EDENTULOUS MANDIBLE
IMPLANT-SUPPORTED OVERDENTURES

(CARL E. MISCH)

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✓ Introduction
✓ Definition
✓ Implant overdenture advantages
✓ Implant overdenture disadvantages
✓ Implant OD advantages versus fixed prosthesis
✓ Mandibular implant site selection
✓ Anterior bone quantity
✓ Implant OD treatment options
Implant supported overdenture is type of overdenture that is supported by & attached to implants.
Complete dentures have been served as a conventional treatment of edentulous patients worldwide.

The main complaint reported by edentulous patients is instability of the mandibular complete denture.

Complete oral rehabilitation including dental implants is a viable clinical treatment option for total edentulous patients, with good acceptance on functional, comfort and social aspects.
• Improved retention, support and stability.
• Improved occlusion.
• Improved chewing efficiency and force.
• Reduce prosthesis size.
• Psychological.
• Greater abutment crown height space required.
• Long term maintenance.
• Continued posterior bone loss.
• Food impaction.

The mandibular overdenture requires at least 12mm between the soft tissue & the occlusal plane to provide sufficient space for the bar, attachments & teeth.
Implant Overdenture Advantages versus Fixed Prosthesis

- Fewer implants (less bone graft)
- Soft tissue consideration (hygiene, peri-implant probing)
- Reduces stress (parafunctions)
- Lower cost and laboratory cost
- Transitional device until restoration guidelines are complete
Anterior site selection advantages:
• The greatest available height of bone is located in the anterior mandible, between the mental foramina.
• This region usually presents optimal density of bone for implant support.
• Rigid prosthetic support in the anterior region; anterior forces resisted by implant or bars.
• Posterior forces maybe directed on the soft tissue such as the mandibular buccal shelf.
• Overdenture with posterior movement gain better acceptance than removable restorations with anterior movement.
The anterior mandible is divided into five equal columns of bone between the mental foramens:
A, B, C, D, E
# Anterior Bone Quantity (Height & Width)

### Anterior Bone Types

<table>
<thead>
<tr>
<th>Division A</th>
<th>Division B</th>
<th>Division C</th>
<th>Division D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abundant</td>
<td>Sufficient</td>
<td>Moderate atrophy</td>
<td>Severe atrophy</td>
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</table>

![Shape and Quality Diagram](https://via.placeholder.com/150)

- **Upper jaws**:
  - Shape: a, b, c, d, e

- **Lower jaws**

- **Quality**:
  - Group 1 (inner): 1
  - Group 2 (middle): 2
  - Group 3 (outer): 3
  - Group 4 (layered): 4

The cross-sectional shape of the five different groups.

The four different groups of bone quality.
OVERDENTURE OPTION 1 (OD-1)

**Patient Selection Criteria OD-1:**
- Anatomical conditions are good to excellent.
- Ideal anterior & posterior ridge form
- Patient’s needs & desires are minimal, primarily related to lack of retention.

**OD-1** consists of 2 independent implants. These are best placed in the B & D positions to limit the forward rocking of the restoration during function.
Most common type of attachment used in OD-1 is an O-ring design
Disadvantages of OD-1

- Poor implant support & stability because of the independent nature of the implants compared with the option which have connecting bars.

- Increase in prosthetic maintenance appointments.

- For restoration to be inserted & function ideally, the two implants should be parallel to each other and perpendicular to the occlusal plane, at the same horizontal height and equal distance off the midline.
Patient Selection Criteria OD-2:

• Anatomical conditions are good to excellent.

• Ideal posterior ridge form.

• Patient’s needs & desires are minimal, primarily related to lack of retention.

• Patient can afford new prosthesis & connecting bar.
A, OD-2 has implants in the B & D positions & a bar joins the implants. The bar should not be cantilevered off the distal side of the implants. The prosthesis movement will be reduced and too much force on the bar and implants will increase complications.

Attachments such as (B) O-ring or (C) hader clip which allow movements of the prosthesis, can be added to the bar. The attachments are placed at the same height at equal distance off the midline and parallel to each other.
Disadvantages of A & E Splinted Implants

- The distance between A & E implants represents a span of 6 teeth.
- Increase in superstructure movement result in loosening of the coping screw
- Forces are increased on the implant leading to bone loss, mobility & fracture of the implant.
- Implant joined with straight bar are lingual to ridge
- Difficulty with speech.
- Anterior tipping of overdenture
**Patient Selection Criteria OD-3A:**

- Anatomical conditions are good to excellent.
- Patient’s needs & desires require improved retention, support & stability.
- Cost a moderate factor.
- Ideal posterior ridge form

**OD-3A option** corresponds to implants in the A,C,E positions connected with a bar. The attachment should be positioned to allow movement of the distal section of the prosthesis.
Advantages of splinted A,C,E implants

• Less screw loosening

• Less stress to each implant compared with A & E implants

• Less prosthesis movement

• One implant failure still provide adequate abutment support.
OVERDENTURE OPTION 3B (OD-3B)

Patient Selection Criteria OD-3B:

- Anterior bone loss (Division C)
- Poor posterior ridge form

- Implants are best placed in B, C, D position.
- To allow greater freedom of movement of the prosthesis.
- To decrease the risk of overload to the implants, to the screws, bone & to the fabrication of implant overdenture with distal movement of the prosthesis.
OVERDENTURE OPTION 4 (OD-4)

Patient Selection Criteria OD-4:
• Patient desires more retention, major stability and support.
• Patient can afford (cost)

- In OD-4, four implants are placed in the A, B, D, E positions.
- The implants provide sufficient support for distal cantilever up to 10 mm connected with a cantilevered bar.
- The stress breaking attachments are designed to allow some movement of the prosthesis during function.
- Hybrid fixed acrylic denture can be placed
Cantilevered Suprastructure Is A Feature of The Four Or More Implant Treatment Option For 3 Reasons

1. Increase in implant support compared with OD-1 to OD-3

2. Biomechanical position of the splinted implants is improved in an ovoid or tapering arch form.

3. Additional retention provided for the Superstructure bar, limits the risk of screw loosening.
Patient Selection Criteria OD-5:
- Patient has high demands or desires.
- Patient can afford.

- **In OD-5**, five implants are placed in the A,B,C,D,E positions. A bar splints the implants together and it is cantilevered distally.
- Hybrid fixed acrylic denture can be placed.
• Contemporary Implant Dentistry, Carl E. Misch, chapter 14, 293-410
It takes seventeen muscles to smile and forty-three to frown.