

## Provisionals In Dentistry – From Past To Recent Advances

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**ABSTRACT:-** Provisional restorations are created to improve esthetics, function and strengthen tooth for a limited period of time till it is being replaced with a definitive prosthesis. They are considered as a fundamental part of fixed prosthodontics treatment. Properly fabricated provisional restoration is necessary to achieve a successful restoration. An understanding about most efficient provisional materials is beneficial and saves a lot of time. Recent provisional materials are functional, esthetic and easily repairable. This article concentrates on various recent advances in provisional materials.

**Keywords:** Provisional restorations, polymethyl methacrylate resins, bis-acryl composite, protemp crown

### I. INTRODUCTION

In fixed prosthodontics a properly contoured provisional restorations helps in maintaining the gingival health, protects the pulpal tissue, and serves as a blueprint for the laboratory during fabricating the final restorations. Thus in order to protect these prepared abutment teeth, provisional restorations are fabricated and the process is called as Temporization<sup>1</sup>. The term “provisional” denotes “serving for the time being”, as a necessary step in providing for the final arrangement<sup>2</sup>.

Ideal provisional restorative material should meet the following requirements:

1. Protect Pulpal tissue and sedate prepared abutments
2. Provide an environment conducive to periodontal health
3. Provide method for immediately replacing missing teeth prevent migration of abutments and opposing teeth
4. Protects the pulp from thermal and chemical insults after crown preparation and enamel removal<sup>3</sup>.
5. It serves to maintain gingival health and contour while providing for an esthetic and/or functional interim restoration<sup>4</sup>.
6. Protect teeth from dental caries
7. Ensure marginal seal

A variety of materials has been in use for interim restorations, with research aimed at combining strength and esthetics in the search for the ideal provisional restorative material. Several types of acrylic resin materials are available for interim restorative treatment like polymethyl methacrylate resins, polyethyl methacrylate resins or combinations of unfilled methacrylate resins.<sup>5</sup> They are subcategorized based on method of polymerization like chemically activated, light activated or dual activated. Provisional crowns can be either prefabricated or custom made.

### II. ACRYLICS

From 1937 poly methyl methacrylate was available in granules and molding powders. The popularity of this material increased so fast. By 1946, 95% of the denture bases were fabricated with it. Auto polymerizing acrylic resins provide adequate short term interim prostheses (i.e., three months) because of their increased strength. However, their fabrication is more time consuming, has an objectionable odor. In general, their popularity is due to their low cost, esthetics, and versatility. Polymethyl methacrylates are commercially available as Jet (Lang), Alike (GC America), Temporary Bridge Resin (Dentsply/Caulk), Neopar (SDS/Kerr), and Duralay (Reliance). Advantages of this material include low cost, good wear resistance, good esthetics, high polishability, good color stability whereas it also has certain drawbacks like significant amount of heat given off by exothermic reaction, high degree of shrinkage (about 8%) objectionable odor, short working time, hard to repair and radiolucent<sup>6</sup>.

### Bis-Acryl Composites

Bis-acryl provisional materials are resin composites and represent an improvement over the acrylics because they shrink less, give off less heat during setting, and can be polished at chair side. Conveniently, the majority of these products are provided in cartridges for use in an auto mix dispenser gun. The bis-acryl composites can be subcategorized according to method of activation (e.g., chemically activated, visible light activated, or dual activated). Bis-acryl materials are compatible with other composite materials, but alterations for repairs and addition are difficult<sup>7</sup>. Young et. al.<sup>8</sup> compared bis-acryl and polymethyl methacrylate materials in terms of occlusion, contour, marginal fidelity, and finish. For both anterior and posterior teeth, they found the bis-acryl materials significantly superior to PMMA in all categories and amongst the various materials, studies have concluded that Protemp IV is most color stable and with superior mechanical properties.

### Techniques of fabrication:

1. Custom fabricated provisional restoration technique
  - Indirect technique
  - Direct technique
  - Indirect/ Direct or Hybrid technique
2. Pre-fabricated provisional restorations
  - Polycarbonate crowns
  - Cellulose Acetate Crown Forms
  - Stainless Steel Crowns
  - Nickel-Chromium Crown

Provisional restorations can be fabricated directly on the prepared teeth with the help of a matrix (direct technique) or indirectly by making an impression of the prepared teeth (indirect technique). A combination indirect direct technique can also be followed which has evolved as a sequential application of these that involves fabrication of a preformed shell that is relined intra-orally. The indirect technique also avoids subjecting prepared tooth to the heat evolved from the polymerizing resin<sup>9,10</sup>.

## III. RECENT ADVANCES

### 1. PROTEMP CROWNS

Protemp crown is a pre-fabricated composite provisional crown made of light curable methacrylate composite which was introduced as malleable and adjustable. To fabricate a protemp crown simply select the appropriate size and adapt the crown to its oral environment. Then light cure, polish and cement using standard temporary cements<sup>11</sup>. Prottemp crowns are available for molars, bicusps and canines. Available as a kit containing 9 sizes (Figure 1a). Prottemp crowns are not available for incisors.



Fig. 1a, Various sizes of prottemp crowns

### Procedure

Appropriate Prottemp crown is selected and trimmed according to the gingival contour. Then prottemp crown is placed gently on the preparation. Use finger to ensure the crown is in line with adjacent teeth. Ask patient to close mouth slowly and gently into occlusion. Adapt buccal margin using composite instrument (Figure 2a). Tack cure buccal surface for 3 sec (Figure 2b). Similarly adapt it to the lingual surface and occlusal surface and tack cure for 3 seconds. After tack cure remove prottemp crown carefully and put crown back in several times, to ensure fit before final cure. Then fully cure for 60 seconds outside mouth, making all surfaces light cured. Finally the margins are trimmed (Figure 2c) and prottemp crown is cemented (Figure 2d).



Fig. 2a. Adapting protemp crown to the buccal margins



Fig. 2b. Light cure buccal surface for 3 seconds



Fig. 2c. Margins are trimmed



Fig. 2d. Prottemp crown is cemented

## 2. Temp Tabs Thermoplastic Matrix Wafers

Temp Tabs® Natural and True Blue flexible multiuse thermoplastic matrix tabs (Figure 3a) are flexible matrix for fabricating temporary crowns and bridges and for quick bite registration material<sup>12</sup>. They are suitable for any and all provisional materials. They can be easily adapted to desired shape. There is no liberation of heat.



Fig. 3.Temp Tabs® Natural and True Blue flexible multiuse thermoplastic matrix tabs

Its applications are:

- a. Matrix for Temporaries(Figure 3b)
- b. 5 Minute Chairside Night Guards
- c. Quick Bite Registration (Figure 3c)
- d. Implant Placement Guide
- e. Implant Abutment Jig
- f. Implant Space Maintainer



Fig. 3b Matrix for fabrication of provisionals



Fig. 3cQuick Bite Registration

#### IV. TUFF-TEMP PLUS

Tuff-Temp Plus is an impact resistant rubberized-resin. It does not show polymerization shrinkage and holds tightly to the tooth. It displays very high flexural strength without brittleness. Margins are perfect<sup>13</sup>. Virtually eliminates fractures and debonding. Grinds and powders during trimming without softening or distorting. The light cure option creates a restoration with full strength on demand. It is grinded and powdered during trimming without softening or distorting. It is well suited for use with a clear vinyl polysiloxane template.



Fig. 4a. Matrix is filled with Tuff-Temp Plus and seat in the mouth.



Fig. 4b. Completed provisional restoration

### 3. CAD-CAM PMMA Provisionals

Provisional restorations are digitally fabricated from polymethyl methacrylate (PMMA) and yields a highly precise and anatomically detailed result<sup>14</sup>. PMMA temporaries (Figure 5) are milled out of a dense block and shows reduced the porosity of traditional hand processed techniques, reducing chair time and cracking. Axial contours and occlusal anatomy provided from tooth libraries produce additional anatomy that mimics natural teeth<sup>14</sup>.

**BioTemps** provisional crowns & bridges are created with CAD/CAM technology.



Fig. 5. BioTemps provisionals

Indicated for provisional splinted crowns and provisional full-arch bridges. BioTemps Implant Provisionals look like realistic temporaries at any stage of implant treatment. Cast-metal substructure is indicated when pontic span is greater than 3 units. BioTemps with metal reinforcement last up to six months.

## V. CONCLUSION

Provisional restorations are usually planned for short-term use and then discarded. They should provide pleasing esthetics, adequate support, and good protection for teeth. They should be selected carefully for clinical applications preserving periodontal health. Proper planning is needed to ensure the most suitable provisional is



used, especially when multiple teeth are to be prepared. Therefore dentists should be familiar with the techniques and range of materials available.

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