METHODS OF CARIES TREATMENT
CAVITY CLASSIFICATION
NOMENCLATURE
RULES OF CAVITY PREPARATION

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METHODS OF CARIES TREATMENT

PREVENTIVE treatment (secunder)
- incipient caries
reversible, not cavitated Lesion

RESTORATIVE treatment
- caries superficialis
- caries media
- caries profunda
irreversible, cavitated Lesion
Preparing the tooth for filling are called **TOOTH (CAVITY) PREPARATION**
- instrument, **rules**

**THE AIM OF MAKING FILLING**

- Not only the removing of carious tooth structure, but
- retention, resistance
- form
- function
- esthetic
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)
The predilection places of caries” (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
Anatomical crown: covered with enamel.

Clinical crown: can be seen in the oral cavity.

The clinical crown can be: shorter, longer or the same, as the anatomical crown
Anatomical and clinical crown.
Class I.

- All pit and fissure cavities

Where are pits and fissures?
Class II.

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)
Class III. and IV.

Cavities on the proximal surface of anterior teeth, that **don’t involve** the incisal angle

Cavities on the proximal surfaces of anterior teeth that **involves** the incisal angle
Class V.

- 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!
Root surface caries

- Caries begins on the root surface (not with enamel covered surface)!
- Predilection place!
Surface: untouched
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)
BASIC PREPARATION DESIGN

Depends on the filling material and the extension of caries

- **CONVENTIONAL**: for amalgam, inlay, rootsurface caries;
  - Macroteethetion
  - Box-like cavity, special enamel margin, secondary retention are used very often.

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

- **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) Mikroteethetion.
GENERAL RULES
OF CAVITY PREPARATION

G.V. BLACK (1889)

During the years the rules are many times modified.

Reason:

- Prevention
- Filling material

“extension for prevention”
RULES OF CAVITY PREPARATION
(table of contents)

I. INITIAL STAGE
(primer steps)
- outline form, and initial depth
- primary resistance form
- primary retention form
- convinience form

II. FINAL STAGE
(secunder steps)
- removal of infected dentin and old filling
- pulp protection
- secondary resistance and retention form
- finishing the prepared walls
- cleaning, inspecting…
Initial stage/primary preparation outline form, and initial depth

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!
„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.

- **Nowadays**: this principle are **not used** routinly. (It is used only in case of bed oral hygiene)
PRINCIPLES NOWDAYS
for the outline form

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
FACTORS, WHICH INFLUENCE THE OUTLINE FORM

1. The extension of carious lesion
2. Esthetic consideration
3. Occlusal relationship
4. Adjacent tooth contours
5. Cavosurface marginal configuration

IMPORTANT IN CASE OF OUTLINE FORM

Preserve the strength of marginal ridge and the strength of the cusps.

Decision: about keeping, or reduction of the cusps.

1. Keeping: extension of caries is less, than half of the distance (50 %) between the primer fissure and the height of the cusp.
2. Considerable: if the distance is between 50% and 75%
3. Reduction: extension of caries is bigger, than 2/3 (75%) of the distance.
Marginal ridge and cusp

2/3 rule
**Initial depth**
in conventional (amalgam) preparation

- **Pits and fissures:** has to be 0.2 mm into the dentin. This means 1.5 mm depth into the central fissure.

- **Smooth surfaces:** in case of the axial walls 0.2 and 0.8 mm into the dentin. Deeper (0.8 mm) preparation is used, where there is no enamel. (on the root-surface)
Primary retention form

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**
Primary retention and resistance form

box shape, flat floor, slightly rounded line angles,
-thickness of restorative material
-walls: parallel, divergent or convergent

Marginal ridge!
I. INITIAL STAGE
   (primer steps)
   - outline form, and initial depth
   - primary resistance form
   - primary retention form
   - convinience form

II. FINAL STAGE
   (secunder steps)
   - removal of infected dentin and old filling
   - pulp protection
   - secondary resistance and retention form
   - finishing the prepared walls
   - cleaning, inspecting…
II. FINAL STAGE
Removal of any remaining infected dentin and/or old restorative material

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
Removal of any remaining infected dentin
/Pulp protection/
Secondary resistance and retention forms

Two types are:

1. Mechanical features: all require additional removal of tooth structure
   - retention lock, grooves, coves, skirts, pins, slots
   - beveled enamel margins This is oft done into the next step, depending on the filling material!

2. Treatments of the prepared walls: etching, priming, and bonding.
   This is not really considered as a part of the tooth preparation
Secondary resistance and retention elements

„Proximal grooves”.

For improving the retention, we can prepare in dentin parallel with the axio-pulpal wall, between this wall and the facial/lingual walls.

Slot Preparation (MO or OD)

is in Dentin (between the the Pulpa and Enamel-Dentin junction.
Finishing the prepared walls

The aim of finishing: is to create the best marginal seal between the the restorative material and tooth.

- afford a smooth marginal junction
- provide maximum strength of both the tooth and filling near the margin.

Fine grit diamond or finishing metal bur!
Cleaning, Inspecting,

Cleaning: not with alcohol!
(Chlorhexidin gluconat)

Inspecting or control of cavity:
- is there any opacity?
- is the pulp chamber closed?
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