Loss of the dentition and the supporting periodontal ligament leads to remodeling of the residual mandibular and maxillary ridges. Resorption of the residual ridge often causes a less than ideal supporting foundation for complete upper and lower dentures. As a result, removal of all the teeth and placement of the complete dentures as a permanent and cost-effective treatment for dental care often results in occlusal forces (e.g., functional, para-functional) that exert adverse forces on the remaining bony structures. The latter has been demonstrated to accelerate morphological changes further reducing support. Retention of natural teeth or tooth roots allows the dentist to slow these processes. The tooth-supported overdenture allows the occlusal forces to be distributed between both healthy root surfaces and oral tissues supporting the denture, thus minimizing the loss of the alveolar bone around the retained roots. Tooth-supported overdentures allow the clinician to successfully manage patients who present with a worn and compromised dentition, and congenitally missing teeth.

1. **Advantages of a tooth-supported overdenture**
   A. The integrity of the adjacent residual alveolar ridge is maintained due to the retention of the abutment teeth.
   B. The stability and the retention of the denture may improve due to the increased bulk of the alveolar ridge.
   C. Patients with tooth supported overdentures have an increased sensory feedback during functional oral processes leading to improved neuromuscular control, when compared to the patients with classical complete dentures.
   D. Improved crown-to-root ratio

2. **Disadvantages of tooth-supported overdenture**
   A. Patient must be self-motivated to maintain excellent oral hygiene.
   B. Development of dental caries and periodontal disease can be more rapid than in a healthy dentition.
   C. There are additional costs involved with a tooth-supported overdenture. These include the cost of abutment tooth modifications, modifications to the denture base and more complex laboratory procedures.
   D. Esthetics of the denture may be compromised due to the abutment tooth position.

3. **Indications for tooth-supported overdenture**
   A. Patients with few remaining teeth that may be healthy or with treatable periodontal disease. Special considerations are given to those patients in whom the overdenture opposes natural or restored natural dentition.
   B. Patients with mutilated or severely compromised dentition. Compromised teeth are selectively extracted, keeping those teeth that have good alveolar support and thus preserving bone level at the selected sites.
4. Selection of abutment teeth
This process takes into consideration: 1) the location of the abutment to be used, 2) its periodontal status, 3) caries history, 4) ability to control caries, and 5) the feasibility to perform endodontic therapy on the selected teeth. The restorative phase of the overdenture therapy must include the design of the restored abutment teeth and the cost of the service.

a. Location of the abutment teeth
The ideal number of abutment teeth is at least one tooth per quadrant. In the mandibular arch, the ideal locations are the canine and bicuspid areas. In the maxillary arch, the ideal locations are the canine and bicusps. Incisors may be used but they are considered less than ideal.

b. The periodontal status of the abutment
The tooth that is periodontally compromised but has minimal mobility (type I) and good treatment prognosis is suitable as an abutment. The potential abutment should have a band of attached gingival tissue surrounding it.

c. The abutment and the feasibility of its endodontic treatment
The teeth selected for the abutments may present with extreme pulpal recession and calcification, and may not need endodontic therapy. However, since the tooth crown must be reduced to achieve maximum crown-to-root ratio and not to interfere with the placement of the denture teeth, an endodontic treatment of the root canal is commonly necessary prior to the overdenture fabrication. If the pulpal canal is not negotiable, the selected tooth is not an ideal abutment.

d. The patient status and recall
An overdenture patient should be scheduled for regular dental recall visits and hygiene appointments. The patient must also be encouraged to use daily application of fluoride gel to prevent caries.

5. Clinical procedures for tooth-supported overdentures

a. The abutment and its final restoration
Vertical space that is available between the occlusal surface of the remaining abutment and the plane of occlusion is the main determinant as to the type of abutment preparation. Preparation coronal to the gingival margin level provides the overdenture with the space for adequate bulk of acrylic material, and therefore, for its strength, while maintaining the gingival support and architecture. The reduced coronal surface will be convex in form. This preparation form has the least influence on the path of insertion of the overdenture. However, this type of preparation offers the least amount of additional stability, and no extra retention. The teeth used as overdenture abutments often do not need an indirect restoration. An amalgam or composite resin fillings are recommended materials for filling the endodontic access. The occlusal surface of the prepared abutment should be slightly convex and highly polished. Abutments that have been reduced with no pulpal exposure due to the canal calcification often do not need a restoration.
Indirect restoration of the abutment (e.g., gold coping) must include a post with an anti-rotational feature. The post length depends on the amount of the remaining tooth structure apical to the gingival attachment, but must be adequate to retain the core portion (>5mm). The prepared abutment tooth receiving an indirect restoration must be at least 11 mm in length. The abutment is prepared to receive a coping that has at least 1.5mm occlusal thickness and either deep chamfer or beveled shoulder margin. The margin must not extend into the gingival sulcus more than 1mm (apical to the free gingival margin).

The final complete denture prosthesis is designed with a relief area of 0.3 to 0.5 mm between the restoration and the denture in order to allow the overdenture to achieve its functional position (soft tissue compliance). An indirect restoration does not eliminate dental caries in an overdenture patient.

b. Fabrication of overdenture
The principles of tooth-supported overdenture fabrication are identical to those described for the fabrication of the conventional complete and immediate dentures. Following the appropriate endodontic treatment of the abutments, the coronal reduction and preparatory restorative therapy of the abutment teeth is performed prior to the final impression taking.

6. Recall and maintenance
Overdenture insertion and follow-up protocols are the same as those described for complete dentures with the exception that the remaining teeth must be carefully monitored for caries and periodontal disease. Long-term home topical fluoride applications are indicated.

Text reference: