

# Precision Attachment Selection – A Systematic Approach

## Part 3 – Root-supported Overdentures

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**E**dentulous patients have always been a challenge for the dental practitioner, one of the prime reasons for the development of osseointegrated implants. However, many patients present for extraction and complete dentures or for implants and implant reconstruction, where a conventional, root-supported overdenture would provide an effective solution. The

preservation and use of remaining roots as the foundation for an overdenture has been in use as a cost-effective treatment modality for over a century. Root-supported overdentures can solve the problems created by the edentulous mandible and maxilla – preserving the alveolar ridge, masticatory function and preventing bone loss while increasing denture retention, stability and resistance to displacement. At the same time, the soft tissue of the residual ridge receives less abuse as the abutment teeth share support. Natural teeth that are unacceptable for conventional dental use are acceptable for tooth-supported dentures (and as the root-crown ratio is improved by reducing the occlusal height of the tooth down to the level of the tissue surrounding it, the prognosis for these teeth becomes far more favourable). Patients also enjoy the proprioception, the awareness of jaw-space relationships that is impaired, if not lost entirely, when teeth are extracted along with improved biting force and neuromuscular control.

### **When are root-supported overdentures indicated?**

- Patient has four or less retainable teeth in an arch.
- Patient presents with badly worn teeth, maligned ridges, and congenital or acquired intraoral defects.
- Stability and/or retention of conventional dentures are a problem.
- Unfavourable tongue position, muscle attachments and residual ridges.
- A dentulous arch opposing a potentially edentulous arch.

### **Are there any contraindications?**

- Patients who cannot be motivated to desired level of oral hygiene.
- Patient has numerous systemic problems.
- Inadequate interarch distance.

**What is the bone support around the abutments?** Abutment teeth should have good bone support (most require at least 6 mm), minimal mobility and be surrounded by healthy periodontal tissues with minimal pocket depth (pockets can be surgically corrected). Slight tooth mobility is not a contraindication as a favourable change results in root-crown ratio from the abutment tooth reduction.

If bone support is good (0-20% bone loss) or if abutments can be made stronger by splinting, non-resilient attachments are indicated. If the bone support is fair (20-40% bone loss), then the choice will most often be resilient attachments. If bone loss is 40% or greater, then the abutments will likely have to be reduced to the height of the gingival tissue and the roots used to retain the overdenture through intraradicular anchors (provides least amount of lateral force to roots).

**Where will abutment teeth be located?** Where possible, abutments should be selected in regions where the occlusal forces have the greatest destructive potential and where the greatest amount of resorption is likely to occur. The greater the number of abutment teeth, the better the support and stability of the resulting overdenture. A rectangular pattern typified by two cuspid and two second molar abutments provides maximum stability and support. However, in many cases, only two abutments are used (one on each side of the arch), either cuspids or bicuspid. As retained teeth are reduced to improve the root-crown ratio, endodontic therapy is usually required (often allows use of malpositioned or tilted teeth as abutments, however, teeth with extreme horizontal or vertical displacement are poor choices).

**What is the anatomical shape and length of the root?** A short and tapered root with narrow cross-section has a poor prognosis, while a broader, longer, more cylindrical root has a good prognosis. More root is like a wedge – more pressure is conducted into the alveolar bone when loaded, which is more likely to resorb, causing the root to loosen.

**Vertical height available?** Consideration of interarch space is mandatory as it influences the amount of tooth reduction, attachment selection and strength of the denture base over areas of retained teeth. When space is limited, a flat button type of attachment should be considered avoiding a “tight bite” situation where the prosthesis is prone to breakage in the future.



*Zest anchor dental attachment consists of a surgical stainless steel female, nylon male and centring sleeve.*

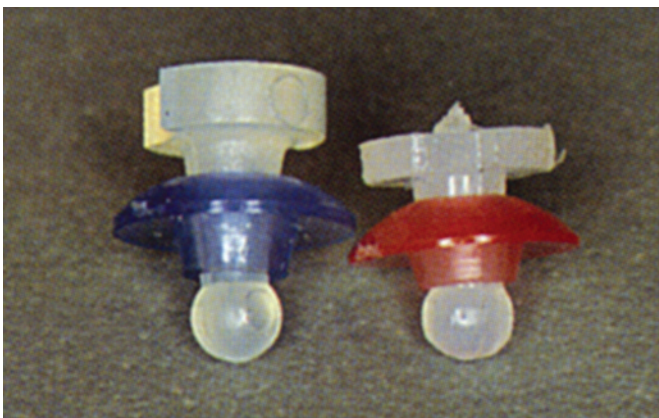
## Edentulous patients have always been a challenge for the dental practitioner.

**How much reduction will be required?** The clinical crowns of selected teeth must be adequately reduced in an occluso-gingival direction to provide a more favourable root-crown ratio (recommendations vary from gingival height to 1-2 mm above the gingival). This compensates for progressive bone loss, reduces torque on the retained roots and can increase the survival time of the root in the jaw. Shorter overdenture attachments have an obvious advantage in this regard.

**Will it be a Radicular or Intraradicular?** – Stud type attachments may be positioned over the root (radicular) or in the root (intraradicular). Both connected to root preparation with male or female soldered or cast to root cap. Generally promote better oral hygiene and offer enhanced crown-root ratios due to their low profile. Stud attachments can be used effectively when there is adequate length of canal and no mobility. Intraradicular designs most often chosen when bone support very limited as feature point of connection inside the root.

**Resilient or non-resilient?** Root-supported overdenture attachments are typically resilient, transferring stress away from the roots and towards the tissue (not solid, rigid, non-resilient types which transfer stress towards the roots). The prosthesis can move up and down or vertically as the patient chews, allowing it to come into maximum contact with the oral mucosa. It distributes the load over the mucosa and directs it away from the abutment. Resilient attachments also provide natural stimuli to the mastication muscles through the retained roots, providing a more natural feel of chewing.

By employing this suggested common sense, systematic question-based approach, you can easily identify the appropriate attachment based on how it works and where it can (or can't) be used. The skilled, experienced Precision Attachment Teams at your closest Aurum Ceramic/Classic laboratory are always ready to assist you in selecting the most suitable attachment for each individual case situation.

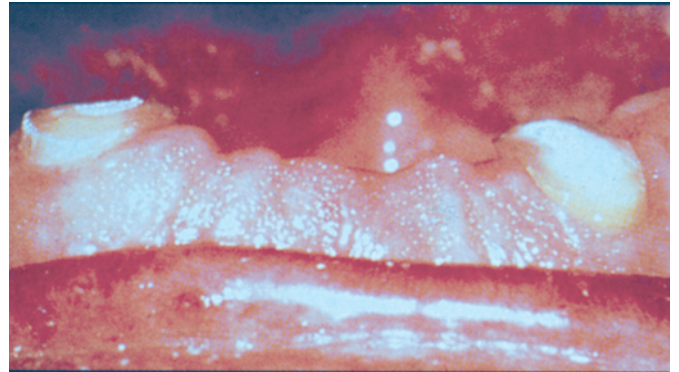


Larger diameter neck on the Zest ST male (right side) permits it to resist bending if a particular patient has shown a tendency to break males.

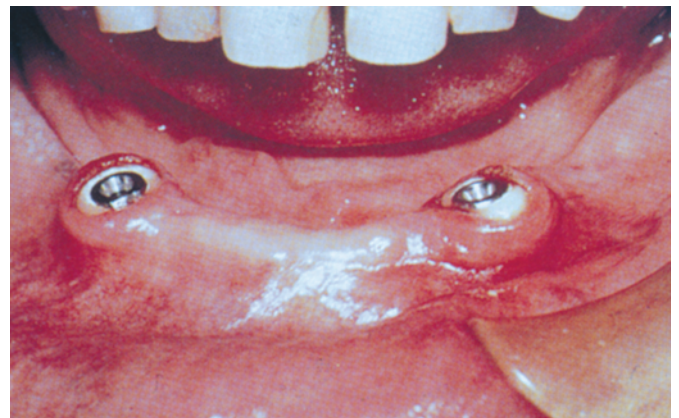
### Case Profile



A patient with two mandibular teeth remaining.



Clinical crowns are reduced and roots saved to preserve the mandibular bone.



Overdenture snaps in place with Zest Anchor attachments providing the patient with secure retention and stability.