

## Temporary fixed prosthesis - single units

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### Summary

The author presents in detail the provisional restoration techniques related with fix prosthetic treatment - single units. The advantages and disadvantages of provisional restorations are detailed. The direct, indirect and direct-indirect techniques are described step by step. The benefits of each method described are also submitted.

Keywords: provisional restoration, preformed crown, Scutan technique, emergency prosthesis.

### Introduction

Teeth must be protected from the environment injuries, when they are prepared to receive a prosthetic restoration, no matter its design. The need for provisional restorations is motivated by many reasons:

- Cutting hard dental tissues often results in an exposed dentin wound to bacteria, chemical and thermal injuries;
- Periodontal irritation and overlap of the gingival margin beyond the cervical limit of the tooth preparation may occur;
- The prepared tooth might change its position, as related to the opposite and adjustment teeth;
- After reducing the labial and lingual surfaces there is no longer periodontal protection during mastication;
- Food impacts might damage the papilla, due to the loss of the proximal contacts;
- Phonetics and esthetics are strongly affected when preparing anterior teeth.

There have been a lot of chemical methods used in dental practice to protect tooth preparations, but the best choice is a provi-

sional restoration. We, like many others, believe that temporary prosthesis should be used as a routine method until the final restoration is ready. Then, the patient will face no discomfort as regards mastication, phonetics or esthetics.

The use of provisional restoration offers us certain benefits: [1]

- Patient's confidence in his doctor increases;
- The masticatory function is partially restored, because the provisional restorations are usually fixed with temporary cements;
- Complete esthetics and phonetics is achieved (except the case when we use metal provisional crowns in molars);
- The temporary crown restores proximal contacts and axial contours of the natural tooth and so offers periodontal protection;
- By restoring the tooth loss, the provisional restoration avoids vertical and horizontal movements of the prepared, opposite and adjustment teeth;
- Pulp protection is carried out on prepared-vital teeth;
- The provisional restoration maintains

and/or provides information about the color, form, size and position of the final prosthesis; it also enables defining the incisors curve, occlusal plan, mandibular functional movements, dental guidance;

- The temporary single units prosthesis allows putting off the insertion of the final restoration till needed: unfinished endodontic treatment, incomplete healing after dental surgery, sensitivity after root canal filling;
- The dentist can verify the tooth preparation in all respects: the amount of hard tissues reduction, space availability for the final restoration, retention and resistant form, the parallelism of multiple preparations;
- The provisional restoration is sometimes used as an emergency prosthesis, which provides the patient comfort until the final restoration is ready; [2,3]
- Temporary prosthesis provides time enough for the doctor and the dental technician to perform the final treatment, without pressure from the patient.

The provisional restoration is sometimes more satisfying esthetically than the final one and therefore it might have a negative impact on the treatment. The patient might delay or postpone dental appointments and sometimes he never comes back to continue the treatment.

Because of poor stability, the temporary prosthesis might cause a lot of trouble: moving during mastication, crack or being swallowed. Some people might evidence allergic reaction and pulp irritation due to the acrylic component of the prosthesis (in some direct techniques);

Nevertheless, provisional restoration increases the amount of work, additional materials are needed and the cost of the treatment is higher.

## Single unit provisional restoration - direct techniques

**Resin or polycarbonate preformed crowns** may be used for provisional restorations.

Polycarbonate exhibits the most natural appearance of all the preformed materials used. When it is properly selected and modified, it rivals in appearance with a well-executed porcelain restoration. [4]

Working steps:

- First we choose the crown that fits the preparation (form, size, color). It is important to get the crown with the same cervical diameter as that of the tooth.
- The selected crown is adapted until we obtain complete fit to the tooth preparation (cervical, labial and relatively proximal, incisal, and lingual fit).
- Some holes are made with a round bur to allow resin excess to go out and some additional proximal holes in case the crown does not restore proximal contacts.
- Tooth isolation with Vaseline;
- Choose the color of the acrylic resin and fill the crown with the prepared paste.
- Insert the crown on the preparation, remove the excess and move the crown up and down to obtain mobility after the material is cured.
- After the additional resin is completely cured, remove the crown and make all the adjustments (incisal, cervical, occlusal, proximal);
- Check the occlusion in centric and eccentric mandibular movements;
- Finish and polish the crown;
- Fix the crown temporarily.

## Celluloid or polypropylene sheet for provisional restorations

Transparent sheets are available in various sizes and forms. A 125 x 125 mm sheet of 0.5mm thickness is recommended for mak-

ing provisional restorations [4].

The technique is similar to the one previously described, with certain modifications:

- It is necessary to make the proximal holes in order to obtain a provisional crown in contact with the adjustment teeth.
- After the insertion of the celluloid sheet filled up with resin paste, insert a wood/plastic stick mesially and distally.
- After the resin curing process is complete, cut the sheet and remove the new provisional crown.
- Make the necessary adaptation, finish and polish the crown, than fix it temporarily.

**Temporary preformed metal crowns** are usually used in molars and premolars.

The material of these provisional crowns comprises aluminum, tin-silver, and nichel-chromium [4]. There are certain particular aspects as to the technique:

- Select the crown to fit the cervical size of the tooth.
- Cut the crown to enable occlusal contacts.
- Care must be taken to avoid fracture of the cavo-surface margin of the tooth preparation when fitting a metal crown form. The highly ductile alloy allows the crown cervix to be crimping inward, to fit the tooth closely.
- Create convexities on lingual and labial faces of the crown using by special instrument (tongs).
- Occlusal adaptation is obtained by pressure applied by the opposite tooth in centric occlusion.
- Check the occlusion and, if necessary modify the occlusal contacts using a round tip instrument, pushing from the inside of the crown or pressing from outside. Verify the eccentric mandibular movements as well.
- Smooth the cervical margin. Do not

polish!

- Fix the crown with temporary cement.

### **Scutan-technique ("copy method")**

Scutan was the first material used for this technique. After 14 years, Scutan was replaced by other materials, Protemp. Protemp II, Protemp Garant (ESPE), which enabled performing very good provisional restorations [5].

Working steps:

- Restore the tooth natural crown with a provisional restorative material;
- Take a silicon impression of the restored tooth and the adjustment teeth;
- Prepare the tooth for the final prosthetic treatment (including pre-prosthetic therapy);
- Isolate the prepared tooth and the adjustment teeth (if they are restored with acrylic or composite materials) with Vaseline.
- Prepare the self-cured resin paste and fill in the impression only at the place of the prepared tooth;
- Insert the impression in proper position;
- After the resin is cured, remove the impression, than the acrylic crown.
- Follow the steps previously described for acrylic preformed crowns.

The *advantages* of this method consist of:

- ⌘ The provisional crown is a real copy of the natural tooth crown;
- ⌘ The impression may be used, if necessary, for another provisional crown.

Single unit provisional restoration - direct-indirect techniques

### **Indirect Scutan technique [3]**

Working steps:

- Take the impression of the tooth before preparation (if necessary, restore

the tooth crown with a provisional restorative material);

- Prepare the tooth for the final prosthetic restoration;
- Take another impression, of the prepared tooth. Use alginate, than pour in quick-setting gypsum; [4]
- Prepare the acrylic paste, fill in the first silicone impression and apply on the stone cast (the auxiliary cast) previously obtained;
- After the curing process is complete remove the impression and the provisional crown from the cast. Then follow the same already known steps for adaptation, finish and fix the crown.

This technique evidences certain

*advantages:*

- ⌘ Resin polymerization develops outside the mouth, eliminating possible allergic reaction or tissue irritation that might occur in some patients. There is no contact of free monomer with the prepared tooth or gingiva, which might cause tissue damage (ulceration, stomatitis, pulp inflammation); [4,5]
- ⌘ The marginal fit of the provisional restoration is significantly better than that of the provisional restorations obtained by Scutan-technique.
- ⌘ It provides the patient a chance to rest;
- ⌘ The provisional crown is quickly obtained without laboratory assistance.

**Single unit provisional restoration - indirect techniques**

The dentist prepares the tooth, takes an impression and delivers it to the laboratory to have the provisional restoration made. This technique frees the dentist to perform extra tasks, but it takes longer until the provisional crown is fixed in place. Anyway, this method provides good manufactured crowns with proper adaptation to the tooth preparation.

**Provisional restorations using the old crown**

The old crown may be used as a provisional crown. After the dentist cuts down the old restoration he can turn it into a provisional one. If necessary, acrylic resin is added inside to properly fit the crown to the preparation.

**Temporary post-crowns**

Usually, this kind of provisional restorations are made on seriously damaged teeth. After the endodontic treatment is performed, the tooth is prepared for a post and core to restore the coronal part of the tooth. Then a full crown is made in order to restore the tooth totally.

The provisional restoration in such cases is obtained, following the subsequent steps:

- Adaptation of a preformed acrylic or polycarbonate crown;
- Adaptation of a preformed post to the root canal preparation;
- The two pieces - crown and post - must fit together;
- Prepare the acrylic paste and fill in the root canal, insert the post then the preformed crown (already filled with the same paste) in the mouth.
- After the polymerization process is done, remove the provisional restoration, make necessary adjustments, check the occlusion and fix it temporarily.

If the tooth involved is healthy but will be prepared for a post-crown, then the Scutan- technique is recommended.

If there is an old post-crown it can be turned into a provisional restoration, by using the old crown together with a new post.

## Conclusions

Although provisional restorations are usually intended for short-term use, they are able to restore esthetics, phonetics and mastication satisfactorily. They also provide good

protection for teeth and periodontal tissues until the final restorations are ready.

The success of fixed prosthesis often depends on the care with which the provisional restorations are designed and manufactured.

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