Complete Removable Dental Prosthesis Supported on Implants

Implant-assisted Overdentures

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How may the edentulous or potentially edentulous jaw be treated?

1) Complete Dentures
   No Implant

   - Conventional Complete Denture

2) Implant-assisted Dentures

   A) Removable Overdentures
   B) Fixed Detachable Dentures
Favourable previous experience of denture wearing
Adequate stability from ridge form
Simple reversible treatment
Lower cost
Surgery precluded
Problems Associated with Conventional Complete Dentures

- Progressive ridge resorption
- Unpredictable fibrous replacement of ridge
- Inherent instability of prosthesis
- Intolerance of mucosal coverage, higher risk of stomatitis
- Variable levels of acquired muscular control
- Changes in facial support due to bone resorption
- Reduced masticatory efficiency
- Emotional distress due to low stability on prosthesis
Rehabilitation of Edentulous Patients

Different Types of Implant-assisted Dentures

Removable Overdenture

Implant-retained FDP
Implant-assisted Overdenture Influencing factors

- Enhanced stability/retention by implant anchorage in a resorbed jaw
- Improved resistance permitting improved tooth positions in the arch
- Reasonable cost for a considerable level of functional improvement
- Facial support by the prosthesis flange (similar to a conventional denture)
- Easy oral hygiene (similar to a conventional denture)
- Higher maintenance requirements
Implant-retained complete FDP Influencing factors

- Total retention and stability of prosthesis
- Optimal function and patient satisfaction
- Reduced mucosal coverage improving tolerance
- Adequate quality/volume of bone is required
- When alveolar ridge is considerably resorbed:
  1) Optimal position of teeth may not be feasible
  2) Esthetics/phonetic will be compromised
- Achieving good oral hygiene is difficult
- High cost
Implant Solutions for Edentulous Patients

Dental implants are able to **support** and **retain** prostheses.

**Fixed Detachable Dentures**

**Removable Overdentures**
## Fixed Complete Denture vs. IS-Overdentures

<table>
<thead>
<tr>
<th></th>
<th>IS- Fixed Denture</th>
<th>IS-Overdenture</th>
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</thead>
<tbody>
<tr>
<td><strong>Load bearing</strong></td>
<td>Implant</td>
<td>Implant-tissue</td>
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<tr>
<td><strong>Retention/stability</strong></td>
<td>Fully secured</td>
<td>Some movement</td>
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<tr>
<td><strong>Occlusion</strong></td>
<td>High biting force</td>
<td>Lower biting force</td>
</tr>
<tr>
<td><strong>Prosthetic space</strong></td>
<td>Less space needed</td>
<td>More space is required</td>
</tr>
<tr>
<td><strong>Tissue coverage</strong></td>
<td>Min. tissue coverage</td>
<td>Partial to full coverage</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Hard to replace atrophied ridge</td>
<td>Ability to replace bone with full flange</td>
</tr>
<tr>
<td><strong>Hygiene</strong></td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>High fabrication cost</td>
<td>Lower Fabrication cost</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>Low maintenance</td>
<td>High maintenance</td>
</tr>
</tbody>
</table>
Function of complete dentures may be greatly improved with as few as 2 implants (mandible)

Patients are more satisfied with implant assisted overdentures since:

- Bite force increase to 60% of natural teeth.
- Significantly more stable.
- More comfortable, patients speak more easily.
Classification

Implant-assisted overdentures

Implant-retained Overdenture

Implant-supported Overdenture

Implant-retained
Tissue-supported

Implant-retained
Implant-supported
Decision-making is defined by:

1) Anatomic conditions & the shape of alveolar ridge
2) Quality and quantity of soft tissues
3) Available amount of restorative space
4) Patients’ expectations
5) Financial considerations
Implant-retained, Tissue-supported

Stability and retention are greatly improved with minimum four implants in maxilla.

Attachment Design Variations

Ball Attachments

Locator Attachments

Bar Attachments
Overdenture is retained on implants with ball and socket anchors and supported by tissue

- Easy to make
- Cost effective; but, not as retentive
- Possible use of existing denture *(Min. adaptation required)*
- Rather fast wear (specially rubber o-ring version)

**Ball Attachments**

1) Ball-shaped Male
2) Sleeve-shaped Female
3) PVC Ring

**Dalbo Classic, Ball & Socket Anchor**
Final Impression

Analogs (replicas)

Analogs in place (in impression)

Master Cast
Implants are joined with STRAIGHT bar with round or oval cross-section and various retentive components

- Better biomechanical design by splinting the implants
- Possible implant angulation correction by the laboratory
- Retentive at first, get loose or break over time
- New denture is usually required
- Hard to adjust and fix

Bar/Clip type overdenture

1) Bar is fixed to implants
2) Clip is attached inside the denture
All attachments are either **rigid** or **resilient**

**Rigid attachments:**
- restricted rotational movement and limited path of insertion,
- better force distribution
- higher rate of friction, wear and breakage if the implants are not parallel

Bar Attachments

Ackermann Clip

Dolder Clips
Ackermann Clips:

- No soldering is required
- Clip is secured by “horizontal tags” surrounded by acrylic
- Adjustable retention
- No additional space is required (no housing)
- High rate of breakage and clip loosening

1) Horizontal retention tag
Hader Clips:

- Easy replacement of plastic clip (interchangeable)
- Available in different levels of retention (color coded)
- Similar to Preci Horix system
- Gold plated machined metal housing
- Combination of the metal housing and plastic clips prevents looseness caused by acrylic breakdown
Locator is a low profile resilient stud attachment with replaceable plastic inserts.

- Lowest vertical height (min. 1.5 mm supra-gingival)
- Different levels of retention and self aligning ability
- Up to a total 40° angle correction (0, 10, 20° angulations)
- Good Retention
- Available in a variety of abutment’s cuff heights
- Needs annual maintenance
Implant-supported Overdentures

Implant-retained, Implant-supported

- Almost no rotational or vertical movements
- Occlusal forces: Fully dissipated by implants not tissues.
Implant-supported Overdentures

Implant-retained, Implant-supported

Attachment Design Variations

Multi-bar Attachments
Multi-ball/locator Anchors
Milled-bar Overdentures
Implant-supported Overdentures

Multi-Bar Attachments

Multi-ball/locator Anchors
Milled Bar is a one-piece milled titanium alloy structure with a passive fit.

- Highest strength compared to other designs
- Milling procedure eliminates porosity issues
- Good oral hygiene due to polished surfaces of the bar
- Great Retention

1) Milled Bat
2) Locator Abutment
3) Co-Cr Sleeve
Milled Bar is a one-piece milled titanium alloy structure with a passive fit.

- Maximum bite force for an overdenture (Up to 80%)
- Complete resistance against rotational and lateral forces
- No weakness caused by soldered or laser-welded joints
- Minimum need for maintenance

1) Milled Bat
2) Locator Abutment
3) Co-Cr Sleeve
Milled Bar Overdentures

Milled-bar / Attachment Combinations

Milled-bars: Basis for different attachment systems

Milled bar / locators

Milled bar / Dolder bar

Milled bar / Preci Vertix

Milled bar / Bredent
Milled Bar Overdentures

Milled-bar / Attachment Combinations

Milled-bars: Basis for different attachment systems

Milled bar / Preci Clix

Mixed: Preci Vertix / Hader clip

Milled bar / Preci Vertix

Milled bar / Hader clips
Maintenance

Attachment adjustment

Dolder Clip, Ackermann Clip

Adjustment tool, Cut away overdenture

Increasing the retention of metal clips
Maintenance

Attachment adjustment

Hader Clip (Resillient plastic)

Tool for changing clip

Different levels of retention

Changing Hader clip

Increasing the retention by changing old clips
Maintenance

Attachment adjustment

Locator Attachments

Increasing retention by changing old Nylon inserts
Thank you