) Moving of the articulator smoothly from centric to eccentric position without cuspal interlocking.
  d) The trial denture bases lie properly on their casts and the teeth meet evenly in centric relation.

The teeth

1. It is the dentist responsibility to select the proper shade, and shape of the teeth and determine that the teeth are set correctly.
2. Elimination of the excess wax is done to avoid the false teeth relationships or overlook the occlusion.
3. The relation of both upper and lower teeth to the opposing ridges must be checked: if there is excessive anterior tooth contact on the articulator,

should be corrected to avoid the excessive forces on the maxillary anterior ridge which causing bone destruction in that area that is already a target for bone loss.

4. Denture occlusion:

The occlusion of the teeth in on the articulator should meet the following in the class I jaw relationship:

- The upper anterior teeth overlap the lower anterior teeth by about 1-2mm, in both horizontal and vertical planes.

B-Trial denture assessment in the mouth

- The denture should be assessed individually for:
  1. Physical retention
  2. Stability
  3. Extension of denture bases
  4. Relationship to the neutral zone
- The denture should than be assessed together for:
  1. VD
  2. CR position
  3. Esthetic
  4. Phonetics
- Establishment of the posterior palatal seal.

Physical retention

If the prognosis for retention in the upper jaw is good, dislodgement should be expected to be difficult. In the case of the lower denture, retention is often poor because of the relatively small denture-bearing area and the difficulty in obtaining an efficient border seal.

It is noted that the retention of the trial denture is less than that of completed denture, due to:

a. Absence of a posterior palatal seal.
b. Poor adaptation of the trial denture base to the tissues.

The trial denture should stay in position when the mouth is opened. Looseness of the upper trial denture makes it impossible to carry out an accurate assessment of the occlusion {may use denture fixative} especially, in patients with unfavorable anatomical factors.

- Loss of retention may be include absence of a border seal resulting from:

1. Under-extension.

2. Inadequate width of flange.
3. Ineffective seal at the posterior border.
4. Poor fit of the denture base.

Stability

It is tested by applying pressure in a tissue ward direction with the ball of the index finger in the premolar and molar regions on each side alternately.

This pressure must be directed at right angles to the occlusal surface where displacement does occur.

Causes of instability

1. Warpage of the denture base.
2. Posterior teeth set buccal to the underlying alveolar ridge
3. Hard unrelieved area in the midline e.g. torus palatinus.

Extension of denture bases

The accuracy with which the denture borders conform to the depth and width of the sulci must be determined.

a. The posterior border of the upper trial denture base should extend from the hamular notch of the other along the vibrating line of the soft palate.
b. The lower denture should cover the retro molar pad to buttress the denture against the backward pressure of the lower lip.

If marked over-extension of the denture flanges is present, stretching of the sulcus tissues will occur when the denture is inserted into the mouth and their subsequent elastic recoil will cause dislodgement of the denture. Therefore, if the denture is displaced immediately after being seated, over-extension should
be suspected.

The presence of under-extension is determined primarily by intra-oral examination, when the depth of the sulcus will be seen to be greater than that of the denture flange. Correction of any under-extension will usually entail taking a new impression in the trial denture. Failure to do this will result in reduced physical retention of the finished dentures and inadequate distribution of load to the tissues.

Relationship to the neutral zone

The positioning of teeth in the neutral zone is of particular importance in the case of the lower denture because the physical retention is relatively weak. Identification of the neutral zone will have been attempted while shaping the record block at the earlier visit and now the trial denture must be checked to see if that assessment was correct and has been transferred accurately to the denture. When the lower denture is inserted, it should remain in place when the mouth is half open and the tongue is positioned so that its tip lies just behind
the lower anterior teeth.

Assessment of denture together intraorally

Vertical dimension of occlusion

The vertical dimension of occlusion and rest must be evaluated because the final position of the anterior and posterior teeth will depend on the amount of space available vertically. The factors that govern the final determination of vertical relation depends on careful consideration of the following:

1. Occlusion: compare to previous VDO at two skin points.
2. Upper/lower teeth and gingival visibility.
3. Facial profile and proportions mid/lower face.
4. Relaxed facial posture.
5. Interarch space with breathing, swallowing, speaking.
6. Patient perception of jaw position.

Correction of the occlusal vertical dimension

Occlusal vertical dimension too small

When the freeway space is too large, it is corrected by adding the appropriate thickness of wax to the occlusal surfaces of the posterior teeth on one of the dentures, adjusting the wax to produce an even occlusion at the desired occlusal vertical dimension and then re-recording the jaw relationship in the retruded contact position**.**

Occlusal vertical dimension too large

When the freeway space is too small, or absent altogether, teeth will have to be removed from one of the dentures and be replaced with a wax rim before the new recording can be made.

Evaluation of centric jaw relation

Intra Oral Observation of Intercuspation

Patient is guided into CR by a thumb placed on the anteroinferior portion of the chin and index finger bilaterally on the buccal flanges of the lower denture.
Any Error in CR will be apparent when teeth slide over each other.

Extra oral articulator method

Process:

1. Impression material (e.g. Aluwax) is placed over mandibular posterior teeth.
2. wax sealed – denture placed in mouth – just wax portion is immersed in water bath of 130oF for 30 secs – denture placed back in pts mouth - mandible guided into CR so that upper teeth makes contact with the wax – denture removed & chilled in ice water & returned back to patients mouth for re-checking.
3. CR is confirmed – Trial dentures are then locked in articulator – opposing teeth should fit in the indentation in every way (anteriorly, posteriorly, laterally & vertically) if the original CR was correct.
4. If it does not fit, mandibular cast should be separated & remounted with last occlusal record.
5. The new mounting is again checked to prove or disprove its correctness.
6. Do not remount the upper cast because the face-bow transfer will be destroyed.

Esthetic evaluation of trial denture:

1. Central or midline: stand in front of the patient some distance away, a wrong center line will be obvious, but if in doubt any aids can be used like dropping an imaginary line from the midpoint on the inter-pupillary line, the contact area between the two central incisors should coincide with this line.
2. Anterior plane: this may be observed from some distance away from the patient, and any tendency for this plane to slope markedly up or down should be noted and corrected.
3. Size, form and shade of teeth: the size of six upper anterior teeth should approximately the width between the corners of the mouth. The form should be in harmony with the face form, but not necessarily identical with the outline of the face. The color of the teeth should blend with the face so the teeth do not become the main focal point of the face. The concept of the influence of sex, age and personality must be considered when developing harmony among teeth form, arrangement and the patient.
4. Lip support and profile: the upper lip should be adequately and properly supported by the upper anterior teeth. The labial surfaces of central incisors will be about 8-10 mm in front of the middle of incisive papilla. The

further the papilla is located labially, the greater the maxillary ridge resorption and the further the anterior teeth must be positioned. In many instances the inclination of anterior teeth is similar to that of the profile of the face.

5. Amount of tooth visible: the amount of upper anterior teeth seen during speech and facial expression depend on the length of upper lip. In long lip no teeth are visible, the teeth are shown in smiling only. While in short lip, full crown may be visible below the upper lip even at rest. On smiling, large amount of denture base in addition to teeth are visible. For the lower teeth must be leveled with the corner of the mouth when the patient opens slightly.
6. Regularity of teeth: few natural teeth exhibit perfection, and to perfect a set up in the incisor region especially in persons of middle age, try to avoid that the teeth looks artificial. Therefore, a little irregularity is usually desirable like rotating and overlapping the teeth to give an irregular appearance.
7. Harmony of the incisal edge of maxillary anterior teeth with smiling line of lower lip: usually the incisal plane of maxillary anterior teeth follows the contour of the lower lip during smiling.
8. Buccal corridor: usually a buccal corridor should be evident between the teeth and cheek. Wide upper arch cause crowding appearance and obliterating of corridor, while narrow upper arch causes an increase in the buccal corridor which looks like a dark space between teeth and cheek.

Evaluation of the phonetics

Labiodental sounds (f, v)

- F&v are between the upper incisors and the posterior one third of the lower lip.
- Affected by the anteroposterior position of upper anterior teeth and their length.
- If upper anterior short, v sound will be more like an f.
- If upper anterior long, f sound will be more like v.

Linguoalveolar sound <u>(t, z, s,d,v,l,ch,sh)</u>

During pronunciation of sibilants like “z, s, ch”, teeth will come close together but do not touch. Silverman’s closest speaking space is used for determining proper vertical dimension. Clattering of teeth indicates excess vertical height. “S” resembles “Sh” or whistling sound when there is insufficient degree of jaw separation.

Bilabial sounds (p,b ,m)

“P”, “B”, “M” help in determining the correct degree of jaw separation. When the vertical dimension is too high, the patient will not be able to purse his lips together and consequently the articulation of these sounds may be distorted.

Incorporation of posterior palatal seal area

The patient is asked to keep the mouth open and say ‘ah’. A two lines are drawn with indelible pencil in the patient’s mouth across the palate extending from one hamular notch to the other that the detect the anterior and posterior vibrating line. The trial base is inserted into the patient’s mouth so that the indelible markings are transferred to the trial base. The trial base is seated on the master cast to transfer the markings marked in the patient’s mouth to the cast. The area between the anterior and posterior vibrating line is scraped in the master cast to a depth of 1 to 1.5 mm on either side of the mid palatine raphe. In the region of the mid-palatine raphe, it should be only 0.5 to 1mm in depth.

Patient’s role in trial denture

1. To record their wishes and expectations.
2. The patient agreement of any alteration in form from the previous dentures.
3. The patient, and any accompanying person, should agree on the acceptability of the trial dentures and that the patient is happy to proceed to completion.

Technician’s role in trial denture

1. To have replicated the registration records faithfully.
2. To place teeth according to prosthodontic norms.
3. To provide stable bases.
4. To ensure that balanced occlusion/articulation is provided, according to the prescription by the clinician.

5. To have articulated casts appropriately and to have set condylar angles to any prescription given.
6. To ensure waxwork is complementary to the age and personality of the patient.