PREPARATION TECHNIQUES IN DENTISTRY: CONSERVATIVE DENTISTRY AND ENDODONTICS

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THERAPY OF CARIES

- PREVENTION (secunder)
  - incipient caries
  - reverzible caries (without cavitation)

- RESTORATION
  - caries superficialis
  - caries media
  - caries profunda
  - irreverzible caries with cavitation
PREPARING THE TOOTH FOR FILLING are called **TOOTH (CAVITY) PREPARATION**

The shape of the lesion is changing.

**Instruments**

1871 Morrison
Forrás:Forrii Judit

**Rules,**

**knowledge for preparation**
Possibilities for preparation

- Hand instruments
- Rotary cutting instruments
- Oscillating instruments
- Laser
- Chemical-mechanical caries removing
- Air abrasion
Not only the removing of carious tooth structure, but form, function, esthetic, retention, resistance.
This aim requires:

- Biological knowledge of the tooth and parodotium
- Knowledge of the enamel and dentin structure
- Information about the filling material
- Occlusion

Factors, affecting cavity preparation:

- Extension of the caries
- Oral hygiene
- Filling material
Classification of cavity
G.V. BLACK (1914)

Base: „the predilection places of caries” on the anatomical crown.

I.-V. Classes

Later will be added
- Class VI. (not predilection place)
- root surface caries (not on the anatomical crown)
Predilection places are retentionplaces. These places have no self-cleansing!

Retentionplaces are:
- fissure and pits
- smooth surfaces between the aquator of the tooth and the gingiva
Anatomic and clinical crown.

Clinical crown < anatomic crown

Clinical crown > Anatomic crown
Class I.

- All pit and fissure cavities

Where are pits and fissures?
Cavities on the proximal surface of posterior (premolar and molar) teeth. Smooth surface caries M(O); (O)D; M(O)D; (toward or from the midline)
Cavities on the proximal surface of anterior teeth, that **don’t involve** the incisal angle

Cavities on the proximal surfaces of anterior teeth that **involve** the incisal angle
Cavities on the gingival third of the anatomical crown. These can be on the facial or lingual surfaces of all teeth.

Not pit and fissure cavities!
Class VI.

- Cavities on the incisal edge of anterior teeth, or on the occlusal cusp heights of posterior teeth.

Not predilection place!
Caries begins on the root surface (not with enamel covered surface)!
Surface: untouched part

Wall: prepared surface

Line angle: the junction of two walls

Point angle: the junction of three walls

Cavosurface angle or cavosurface margin: the junction of prepared wall and the untouched tooth surface

**Homework!** (The name of the walls, line angles, and point angles I-V. cavities)
During the years the rules were modified many times.

"EXTENSION FOR PREVENTION"

Aim: was to prevent the secunder caries

The border of the cavity should be extended to areas that are normally self-cleansing, or cleansable, therefore healthy tooth structure can be removed.
1. Healthy tooth structure should be preserved
2. All friable enamel should be removed
3. All faults should be include in cavity
4. Good finishable position into the enamel
5. The outline of the filling should be shortened
BASIC PREPARATION DESIGN

Depends on the filling material and the extension of caries

- CONVENTIONAL: for amalgam, inlay, rootsurface caries; Macroretention

- Feature:
  - Box-like cavity, special enamel margin, secondary retention are used very oft.
BASIC PREPARATION DESIGN
Depends on the filling material and the extension of caries

- **BEVELED CONVENTIONAL:** earlier amalgam was the filling material, and now komposit will be the filling material. Makro- and mikroretention

- **MODIFIED, or ADHESIVE or MINIMAL-INVASIV:** no special walls, line angles and point angles! Only carious tooth structure will be removed, and cavosurface margin will be prepared beveling (komposit) Mikroretention.
RULES OF CAVITY (TOOTH) PREPARATION
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I. INITIAL STAGE
(primery steps)
- opening of the cavity
- outline form, and initial depth
- primary resistance form
- primary retention form
- convinience form

II. FINAL STAGE
(secondary steps)
- removal of infected dentin and old filling
- pulp protection
- secondary resistance and retention form
- finishing the prepared walls
- cleaning, inspecting…
Together are made!

High speed, with cooling, diamond, or hardmetal bur. The shape of the bur depends on the caries!

Decision: preparation is made with the principle of „extension for prevention” or without this principle.

Nowadays: this principle are used only as exeption!
Definition: Preparation resists displacement or removal of the restoration from tipping or lifting forces.

Retention is influenced by the contact between the restorative material and tooth.

- mechanic contact:
  - macromechanic: amalgam
  - micromechanik: komposit
- chemical: rare glassionomer
- electrical: weak

Differences according to the restoration

- inlay (indirect rest.) metal, esthetics
- filling (direct rest.) amalgam, komposit
Primary resistance form

- **Definition:** Both the tooth and restoration can withstand *without fracture* the masticatory forces.
- **Preparation:** Primary retention and resistance form are prepared together.
- **Principle:**
  - box shape, flat floor, slightly rounded line angles,
  - thickness of restorative material
  - walls: parallel, divergent or convergent

- **CONVINIENCE FORM**
Carious dentin: why now, and how?
Difference between carious and healthy dentin in practice
Carious dentin - infected has to be removed - affected
Difference: in color and hardness
- Caries indicator, sharp excavator, steel/hardmetall round bur

Old restoration should be removed, if
- negatively affect the new one
- compromise in retention
- caries is under the filling
- the pulp was symptomatic preoperatively
- the periphery of remaining filling is not intact
The aim of finishing: is to create the best marginal seal between the restorative material and tooth.
- afford a smooth marginal junction
- provide maximum strength of both the tooth and filling near the margin.

Don’t use turbine!
To preserve the tooth, in case of irreversible pulp inflammation, pulp necrose, or periapical pathosis, caused by caries, (or other disease) the therapy is root canal treatment.

The chemo-mechanical cleaning and shaping of the root canal, the all canalsystem has to be closed, without space.
Endodontics

Steps of the root canal treatment: after the rtg, and diagnosis

1. Removing every carious dentin
2. Access cavity preparation
   Aim: total remove the roof of the pulp chamber
   straight line access
   minimal tooth structure removal
3. Localisation of the entrance of root canal
4. Working length determination
5. Kemo-mechanical cleaning and shaping
6. Obturation, and control
Access cavity preparation
Kemo-mechanikal cleaning and shaping of the root canal

Principle
Carry out

Preparation with handinstruments
- Standard preparation
- Flaring preparation
  - step-back
  - step down
  - kombination of step back and down

Preparation with engine driven System
- Different rotary systems
  - Pro taper
  - Pro file
  - Light speed
  - Ultrasonic
  - Sonic