Impressions for FPD
Sectional models, dies

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2015
information
**Impression**

- soft, semifluid material placed in the mouth and allowing that material to set

1. It should be an **exact duplication of the prepared tooth**, including all of the preparation, and enough uncut tooth surface beyond the preparation to allow the dentist and technician to be certain of the location and configuration of the finish line.

2. Other **teeth and tissue adjacent** to the prepared tooth must be **accurately reproduct** to permit accurate articulation of the cast and to allow proper contouring of the restoration.

3. The impression of the preparation must be **bubble free**, especially in the area of the finish line.
Die-cast impression for FPD

- Impression for die = impression of the prepared surfaces and finishing line
- Impression for cast = approximal contours and correct occlusion
- It is essential that impression materials adhere firmly to the impression trays.
- perforations or by the use of adhesives.
GINGIVAL RETRACTION
Single cord technique

- A piece of fine retraction cord is placed in the gingival sulcus
- A thicker cord is placed over the first leaving a tag for removal
- The thicker cord is removed after washing (note clearly defined sulcus) and impression
- The buccal tissues are relatively thin and great care is needed to avoid recession.
- Sufficient haemostasis can usually be achieved with ferric sulphate solution to allow the impression to be recorded

Two cord technique:

- A piece of fine retraction cord is placed in the gingival sulcus
- A thicker cord is placed over the first leaving a tag for removal
- The thicker cord is removed after washing (note clearly defined sulcus) and impression
- The buccal tissues are relatively thin and great care is needed to avoid recession.
- Sufficient haemostasis can usually be achieved with ferric sulphate solution to allow the impression to be recorded
To insure adequate reproduction of the preparation, the gingival finish line must be temporarily exposed by enlarging the gingival sulcus.

- **Retraction cord**
  displaces gingival tissue mechanically; they also can have a chemical action when impregnated with astringents and vasoconstrictors that cause tissue contraction and hemostasis.

- **Chemical action**
  astringents impregnated in retraction cords include aluminum chloride, ferric sulfate, alum (potassium aluminum sulfate) and zinc chloride.
  least irritating cords contain buffered aluminum chloride, which may be left in the sulcus for up to 15 minutes without permanent damage.

- **Electrosurgery**
  creates a trough around the tooth by removing superficial cell layers from the gingival sulcus’ inner lining through application of an electric current.

- **Rotary gingival curettage**
  removes the sulcular epithelium with a high-speed diamond bur.

Cords has the smallest effect on the gingiva and rotary curettage has the largest effect.
Gingival Retraction
Pastes & Gels

- Paste used for gingival retraction opens the sulcus, physically displacing the tissue and leaving the field dry,
- Place it directly into the sulcus, leave it for one to two minutes, then rinse. When you use it before taking the final impression,
- Little or no pressure required to apply, that minimizes the risk of rupturing the epithelial attachment.
- Bleeding and crevicular seepage are controlled through the presence of aluminum chloride.
For FPD:
elastic impression materials

These materials can be stretched and bent to a fairly large degree without suffering any deformation. Used for recording the patient's mouth where undercuts are present.

1. Hydrocolloid:
   Alginate

2. Synthetic elastomers:
   Polysulphide
   Polyether
   Silicone

Rigid
Non undercut areas
- Impression Plaster
- Compound
- Zinc-oxide eugenol paste
- Wax
Opposing arch impression - Alginate

- Hydrocolloid impression materials:
  - Poor dimension stability and
  - Low tear resistance
The synthetic elastomers

First introduced in the late 1950s,

- These are used where a high degree of accuracy is needed, especially in crown and bridge work.
- They have two main advantages over the Hydrocolloids - good tear resistance and dimensional stability.
- They are mainly hydrophobic rubber based materials.
- All of these materials come in different viscosity's:
  - kneadable-putty
  - high viscosity - heavy bodied
  - regular viscosity - intermediate flow
  - low viscosity - light bodied
  - very low viscosity - light bodied
Silicone elastomers

- Condensation cured silicones: dimension stability problem
- In contrast, addition cured silicone rubbers are considered the most dimensionally stable impression materials. Like polyethers, they set, not unexpectedly, by an addition cured polymerisation reaction. No by-product is produced during cross-linkage resulting in an extremely stable impression which has been shown to remain unchanged over a substantial period of time.
IMPRESSION TECHNIQUES

SINGLE MIX

Regular viscosity - intermediate flow monophase pastes/monophase technique

Custom tray

DOUBLE MIX

Low viscosity-correction material or wash
High viscosity-heavy-bodied or putty or tray material or preimpression material

One stage
Two stage

Crowns and other extra-coronal restorations: Impression materials and technique
IMPRESSION TECHNIQUES

- SINGLE MIX
  Regular viscosity - intermediate flow
  monophase pastes
  Custom tray

- DOUBLE MIX
  Low viscosity-correction material or wash
  High viscosity-heavy-bodied or putty or tray material or preimpression material

  One stage
  Two stage
Double mix
TWO STAGE IMPRESSION technique

An impression is taken with the heavy-bodied material. This is then removed from the mouth and inspected. The light bodied material is then prepared and squirted over heavy-bodied material and then impression relocated.

Heavy-bodied putty serve as a custom tray for a thin „wash” of a less highly filled, low-viscosity silicone.
Escape channels

- Procedure:
- Cut back impression material to the borders of the tray
- Remove undercuts
- Remove material between unprepared teeth
- Cut in grooves up to the occlusal level at unprepared teeth alternating orally and buccally/facially 2mm wide und max. 1mm deep
Double mix

ONE STAGE IMPRESSION technique

Light bodied impression material is placed in a syringe, and placed over the areas where high detail is required (e.g. over a crown preparation). Some is then squirted over the heavy-bodied impression material which has been loaded into an impression tray. The impression is then taken as normal. This technique saves time, but it can be very labour intensive because the two need to mixed at the same time.
Visible flaws related to impression technique which occur commonly include:

- Finish line not visible
- Air bubbles in critical places
- Voids or drags
- Unset impression material on surface of impression and cast

Invisible impression flaws, resulting in an apparently good fit of the restoration on the die but a poor fit on the tooth, may also occur because of:

- Tray and impression recoil
- Detachment of impression from tray
- Permanent deformation
“Laboratory inspection is an important part of quality control, but many technicians find it difficult to feed back to their dentists for fear of the messenger being shot.”

Communication!
As none of us can achieve perfection every time there is much to be said for encouraging technicians to feed back
SECTIONAL MODEL

- **CAST**: the positive likeness of a patient’s upper or lower jaw
- **DIE**: small model of prepared teeth
The dies of the prepared teeth or roots can be removed separately from the cast to make a very accurate or precise wax pattern for making a fixed dental appliance.

- Materials for preparing dies:
  1. **die stone**: most widely used
  2. Acrylic
  3. Polyurethane

Essential function of the die is to allow a restoration to be constructed in the laboratory which has an accurate internal or fitting surface.
Methods of making die casts

- the base of the die provides a means of locating the die within a larger localizing model which includes the other teeth on the arch adjacent to the prepared tooth.
- the die can be removed and replaced in its original position

Several methods are used for making sectional casts:

Pindex method
Kiefer method
Crystal method
Pindex-method

Images from: Dr. Peter Hermann, Zoltan Hajdu: Sectional casts
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Gingival mask

Images from Dr. Peter Hermann and Zoltan Hajdu
Thank You for Your attention