The Brown

PerioDontaLetter

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From Our Office to Yours...

Unlike their use in conventional crown and bridge, provisional restorations during implant therapy have been underutilized, often with untoward complications.

Provisional restorations help evaluate esthetic, phonetic and occlusal function prior to delivery of the final implant restorations while preserving and/or enhancing the condition of the peri-implant and gingival tissues.

Provisional restorations are also useful as a communication tool for the treatment team.

This current issue of ***The PerioDontaLetter*** *describes and discusses the various options for provisionalization in implant dentistry.*

Provisional Restoration Options in Implant Dentistry

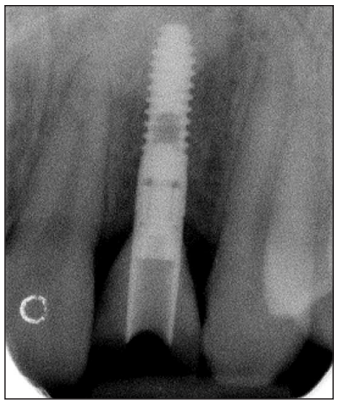
The use of provisional restorations in implant therapy is an important clinical step which should not be neglected and which should be carefully planned by the restorative dentist prior to the implant surgery.

The provisional restoration

- Provides a functional and stable occlusion.
- Restores and enhances esthetics and phonetics.
- Protects the underlying gingival tissues and implant site from excessive occlusal pressure during the healing phase.
- Determines the future position, support, shape and shade of the final prosthesis.

The provisional restoration should not interfere with primary wound healing.

A well-designed provisional restoration is predicated on three factors:



Figures 1 & 2. A screw-retained provisional restoration was utilized to develop gingival contours while satisfying the need for tooth replacement.

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1. The ultimate restorative plan.
2. The number and location of the implants.
3. The needs and desires of the patient.

One of the restorative challenges clinicians face is making the final implant prosthesis imitate the natural tooth when emerging from the gingival tissues.

This is because the shape of the implant is more circular and smaller in diameter than the root of a natural tooth and the margins of the restoration must be narrow enough to fit the implant head.

The transition zone between the implant shoulder and the gingival crest, often to the contact areas, is shaped by the subgingival part of the provisional restorations.

This transition zone can be up to 5mm deep, especially in the palatal and interproximal tissues of teeth in the esthetic zone.

The peri-implant tissues must be permitted to adapt to the dimensions of the provisional restoration.

Following the shaping and maturation of the peri-implant tissue, the clinician needs to transfer this information to the working cast.

This may be accomplished with a custom impression coping or by retrofitting the provisional restoration to the working cast.

The customized impression coping allows the clinician to capture the molded soft tissue with the appropriate emergence profile onto the master cast.

Screw-retained provisional restorations are especially advantageous in shaping the peri-implant tissues in the anterior esthetic region.

Temporary cylinders are placed directly on the implant level and adjusted to fit into the occlusion. This permits the clinician to sculpture the soft tissue in an anatomically optimal shape creating a good foundation for an esthetic final result.

A provisional crown is then built up in the laboratory on the master cast or chairside by using self or light cure resin or composite resin according to the diagnostic waxup.

The design of the provisional restoration should be as close to the final restoration as possible to support optimal soft tissue sculpturing and avoid unnecessary interference with the biological process.

In esthetic cases, the shade and surface characterization of the provisional restorations can be altered using composite modifiers.

Shades and surface characteristics of the provisional restoration can be used by the treatment team and the patient to evaluate the desired shade and surface characteristics of the final restoration.

Provisionalization Prior to Implant Loading

Soft Tissue-Supported Removable Prostheses

- **Modifying existing prostheses** facilitates implant placement because they provide a transitional solution that was already esthetically and functionally satisfactory to the patient.
- **Removable partial acrylic dentures** replace missing teeth and the flanges can provide necessary lip support.

They are simple to construct, relatively inexpensive, easy to adjust and repair, and can have teeth added for patients in staged treatment with serial extractions.

Ideally, these should be tooth supported with clasps to prevent excessive pressure on the healing implant site.

Provisional dentures also need to be designed to minimize contact with healing soft tissue and exposed

Figures 3, 4 and 5. Following removal of the upper right central incisor, the patient's own natural crown was used in an Essix appliance as a temporary restoration.



Figures 6, 7 and 8. A screw-retained provisional restoration was constructed utilizing a temporary implant abutment to replace the upper right lateral incisor.

implant abutments which may cause uncontrolled implant loading resulting in implant exposure, marginal bone loss and/or failed integration.

Tooth-Supported Provisional Restorations

Some patients may not like or are unable to tolerate a removable provisional prosthesis. In these cases, fixed provisional prostheses are sometimes necessary.

- **Maintaining strategic teeth with a long-term hopeless prognosis** is often a good strategy to support a fixed provisional bridge until the final restoration can be all implant supported.
- **Resin-bonded restorations** are tooth-supported restorations which protect the implant site from occlusal loading while providing functional occlusion and esthetics.

A resin-bonded, cast metal framework such as the Maryland Bridge is suitable for long-term provisionalization in the anterior region, especially in young patients.

This type of provisional is difficult to repeatedly remove and replace as the bond strength between the metal retainer and the enamel can be unpredictable.

Furthermore, the laboratory costs are relatively high.

- **Orthodontic appliances** (brackets or archwire) may be used on several teeth adjacent to the implant site with an attached pontic.

Prosthetic or natural tooth replacements may be attached directly to an existing archwire, or to brackets which are bonded to adjacent teeth with an inactive archwire.

- **The Essix appliance** avoids many of the disadvantages of a partial denture.

This prosthesis consists of an acrylic tooth or the patient's extracted tooth bonded to a clear vacuform tray made from an accurate cast of the arch prior to extractions and placed over the adjacent teeth like a night guard or retainer.

This option protects the underlying soft tissue and implant during the healing phase.

It is limited in that it does not mould the surrounding soft tissue.

- **Snap-on Smile®** is another interim appliance which fits over the patient's upper or lower arch. This appliance is made of a high-tech dental resin which makes it very thin yet extremely strong.

Transitional Mini Implants

In extended partially edentulous areas where there are few natural abutments to support a provisional restoration, one or more transitional implants may be used.

These narrow diameter implants are similar to root form implants, provide immediate tooth replacement, and allow the patient to immediately experience the positive benefits of implant dentistry.

Transitional implants can be used to support fixed restorations or to retain full dentures.

These small implants (1.8mm-2.5mm in diameter) appear to be more successful in the mandible than the maxilla due to the increased density of the bone.

They have proven effective in protecting implant surgical sites, as well as providing the other prere-

"Construction of provisional restorations may take more time, but in the long run, they save time and expense at subsequent appointments and produce better restorations."

Figure 9. In replacing congenitally missing lateral incisors, denture teeth were attached to the archwire as provisional teeth while the ridge augmentation and implants healed.

quisites of an acceptable transitional restoration.

Care should be taken in planning the position of these implants and with their maintenance post loading.

They should not interfere with potential implant sites or be placed in poor quality bone.

Once the traditional size implants integrate, the transitional provisional restoration is converted into an implant-supported restoration and the transitional implants are removed.

Provisionalization Post Implant Placement

Implant-Retained Provisional Restorations

The most important advantage of provisional restorations in the early phases of a proposed implant procedure is the ability to shape and "train" the peri-implant tissues.

This process will establish natural and esthetic gingival tissue including the papillae which will help the laboratory fabricate an anatomically appropriate and esthetic soft tissue model.

Provisional restorations may be placed at the time of implant surgery or after an appropriate healing period.

These restorations may be cement retained or screw retained.

Cement-Retained & Screw-Retained Provisional Prostheses

In non-esthetic regions of the mouth, clinicians often use a prefabricated abutment with a plastic protection cap.

These abutments come in various heights to allow enough space for the metal and porcelain in crown construction.

In esthetic regions, provisional restorations can be fabricated from prefabricated acrylic or composite crowns, hollowed out denture teeth or similarly modifying a natural clinical crown.

The disadvantage of cemented provisional crowns is the frequency of cement being expressed subgingivally.

Screw-retained crowns are not only advantageous when modifying contours of the soft tissues is desirable; these crowns can be removed multiple times without the risk of excess cement having a negative impact on the surrounding tissues.

Conclusion

The value of the provisional restoration cannot be understated. It has applications during the planning stage right through the final prosthesis. It provides a valuable communication tool for clinicians, laboratory technicians and patients.

Construction of provisional restorations may take more time, but in the long run, they save time and expense at subsequent appointments and produce better restorations.