

Single complete denture

The prevalence of the condition where one edentulous arch opposes a natural or restored dentition is quite common. It has been estimated that for some patient populations the mandibular canines are retained four times longer than other teeth followed by the mandibular incisors. This documented arch discrepancy in tooth survival suggest that the maxillary arch exhibits earlier tooth loss, the reasons for the loss of the maxillary teeth prior to the mandibular teeth is unclear and are influenced by a combination of factors, one major factor might be the professions perception of the ease of construction of maxillary dentures compared with mandibular ones and comparative functional success of maxillary versus mandibular complete dentures.

Among the reasons for this occurrence is that a maxillary complete denture is more stable, easier to retain in position and tolerated better by patients than a mandibular denture, therefore many are less reluctant to allow the loss of the maxillary teeth and at times insist upon their removal.

Single Complete Denture

It is a complete denture that occludes against some or all of the natural teeth, a fixed restoration, or a previously constructed removable partial denture or a complete denture.

The construction of a single denture may be presented in a variety of dental combinations. It could be:

1- Single complete denture opposing natural teeth which either:

- a) Upper complete opposing by complete mandibular dentition
- b) Upper complete opposing by mandibular partial denture
- c) Lower complete opposing by upper partial denture
- d) Lower complete opposing by complete maxillary dentition

2- Single complete denture opposing previously constructed complete denture

Single complete dentures making is more complicated than the conventional upper and lower complete denture procedure. The reasons for this:

1. The ability of the patient to generate heavy occlusal forces, due to the existence of opposing natural teeth.
2. The high occlusal forces from the opposing natural teeth, results in advanced bone loss of the residual alveolar ridge.
3. supra-eruption of the opposing natural teeth produces an unharmonious occlusal plane and minimizes the vertical space for setting the opposing denture teeth.
4. Mesial drifting of the opposing natural teeth results in an increased mesial axial angulation (tilting) which produce an unharmonious occlusal plane.
5. Esthetic problems due to the fixed position of the mandibular teeth.
6. Abrasion of the artificial teeth if acrylic is used or the abrasion of the natural teeth if porcelain is used.
7. Increase the tendency of fracture of maxillary denture due to occlusal stresses exerted by natural teeth.

In these situations, it is necessary to consider the to all patient, three factors in particular must be carefully evaluated,

1. Preservation of the residual alveolar ridge.
2. Necessity for retaining opposing teeth and
3. Mental trauma.

Maxillary complete opposing by complete mandibular dentition

- A gross occlusal discrepancy are very common and require occlusal modification, adjustment or orthodontic.
- Morphology of natural teeth which determine selection of artificial teeth .Ex size& shape.
- If mandibular teeth are attrition 0, cusplless teeth are preferred.
- If mandibular teeth are not attrition, anatomic teeth are preferred.

Occlusal modification:

Occlusal modification of remaining natural teeth is usually required prior to construction of single complete denture .It is a pre prosthetic procedure where occlusal discrepancy present in natural teeth are corrected.

Several techniques used for occlusal modifications prior to denture construction:

1- (Yurkstas technique): Use of a commercially available U shaped metal occlusal template that is slightly convex on the lower surface. This template is often an aid in detecting minor deviations in the occlusal scheme

2- (Swenson's technique): Upper and lower casts are mounted on the articulator. The upper denture is constructed. If the lower natural teeth interfere with the placement of the denture teeth, they are adjusted on the cast and the area is marked with a pencil. The natural teeth are then modified using the marked diagnostic cast as a guide. It is simple but time consuming.

3- (Bruce technique): Use of a clear acrylic resin template fabricated over the modified stone cast. The inner surface of the template is coated with pressure indicating paste and placed over the patient's natural teeth.

4- Boucher Technique: The interferences are removed by movement of the maxillary porcelain teeth over the mandibular stone teeth. Pre-maturities are identified and removed by grinding the natural teeth. The procedure is repeated for right and lateral excursions until a harmonious balanced occlusion is established.



Upper complete opposing by mandibular partial denture

The most frequent encountered situation for a single complete denture is opposite a partially edentulous arch in which the missing teeth have been or will be replaced with a RPD.

Complications: a) Combination syndrome b) Fracture of denture c) Wear of natural teeth

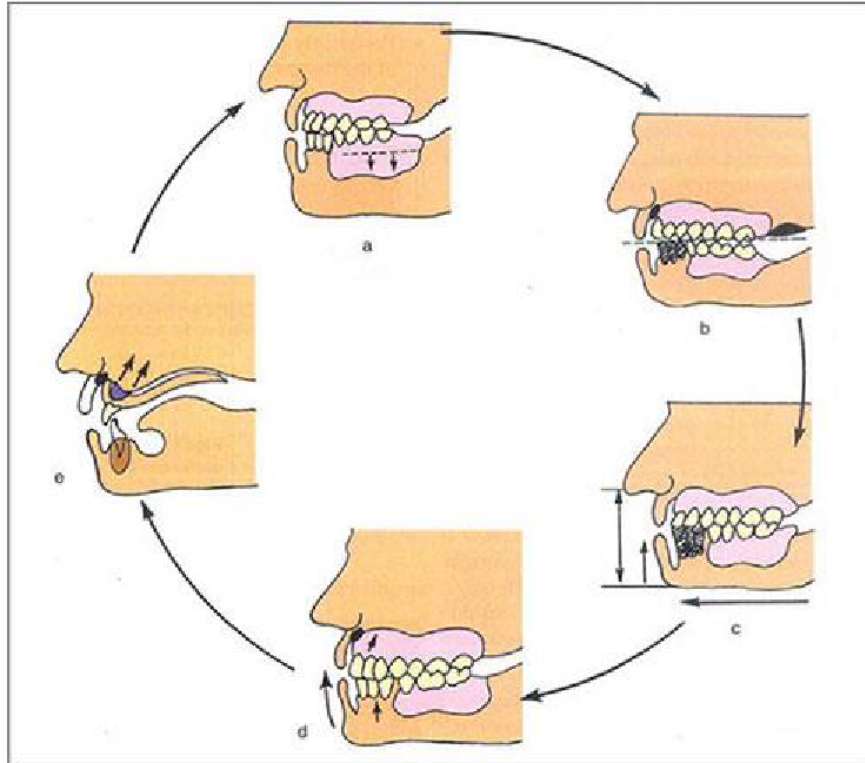
A. Combination Syndrome by Kelly (1972): destructive problems, which may be encountered as a result of long term use of a mandibular distal extension partial denture against a complete maxillary denture, also named Anterior Hyperfunction Syndrome.

Sequence 1:-

- The patient will tend to concentrate the occlusal load on the remaining natural teeth for proprioception. Hence more force acting on the anterior portion of the maxillary denture.
- This leads to increased resorption of anterior part of maxilla which gets replaced by flabby tissue. The occlusal plane gets tilted anteriorly upwards and posteriorly downwards due to lacks of anterior support.
- The labial flange will displace and irritate the labial vestibule leading to the formation of epulis fissuratum.
- Posteriorly there will be fibrous over growth of the tissue in the maxillary tuberosity.
- The shift of the occlusal plane posteriorly down ward produced resorption in the mandibular distal extension denture bearing area.
- Due to the tilt of occlusal plane shift anteriorly during occlusion. The vertical dimension decreased. The retention and stability of the denture is also decreased.
- The tilt of occlusal plane disoccludes lower anterior causing them to super-erupt this reduces the periodontal support of the anterior teeth.
- The shift of the occlusal posteriorly down ward produces resorption in the mandibular distal extension denture bearing area.
- Due to the tilt of occlusal plane disoccludes the mandible shift anteriorly during occlusion.
- The supra erupted anteriors increase the amount of force acting on the anterior part of the complete denture and the vicious cycle continues.

Sequence 2:

- There is gradual resorption of the distal extension residual ridge in the mandible.
- This leads to tilting of the occlusal plane posteriorly downwards and anteriorly upwards
- Rest of vicious cycle continues as shown in figure

**This syndrome consists of:**

1. Loss of bone from the maxillary anterior edentulous ridge
2. Down growth of the maxillary tuberosities
3. Papillary hyperplasia of the tissues of the hard palate.
4. Extrusion of the lower anterior teeth
5. Loss of bone beneath the removable partial denture bases.

It usually has six associated changes:

1. Loss of vertical dimension of occlusion.
2. Occlusal plane discrepancy.
3. Anterior spatial resorption of the maxilla.
4. Development of epulis fissuratum.
5. Poor adaptation of the prosthesis.
6. Periodontal changes.

The combination syndrome is a result of three main factors

- The great magnitude of forces involved.
- The unsuitability of the denture foundation to resist them.
- The particularly unfavorable occlusal relationship.

B. fracture of Denture:

It is a common case with single complete .This is because the denture will receive excessive load from the natural teeth.

The precipitating factors which produce denture fracture.

- Excessive anterior occlusal load.
- Deep labial frenal notches.
- High occlusal load due to excessive action of the masseter.

Precaution checking for the occlusion

- a) Maintain adequate thickness of denture base.
- b) Never deepen the labial notch.
- c) For cases with high fracture potential, use a cast metal denture base.

C. Wear of Teeth: when porcelain teeth are used, severe abrasion of opposing natural teeth will occur, hence, a proper selection of teeth material is very important. Care should be taken to avoid any occlusal discrepancy.

Setting of teeth and occlusal concept

Selecting occlusal concept depends on the occlusal anatomy of the opposing natural teeth:

- Opposing teeth anatomic then balanced occlusion is used.
- Opposing teeth are attrition then monoplane occlusion is used.

Types of teeth

- Porcelain teeth (problem): they cause rapid wear of opposing natural teeth and the occlusal vertical dimension is maintained.
- Acrylic teeth (problem): No wear of the opposing natural teeth, they are the teeth of choice. The major disadvantage of resin teeth is their wear, which results in loss of vertical dimension.
- Acrylic with gold occlusal surface: In patients with the financial resources, gold occlusal can be used to minimize wear of the occlusal surfaces. Although gold occlusal are considered the best material to oppose natural teeth, BUT they are expensive and need time in their fabrication.
- Acrylic with amalgam stops: In patients with limited financial resources, amalgam stops can be inserted into the cusp tips of the acrylic resin denture teeth reduce the occlusal wear, and the technique is simple less time consuming and less expensive than with the gold occlusal.

These dentures are very significant due their complications, teeth selection is very important in fabrication of denture. so selection of teeth based on the following:--

1. If opposing partial denture has porcelain teeth, porcelain teeth are preferred
2. If opposing natural teeth have gold or metal crown, then acrylic teeth preferred.
3. Acrylic teeth are preferred in denture opposing normal natural teeth or partial denture with artificial acrylic teeth.

Mandibular single denture:

The prognosis of a mandibular single denture against natural teeth is less favorable than when the full upper denture is opposed by natural lower teeth. It would be difficult to classify this case as clinically successful. This is due to:

1. Excessive resorption of lower ridge due to greater stresses per unit area delivered to the mandibular ridge by the natural teeth.
2. Amount of firmly attached mucosa to denture.
3. Denture bearing area in mandible less than maxilla.

The alternative line of treatment plane for such patient could be either:

- It can be best treated with dental implant if possible
- Use of resilient denture liner in the mandibular denture.

Problems of single denture: (Mandibular single denture have very poor prognosis)

1. Greater magnitude of forces and changes in the underlying bone, in the long term, denture will be compromised
2. Occlusal form of the remaining natural teeth: This occlusal form dictates occlusal form of the denture teeth which might be unsuitable for the denture.
3. Occlusal scheme causing more horizontal forces

These factors cause occurrence of:

- A. Single denture syndrome.
- B. Loose or tilting denture.
- C. Damage of mucosa.
- D. Ridge resorption.

- How to overcome these problems?????????

- The primary consideration for a continued success of a single complete denture is the preservation of that which remains.

- All fundamental steps in denture construction must be followed and completed to perfection(without minor errors).
- The occlusal plane of the natural teeth in the opposing arch must be made harmonious.
- Maximum base extension within functional anatomical limits (distributed forces over the largest possible area of supporting structures and the force per unit area kept at minimum.)
- Reduction of the forces to which the denture is subjected:
 - 1- Reducing bucco-lingual width of posterior teeth.
 - 2- Maximum tissue coverage.
 - 3- Balanced harmonious occlusion.
 - 4- Use of resilient denture liner in the mandibular denture.
 - 5- Use of implant supported fixed or overdenture prosthesis.
 - 6- Skeletal class III (Mandible larger than maxilla).
 - 7- Extraction of remaining teeth and complete denture are constructed

Prevention of syndrome

1. Try and retain weak posterior teeth by means of endodontic, periodontal therapies.
2. Using lower anterior roots and giving overdenture.
3. Giving bilateral balanced occlusion.

Management of combination syndrome

- ✓ Diagnosis of cause and its correction.
- ✓ Use of tissue conditioners
- ✓ Surgical correction of changes in basal seat flabby tissues, papillary hyperplasia, enlarged tuberosities.
- ✓ Restorative treatment of remeaning teeth

Steps for Single Denture construction

- 1) Proper **Diagnosis** and mounting the diagnostic casts for evaluation of
 - a. Ridge relationship
 - b. Interdental space
 - c. Occlusal plane
 - d. Spaces
 - e. Tooth position(Cusp inclination &Rotations)
 - f. Tooth wear:-With single complete dentures, the natural dentition opposing the edentulated arch often exhibits an uneven occlusal plane and tilted teeth.
- 2) **Occlusal adjustment** and tooth modification: common severely inclined mesially molar, if left unaltered would be no occlusion in protrusive and lateral excursions except for contact on the distal half of the lower molar.

Treatment: a) If the molars are not severely tilted they may be reshaped by selective grinding.

b) Restore the tilted molars with cast gold crowns, onlays, or a fixed bridge if a large edentulous space exists mesial to the molars.

c) If a large space does exist mesial to the tilted molars, alternative treatment is to design a removable partial denture restore the mesial half of the molars by using an onlay mesial rest.

d) If the molars are severely tilted, extraction is necessary.

3) **Final Impression:** In cases of flabby or mobile tissues is diagnosed; selective pressure or minimum pressure or even non pressure impression technique used in the final impression.

First model: 1. The places with flabby mucosa were delineated &as well the places on the "medaina palatine raphe" &" torus palatinus".

2. Those spots were then covered with a wax layer.

3. After that an individual tray is formed.

4. Holes are drilled at the places corresponding to the critical spots mentioned earlier with a space approximately 5mm apart.

Second model: You can follow same steps in the 1st model but instead of putting holes you prepare a window at the delineated areas of flabby tissues. You must use an impression material making. Plaster of Paris impression materials is mostly the material of choice. It can be applied in a layers with a brush to produce the desired need. Silicon light body alone or in combination with regular body can be used in a proper material handling.

Third model:

1. On this model the areas of movable- flabby tissues are delineated as well as the areas need relief as the torus palatinus-if present.
 2. Then relieved with a layer of wax in a uniform thickness.
 3. Another base plate wax covered the whole basal seat i.e. the surface outlined for tray.
 4. Wax is cut away in locations where stops are desired; usually we place them in the areas opposed to the canines & 1st molars.
 5. The tray is completed with the wax spacer as relief.
 6. Holes are drilled at the places corresponding to the flabby tissues areas & torus palatinus. The materials used in final impression is either single type with light consistency & good flow or you may use more than one type-combination- depending on the stress bearing & relief areas.
- 4) **Jaw relation:** A face bow registration is made & a cast mounting must be either by using an average value articulator or using semi adjustable articulator that indicates a protrusive relation record.

Recording vertical jaw relation may be interfered with the over erupted or malposed teeth; these may require some modification in the bite rim orientation but this must be made in a local areas without- as possible- interference with the proper orientation of occlusal plane and freeing the anterior occlusion rim.

- 6) Artificial teeth adjustment and **Try-in** of waxed denture.
- 7) **Delivery.**