Simplified Protocol for Relining Provisional Prosthesis on Natural Abutments: A Technical Note

This article describes a simplified technique for relining provisional prostheses on natural abutments that can be applied to this specific type of tooth preparation with feather-edge finish line. Starting from a diagnostic wax-up, a provisional fixed restoration is constructed, containing all the correct structural information. This includes the controlled depth of the prosthetic margin into the gingival sulcus, the emergence profile, and the area from the emergence profile to the gingival third. Chair time is saved during the clinical procedures because the finishing and polishing steps are shortened, and the resulting provisional restoration is precise and highly biocompatible. This technique allows for a simple and quick relining and finishing procedure and for the delivery of an esthetic and biocompatible provisional restoration. Int J Periodontics Restorative Dent 2018;38:e25–e28. doi: 10.11607/prd.3338

The clinician needs to address and solve a series of biologic, biomechanical, and esthetic diagnostic issues before proceeding to the final prosthetic rehabilitation of one or more teeth. The design of the provisional restoration is first established by a diagnostic wax-up. The clinician can use it to assess a number of basic esthetic decisions, such as shape, color, position, and morphology of the incisal edges, length/width ratio of teeth, and placement of the prosthetic margin. From a biologic and esthetic point of view, the positioning of the prosthetic margin appears to be a fundamental issue. The biologic width of the gingival tissue includes the sulcular epithelium, the epithelial attachment, and the connective attachment. This anatomical structure was defined as supracrestal gingival tissue since it extends from the gingival margin to the alveolar ridge.

This tissue has a high variability in thickness and width relative to the relationship of the width of the alveolar process to the size of the teeth and it is referred to as the biotype. The biologic width evaluation of periodontally healthy teeth is defined as the average apicocoronal extension of the supracrestal gingival tissue that can range between 2 and 6 mm. These results are consistent with a clinical survey of 400 teeth: the conventionally recognized
3 mm of supercrestal gingival tissue is only present in 46.8% of patients. Even if according to some studies the sulcus area should be avoided, the intrasulcular positioning of prosthetic crown margins presents esthetic advantages. Furthermore, there are two clinical situations in which supragingival positioning of the prosthetic margins is not feasible: the need to add mechanical retention and the need to reprepare an abutment with subgingival margins without violating the biologic width.

For these reasons, it is necessary to position the prosthetic margins subgingivally for satisfactory esthetic results after periodontal health has been established.

One feature of the vertical preparation is that it allows selection of the prosthetic finish line within the gingival sulcus if the prosthodontist carefully prepares the intrasulcular position of the clinical crown, respecting the epithelial and connective tissue attachment.

The goal of the present article is to describe a protocol that shortens chair time and simplifies the provisional restoration finishing and polishing procedures. Topics such as emergence profile, resistance and retention, finish line types, finish line location, occlusal aspects, and materials are beyond the scope of this study.

**Technical Note**

**Laboratory Phase**

The design of the provisional restoration is established by a diagnostic wax-up. Teeth are prepared on the dental stone model using diamond burs (859 104 018, Komet) (Fig 1).

After the occlusal reduction, the axial walls are prepared extending into the intrasulcular area. The intrasulcular extension varies from case to case, depending on the probing depth (Fig 2). Using the abutment long axis as a reference, the dental technician inclines the bur facially with an angle that ranges from 30 to 50 degrees to prepare the sulcus area. If the patient presents a thin biotype, the bur inclination toward the facial is around 30 degrees; in cases of thick biotype the bur facial inclination can be up to 50 degrees. This step creates the space needed for the emergence profile that would otherwise interfere with the stone replica of the gingival margin (Fig 3).

After preparation of the stone abutments, a transparent vacuum shell is prepared to highlight the differences between the stone model and the intraoral preparation. The transparent disk used for this vacuum shell is 1 mm in thickness (Byte Plane Morbido, Effegi Brega).

Using the diagnostic wax-up, the dental technician fabricates an acrylic resin provisional restoration extended inside the sulcus (Vertys Templus Dentin, Vertys Templus Enamel, and Vertys Artist, Vertys system). This provisional restoration contains all the information (controlled depth of the prosthetic margin into the gingival sulcus,
emergence profile, area from the emergence profile to the gingival third, gingival scalloping, interdental spaces). The dental technician fabricates an occlusal index to correctly position the provisional restoration during the relining procedure.

**Clinical Phase**

The clinician prepares the abutments following the stone model. Using a transparent vacuum shell and a colored fit-checker paste (Xantopren L Blue, Heraeus Kulzer), it is easy to highlight differences between the stone and natural abutments and to correct them (Fig 4). Before relining the provisional restoration, waxed dental floss is placed in the interdental spaces to give a limit to the relining acrylic resin. Autopolymerizing acrylic resin is used to fill the small gap between the tooth and the fitting surface of the provisional restoration.

The provisional restoration is placed intraorally together with the occlusal index for better positional precision (Vertys Surgical, Vertysystem) (Fig 5).

Before full polymerization, excess facial, interproximal, lingual, and palatal resin is removed with a thin probe. This allows preservation of the provisional prostheses surface characterizations, emergence profile, and polished surfaces as fabricated by the dental technician. The finishing procedure will be minimal at this point.

After full polymerization, the provisional restoration is removed from the mouth and the internal finish line is highlighted with a pencil. Any remaining space is filled with acrylic or composite resin (Fig 6). The provisional restoration is finished and polished. The emergence profile, the gingival scalloping, and the interdental spaces usually need little finishing. Especially on the facial surface, the clinician only needs to finish the small portion of the provisional restoration corresponding to the intrasulcular margin, without removing, carving, or modeling the excess resin that usually expands to the middle third of the crowns (Figs 7 and 8). Final glaze is accomplished by the application of a light-cured nanofilled varnish that seals all the...
Porosities of the polished surfaces (Optiglaze, GC). The provisional restoration is cemented (RelyX Temp NE, 3M ESPE) and the occlusion checked (Occlusionspapier 40 µm, Bausch; Shimstock 8µm, Coltene) (Fig 9). The final zirconia-ceramic prosthesis is placed, and the patient is followed up for 3 years (Fig 10).

Conclusions

The described relining technique for periodontally healthy natural abutments has different clinical advantages. It saves chair time during the clinical procedures, since the finishing and polishing steps are shortened due to the small amount of excess relining material to be trimmed away; it promotes tissue integration of the provisional restoration due to the controlled depth of the prosthetic margin into the gingival sulcus and the correct emergence profile; and it presents tissue biocompatibility, since the final glaze is accomplished in the laboratory and the relining technique does not interfere with the polished surface of the provisional prosthesis.

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References