Single complete denture

It is a CD maxillary or mandibular may be fabricated to opposed by:

1. An arch containing a sufficient number of natural teeth and fixed restorations so as to not require any other prosthesis.
2. A partially edentulous arch in which the missing teeth have been or will be replaced by a removable partial denture, fixed partial dentures, or implant-supported prostheses.
3. An existing acceptable complete denture, whether it be mucosal-borne, tooth-supported, or implant-supported; the patient may ask for a new single complete denture construction.

Therefore, the conditions leading to the recommendation of treatment by means of a single complete denture can be quite varied.

Glossary of prosthodontics termed this case as a **combination syndrome by Kelly 1972 (Kelly's Syndrome)** which is a destructive problems may be encountered as a result of long term use of a mandibular distal extension partial denture against complete denture: **This syndrome consist of:-**

1. loss of bone from the anterior portion of the maxillary ridge.
2. Overgrowth of the tuberosities.
3. Papillary hyperplasia of the hard palate's mucosa.
4. Extrusion of the lower anterior teeth.
5. Loss of alveolar bone &ridge height beneath the mandibular removable 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:

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

The characteristic features (pathogenses)

Sequence 1:

- The patient will tend to concentrate the occlusal load on the remaining natural teeth (mandibular anterior) for proprioception. So there is more force acting on the anterior portion of the maxillary denture.
- This sequence was trigged due to a negative pressure within the maxillary denture, which causes the anterior ridge to be driven upward by the anterior occlusion, followed by an early loss of bone from the anterior part of the maxilla 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 in the maxillary sulcus.
- This is followed by maxillary tuberosity hypertrophy.
- The shift in the occlusal plane posteriorly downwards produce posterior mandibular resorption in the distal extension denture bearing area, the mandible moves forward, causing a relative (pseudo) mandibular prognathism.
- Due to the tilt of occlusal plane anteriorly upwards during occlusion, the vertical dimension decreased, the retention and stability of the denture also decreased.
- The tilt of the occlusal plane disoccludes lower anterior teeth causing them to super erupt, this will lead to reduction in the periodontal support of them.

- The super eruption of the lower anterior teeth will increase the amount of force acting on the anterior part of the CD and the vicious cycle continues.

Sequence 2:

- There is gradual posterior mandibular resorption in distal extension residual ridge.
- This lead to tilting of occlusal plane posteriorly downwards &anteriorly upwards.
- This cycle will continue.

For such patients; the clinical challenge is one of appreciating the differences in the supporting tissue in the two arches &applying the appropriate management procedures to preserve the remaining tissues as well as restore missing structures to preserve the remaining structures to optimize the functional &esthetic requirements.

The qualitative &quantitative differences between the natural teeth &CD in support is demonstrated by the ability of the natural teeth to respond well to the physiological limits of the occlusal load in a way help to maintain functional &preservation requirements; while the mucoperiosteal supported denture is incapable to adapt such a condition in same level with the natural teeth.

Jaw relationship extreme:

This makes it difficult to place the denture teeth in a position that allows the denture bearing area to be in line with occlusal support; as in CL.III skeletal relationship. This result in cross bite posterior teeth arrangement while anterior teeth cannot be set lingual to the lower anterior teeth &the risk foe denture dislodgement with anterior tooth contact is problematic.

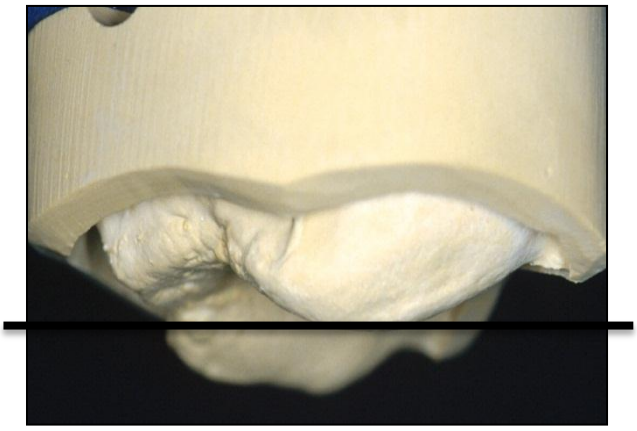
Excessive displaceable denture bearing tissues:-

In denture; the forces of occlusion are resisted by mucoperiosteum which allows some movement of the denture base by its resiliency. When tissue displacement allow excessive displacement in one area but not in another; the movement of the prosthesis

under load is greater in the region of greater tissue displacement with resultant dislodgement.

Irregular occlusal plane:

This is often is seen as a tilting or extrusion of teeth after the extraction of a mandibular first molar the 2nd &3rd molars are inclined anteriorly; this lead to a superior position occlusal plane than normal. This result in an irregular occlusal plane &consequently unfavorable force distribution. This indicated the need for selective grinding, with a template placed on the dental arch. The device will rest on the most prominent teeth to ensure enough number of teeth are in contact. This provides a uniform reduction but may not meet the need of a specific denture arrangement for stable cross arch balance. A frequent obstacle to obtaining a balanced occlusion is an irregular occlusal plane of the teeth in the opposing arch, as a result of supra-eruption or tilting of teeth. A consequence of this irregular plane is an unfavorable distribution of forces. The irregular occlusal plane may also compromise the final esthetic outcome of the single denture.



Clinical and laboratory steps:-

Preprosthetic work:-

Different patients with particular clinical findings should be treated specifically to prosthodontically rehabilitate them and prevent combination syndrome. Therefore consider the following individually (it is not essential to have all the complications in every patients).

- Treatment of the abused tissues by using tissue conditioners, occlusal adjustment& extension correction of the existed denture; you may ask the patient not to wear old denture. Surgical correction may be needed according to the extension &severity.

- Reduction enlarged tuberosities; surgically to allow the lower RPD occlusion to oriented properly in relation to the retromolar pad area &buccal shelf area.
- Splinting the remaining mandibular anterior teeth to provide the RPD with positive occlusal support, rigidity &stability, while minimizing excessive stress on the ant. natural teeth; in this way provide posterior &to minimize occlusal pressure in the ant. maxilla.
- Surgical intervention (vestibuloplasty &excision of flabby tissue).
- Occlusal plane adjustment; this might be done by simple controlled grinding to correct minimal interferences. Moderate to severe interferences may indicate crown construction with regard to all the principles of crown &bridge restorations.

Individual tooth modifications: sharp unworn cusps ⇒ reduce cuspal inclination

Heavily abraded teeth ⇒ reduce Bu-Li width (in some cases due to extension of posterior teeth; anterior teeth are used in function this may lead to teeth attrition).

Occlusal adjustment of the natural teeth is preferable to accomplished in the diagnosis step ,but in certain cases this may be done or further adjustment can be done at the try-in visit. Natural teeth adjustment must be as much as needed only take your time to decide the areas &extent of tooth needed to be removed; plan this adjustment by using a casts & articulator even splints can be constructed to guide this adjustment.

This problem may need orthodontic repositioning of the opposing teeth-indications &age with orthodontic considerations or by altering the clinical crowns of the teeth by means of selective grinding or with restoration. Of course, the clinician may be forced to accept good centric occlusion contacts &premature contacts in the eccentric positions. The excessive premature contacts often cannot be eliminated therefore proper occlusal relation considering some modification.

Several technique could be used to determine occlusal modifications that are necessary 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. This technique 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.

- **Improvement of the denture foundation areas** as augmentations or grafting; dental implant is a strong choice.
- **Diagnostic casts** in most cases is essential to chart the treatment planning &modifications required; in some cases even teeth corrections may be made on the casts to ensure efficacy of these modifications &its approximation to the functional movements &needs of each patient.

Primary impression:-

In an ordinary cases; primary impression can be made as usual, use a stock tray &suitable impression material. If a movable tissue in the upper or lower ridge crest is detected; it is better to use modify the impression technique or material to minimize tissue displacement during impression. Special tray constructed using autoploymerized acrylic; areas require relief & final impression technique must be considered.

Final impression:-

In cases where the flabby or mobile tissues is diagnosed; selective pressure or minimum pressure or even non pressure impression technique must be used in the final impression.

☒ First model:

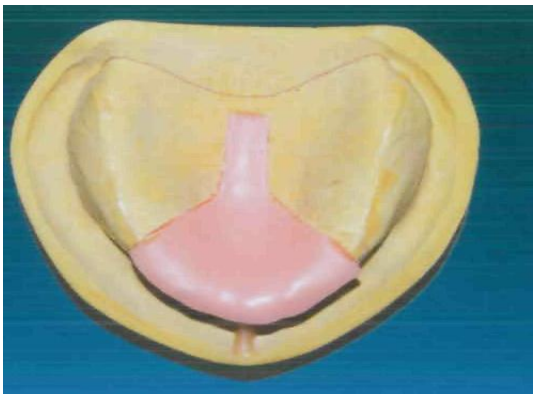
1. The places with flabby mucosa were delineated &as well the places on the "medaina palatine raphe" &" torus palatinus".
2. Those spots were then covered with a wax layer.
3. After that an individual tray is formed.
4. Holes are drilled at the places corresponding to the critical spots mentioned earlier 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.

Jaw relation records:-

Maxillary occlusion rim is constructed with tripod or stable centric stops if possible to record centric jaw relation with wax or other suitable material. If opposing mandible is partial edentulous this indicates construction of lower occlusion rim to have a stable jaw relations.

1. 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.
2. 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.
3. Using gothic arch tracer for CR, or using zinc oxide paste or wax for recording CR.
4. Freeing the anterior occlusion rim.
5. Incisal guidance is set according to the need. Aesthetic of the denture will influence the angle of incisal guidance because of the vertical position of the anterior teeth with various vertical overlap used.

Selection of teeth:

Selection of teeth is important to establish functional &esthetic requirements. Teeth material &location must be evaluated &verified inside the patient's mouth to decide its suitability.

Type of the teeth:

Acrylic teeth it don't cause wear in the opposing natural teeth. It was the teeth of choice, it tend to reduce stress concentration on the maxillary anterior ridge but the major disadvantage that it will abraded more easily than porcelain teeth, which result in loss of vertical dimension, improper stress distribution; with the time when residual ridge resorption of the arches is continued physiologically, the denture retention &stability may affected greatly, these changes in the teeth form after denture insertion neccessate periodic recalls.

Porcelain teeth Never use it opposing to natural because it lead to natural teeth attrition; therefore it is better to let denture teeth to wear rather than the natural one. Porcelain teeth has a good wear resistance; although it is good property but this may lead to:

- Excessive load on the ridge.
- Patient with a single CD need frequent occlusal adjustment to accommodate changes in the basal area &porcelain teeth are difficult to be adjusted.

Acrylic teeth with metal occlusal surface like gold can serve stable occlusion. It can use in patient with financial resources, it minimize wear of the occlusal surfaces and it considered the best material to opposed natural teeth, but they are expensive and need time in their fabrication.

Acrylic teeth with amalgam stop it can use in patient with limited financial resources, amalgam stops can be inserted into the cusp tips of the acrylic resin denture teeth to reduce the occlusal wear, and this technique is simple, less time consuming and less expensive than with the gold occlusion.

To select teeth material you have to consider:

- Opposing teeth, natural or artificial.
- Selected occlusion concept that control function load.
- Remaining teeth alignment; some cases may require reduced teeth number.
- Need for future adjustment.
- Type of denture base material; acrylic or metal.
- Patient history with previous denture-if present- &any problems.

Teeth setting:

Setting of artificial teeth must be done properly with vertical overlap &inclination but in some cases you should not follow the occlusal plane of the opposing teeth because it is mostly not ideal due to extraction, proclination &extrusion. Occlusal forces must be directed vertically toward the supporting tissues to enhance occlusal stability; this may be achieved even if in some cases you cannot place maxillary molars in a maximum intercuspations when opposed natural teeth with steep inclinations. You may reduce these steep inclines to optimum results.

Occlusion:-

-Prevention of the combination syndrome must be our primary objective. Restoring a stable posterior occlusion, while minimizing occlusal pressures on the anterior maxilla. In most of the case even if no contact anteriorly was provided; overtime contact occurs.

-A bilateral balanced occlusion of the posterior teeth using pantographic recordings transferred to a fully adjustable articulator to stabilize the maxillary denture.

-Another way of potentially increasing the stability &retention of the single denture is to use anatomic form posterior denture teeth & a balanced occlusal scheme. By providing balancing contacts when the patient moves through the eccentric movements, the denture is not subjected to tipping forces that can lead to its dislodgement. If the opposing dentition has been worn flat &is not being restored, a

monoplane denture setup may accomplish same result, so, selecting of occlusal concept depend on the occlusal anatomy of the opposing teeth:

Opposing teeth anatomic then balanced occlusion is used.

Opposing teeth are attrited the monoplane occlusion is used.

Try-in step:-

- The teeth in a wax trial denture must be evaluated in CR on the articulator; evaluation of the occlusion in eccentric relations also.
- Modification of teeth position are made to provide balance stable cross arch balance within functional movement (2mm).
- The denture arrangement &all necessary natural teeth modification can be accomplished on the opposing stone cast to mark the location& extent of modification.
- Other methods of teeth adjustment can be used depending on the case &dentist's experience.(teeth adjustment must be determined at diagnosis step)

Denture fracture:-

Fracturing the denture base of the single denture is a common complication because the denture is often opposed by a full or nearly full complement of natural teeth or fixed restorations. The restating high occlusal forces on the denture combined with a typical denture base thickness sometimes results in fracture. Careful control over the occlusion or use of a cast metal base are considerations to prevent this problem. The precipitating factors of this condition could be :-

1. Excessive anterior occlusal load.
2. Deep labial notch.
3. High excessive load due to excessive action of masseter muscle.

Treatment:

1. Check for occlusal contacts.
2. Adequate &even denture base thickness.

3. Do not deepen or improperly shape the labial notch.
4. Cast metal denture base may solve the problem in cases with high fracture potential.

MANDIBULAR SINGLE DENTURE:

The prognosis of a mandibular single denture against natural teeth is less favorable than when the full upper denture is opposing by natural lower teeth. It would be difficult to classify this case as clinically successful. ***Maxillary single dentures are often more successful than mandibular- dentures for a number of reasons:***

1. the mandibular arch is the moveable member of the stomatognathic system (mouth, jaws, and related structures), which inherently decreases its stability.
2. the proximity of the mandibular denture borders to the tongue and other moveable mucosa may lead to easier displacement.
3. the mandibular edentulous ridge, with its limited amount of attached submucosal tissue, provides less support for the denture base.
4. Excessive resorption of the lower ridge due to greater stresses per unit area delivered to the mandibular ridge by the natural teeth.
5. Denture bearting area in mandible less than maxilla.

Therefore, if stability of the single denture is of primary importance for its success, it is clear why patient satisfaction is greater with maxillary single dentures. It has been estimated that lower canines are the teeth retained for the longest. This may suggest that upper teeth are lost before lower arch. The exact reasons are unclear although dental profession's perceptions of the ease &success of upper CD is more than lower CD is may be one major factor.

Problems of single denture:

1. Greater magnitude of forces, lead to change in the underlying bone, the denture will compromised.

2. Occlusal form of the remaining natural teeth, this occlusal form dictates occlusal form of the denture teeth which might be un suitable for denture.
3. Occlusal scheme causing more horizontal forces.

These factors causes occurance of:

- Single denture syndrome..
- Damage of mucosa.
- Ridge resorption.

Alternative treatments &options:

It is clear &well understood the subsequent of single CD construction. Therefore, it is advisable always try to prevent this condition as possible.

1. Planned extraction with immediate denture construction.
2. Over-denture with metal denture base.
3. Using of denture liners with periodic recall for occlusal adjustment &liner replacement.

4. Dental implants: this is regarded as a solution for this condition whenever it is indicated. Dental implant serve as a natural tooth in a limit anchored in the bone that may solve a lot of the single CD associated problems. Stability &retention of the single denture can be increased by means of adjunctive treatment using dental implants &attachments. Dental implants have the added benefit of preserving alveolar bone. This is even more important for the younger patients who, after many decades of support loss, may find themselves unable to tolerate denture.

In new cases of single CD, the dentist must preserve the foundation areas &restore function &esthetic needs of the patient by construction of the prosthesis &always prevent the destructive changes due to denture insertion. Patients with old single CD, the improvement of the denture foundation area &proper denture construction that preserve the remaining tissues &serve function &esthetic.