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research & innovation
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Cavity preparation for direct esthetic restorations (modified preparation rules)



Dr. Mikolicz Ákos

Preparation types (repetition)

↳ Conventional prep.:

- Amalgam, metal inlays, root-surface caries

macromechanical retention

↳ Beveled conventional prep.

- When exchanging amalgams to composite fillings

macro + micromechanical retention

↳ Adhesive (minimally invasive)

- Composite fillings

micromechanical retention (adhesive technique)





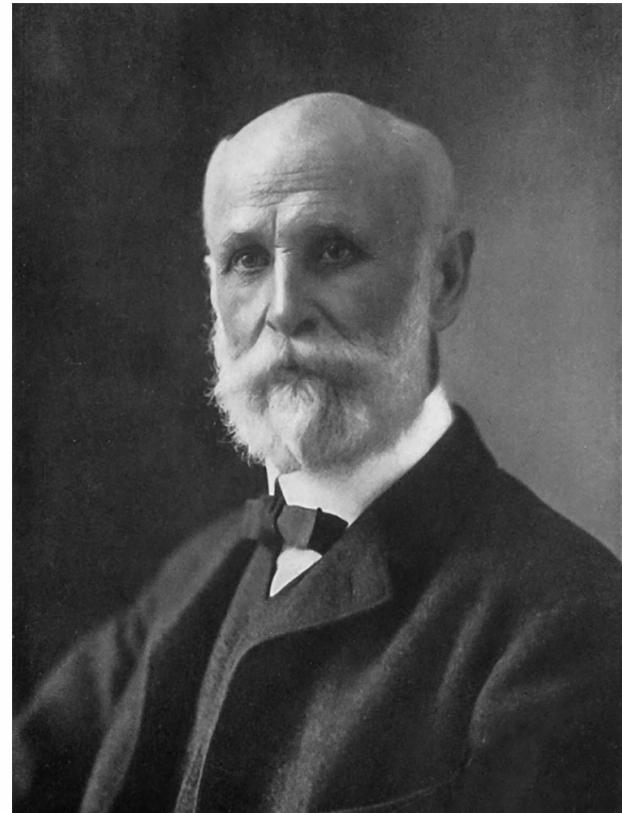
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1. Conventional preparation (repetition)

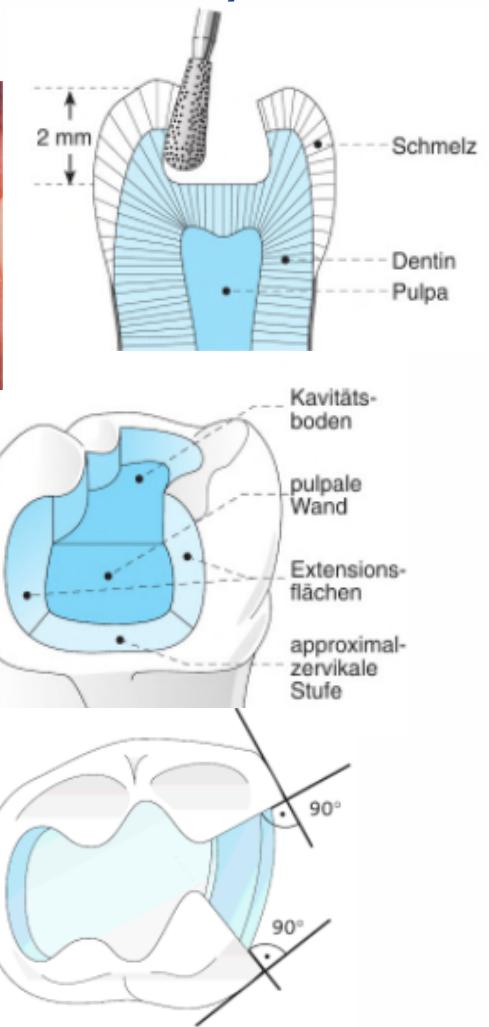
- ↳ Conventional preparation Black's principles
- ↳ • Preparation is extended always in dentin
 - ↳ → extending the depth (pulpally or axially or both) to a prescribed uniform dimension-2mm
- ↳ • Extension for prevention – preparation is extended in the not decayed fissure
- ↳ • extension of the preparation to the facial and lingual line angles in order to bring "self-cleansing" margins
- ↳ • Not supported enamel is removed



1. Conventional preparation (repetition)

- ↳ For example in case of amalgam
 - Parallel walls (amalgam occlusal/vestibular/oral convergence)
 - Plain pulpal and gingival floor (rounded edge and angle)
 - Create 90-degree amalgam margin
 - Box preparation – class II
- ↳ Cavity is bigger than the caries itself

weakened tooth



2. Beveled conventional preparation

Indikation:

- Exchange of amalgam fillings
- (amalgam → composite)
- the shape and size of the cavity is defined by the existing restoration



2. Beveled conventional preparation

➡ Conventional preparation+ beveling of enamel margins

+ optionally secondary retention elements

The restorative material adheres to the tooth **macro+micro-mechanically**. resistance form is furthermore important, but retention form is not needed

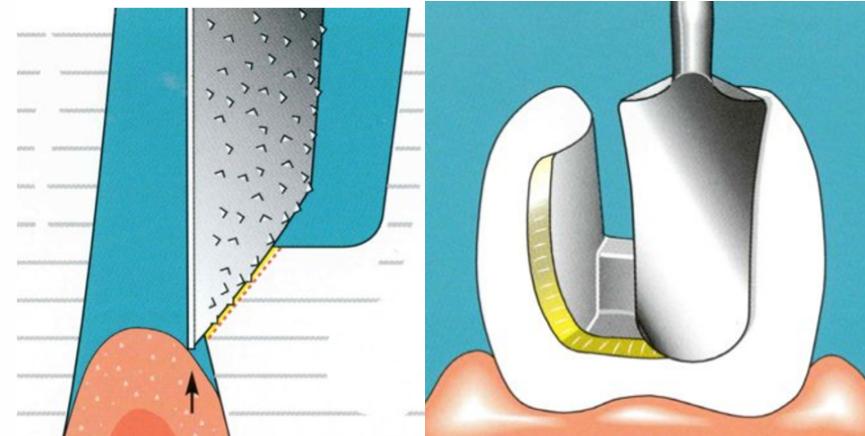




Beveling of enamel margins

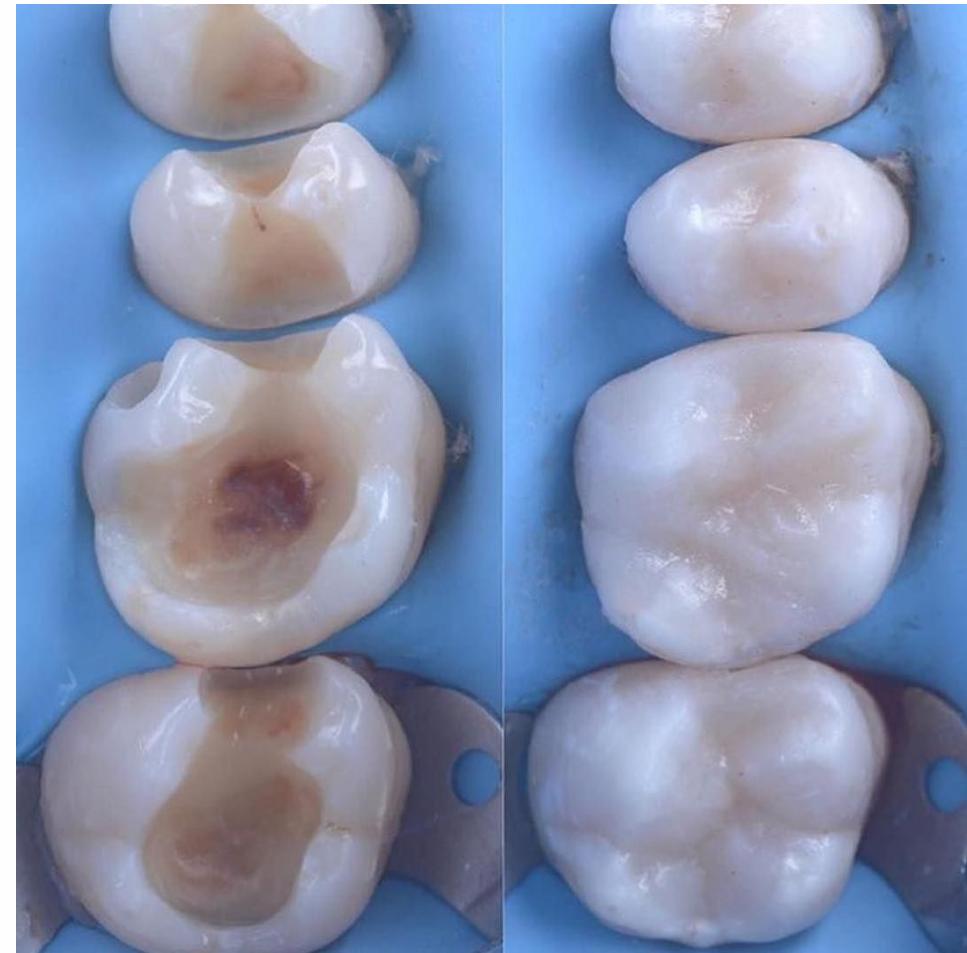


- ↳ Surface enlargement!
- ↳ Only in enamel
- ↳ Width of bevel: 0,5-1mm, 45 °
- ↳ **Occlusally no beveling!**
 - the thin edge breaks on occlusal forces
 - in case of narrow vestibulo-oral approximal box: no bevel preparation
 - in case of wide vestibulo-oral approximal box: bevel preparation
 - gingival bevel
 - ↳ Only if the preparation margin is at least 2 mm above the enamel-cement border, and there are plenty of enamel

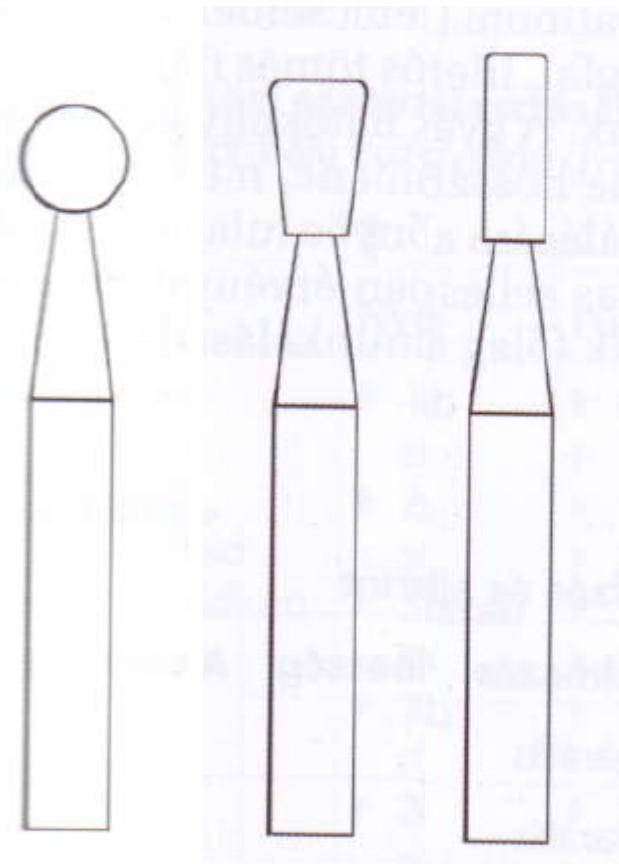
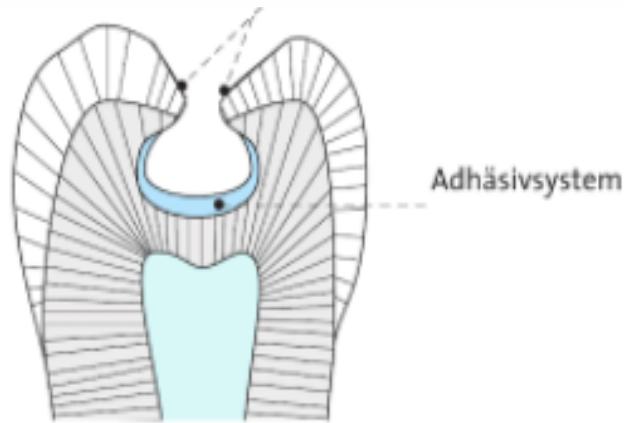


Adhesive preparation (minimally invasive prep.)

- ↳ In the case of composite fillings
- ↳ Minimally invasive
- ↳ Defect-oriented
- ↳ No beveling occlusally:
 - ↳ The thin edge breaks on occlusal forces
- ↳ Approximately:
 - ↳ In case of narrow vestibulo-oral approximal box no bevel preparation
 - ↳ In case of wide vestibulo-oral approximal box bevel preparation
- ↳ No preventive extension
- ↳ Gingival bevel
 - ↳ Only if the preparation margin is min. 2 mm above the enamel-cement border, and there are plenty of enamel



Class I.

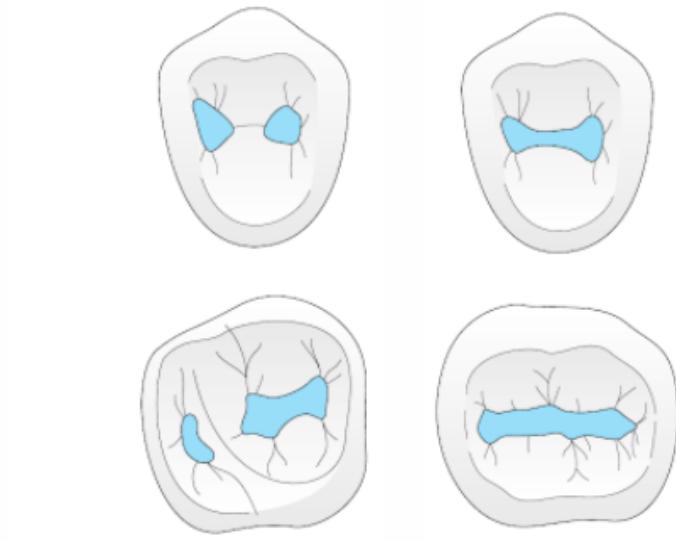


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Class I. cavities

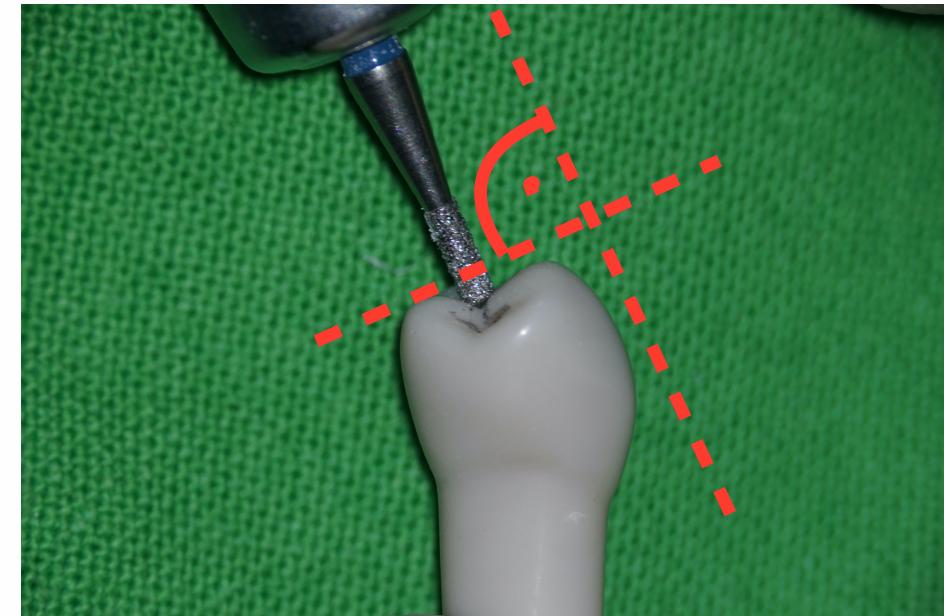
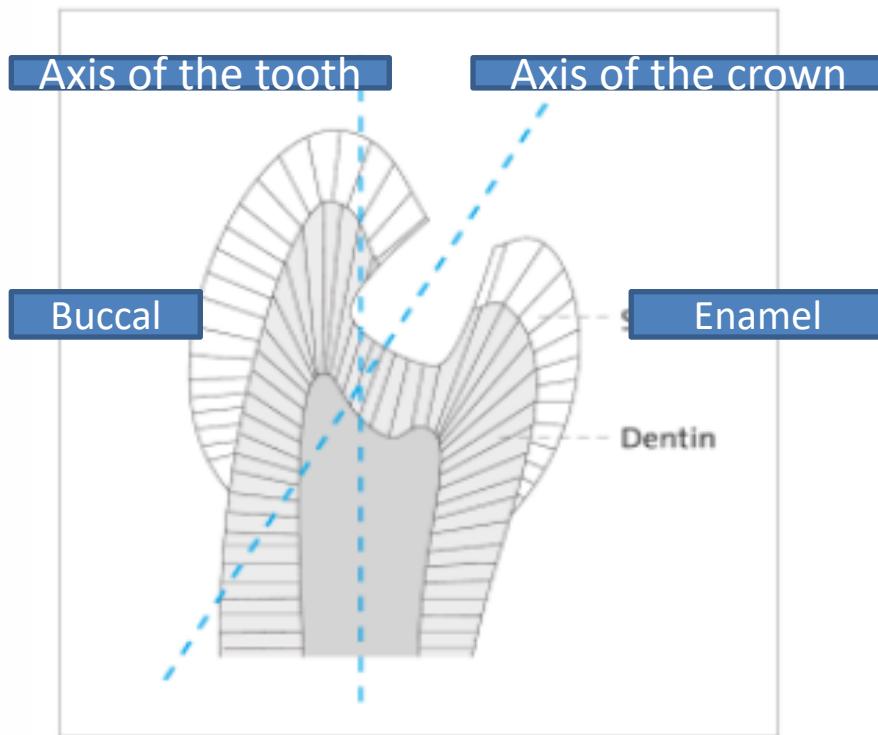


- ☞ The cavity shape is determined by the size of the carious defect. The access cavity must be large enough, so that the decay can be removed under good visibility. Overhanging, not dentinsupported enamel is removed only, when there is a danger of fracture risk.

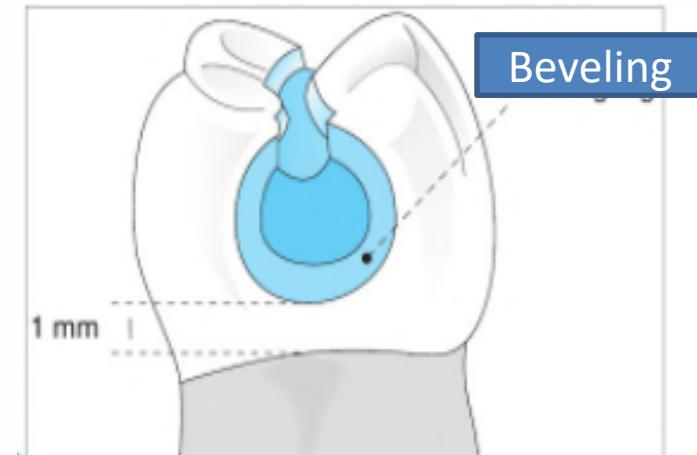
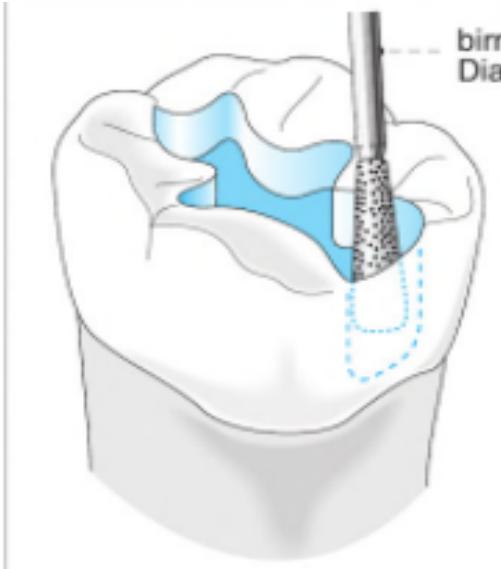


Axis of the tooth!

- At lower premolars preparation is carried out in the direction of the crown axis and not in the axis of the tooth.



Class II.

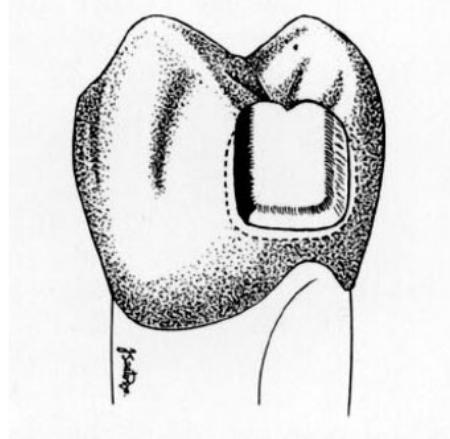


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Approximal design of the margin



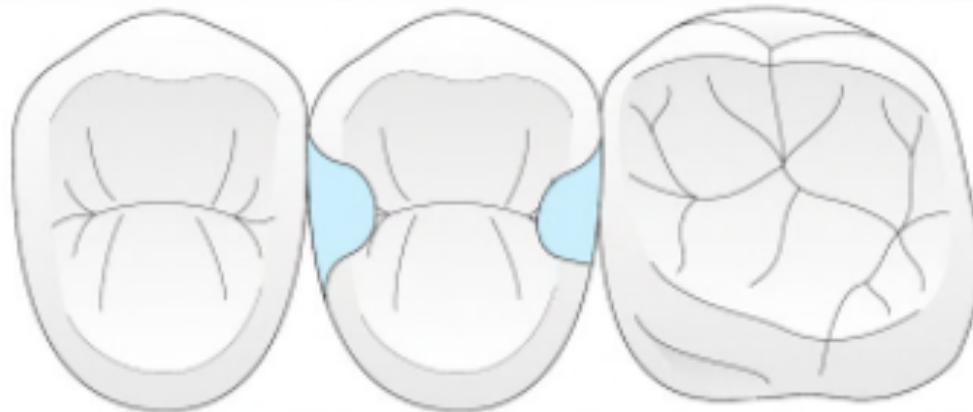
→ sufficient enamel quantity: bevel preparation

Insufficient enamel quantity:

gingival margin = no bevel buccal and lingual,
vertikal margin = 0.5 mm bevel



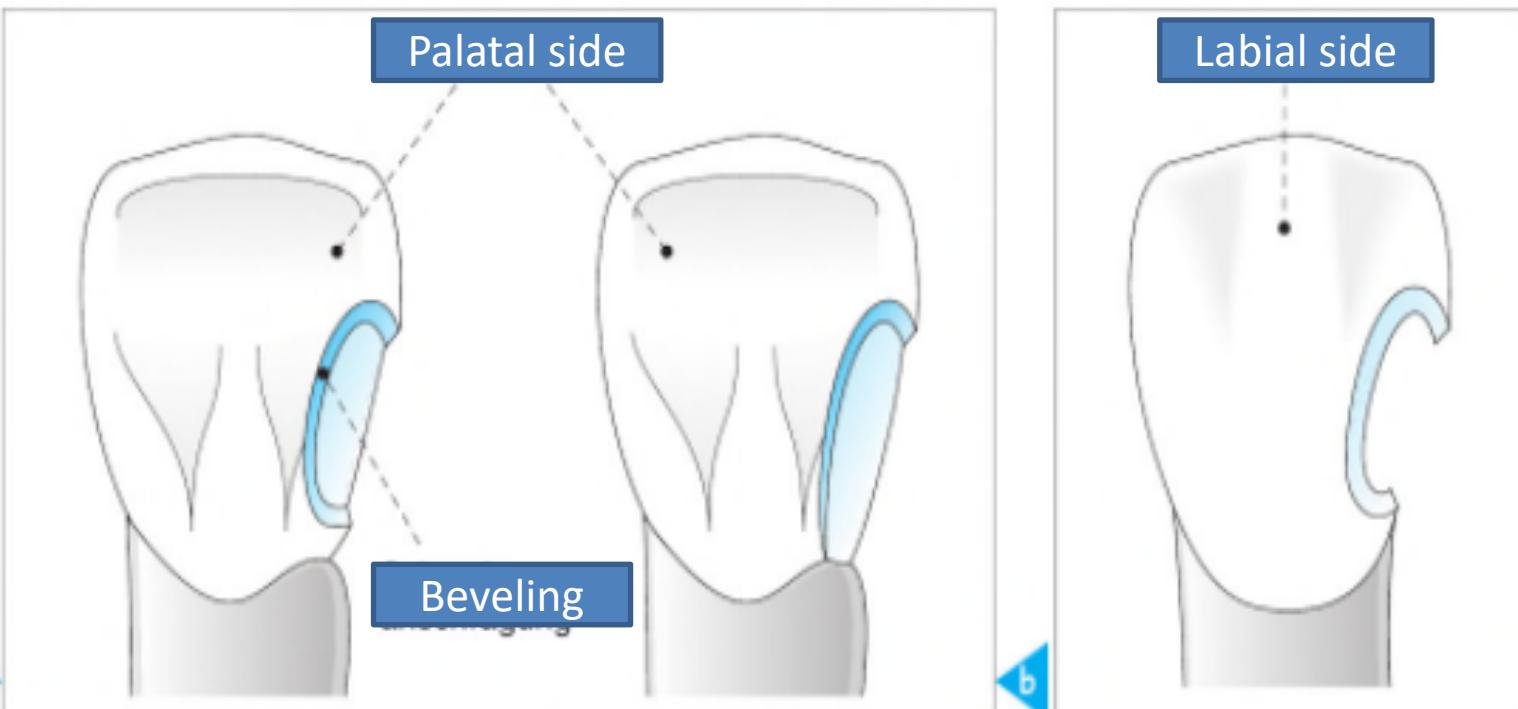
Class II: „Only box“ preparation



- In the case of small pure-proximal cavities, and a closed dental arch, a so-called only-box is prepared. The occlusal structure is fully retained. Approximal caries is opened from the occlusal surface.



Class III.



Class IV

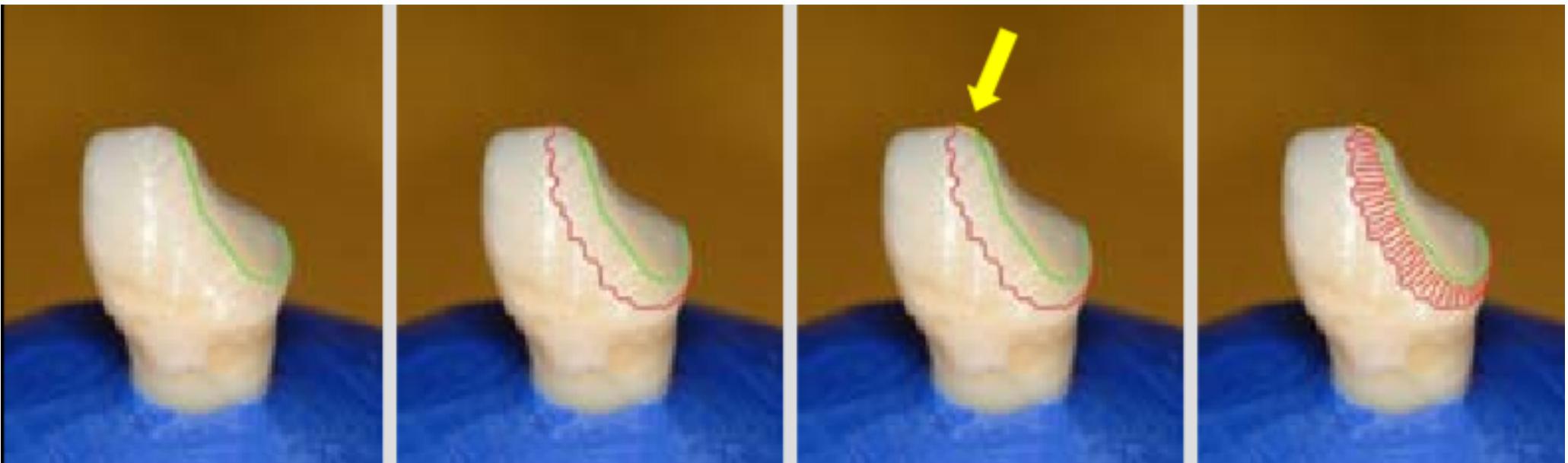


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Class IV

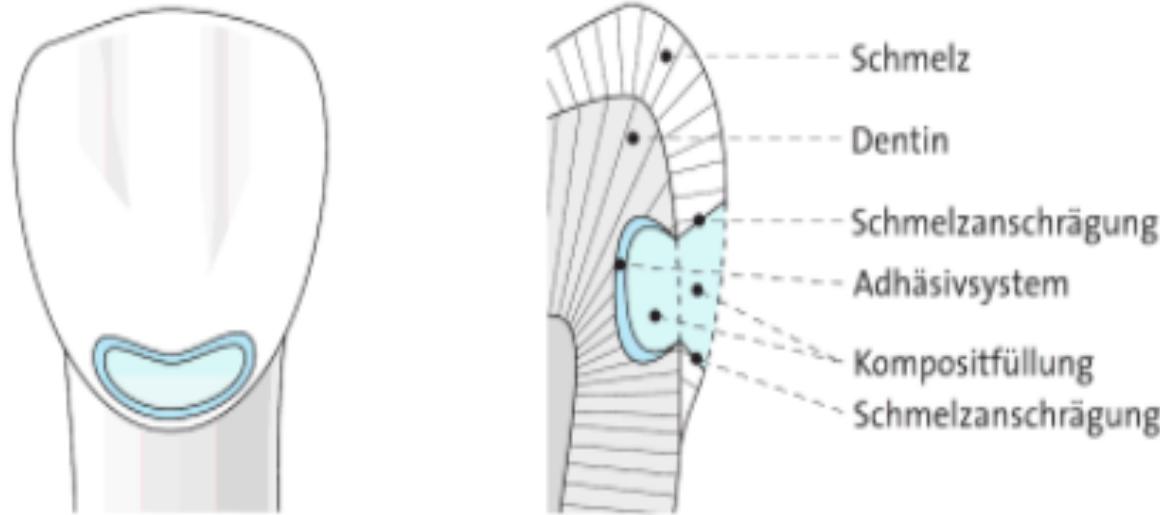


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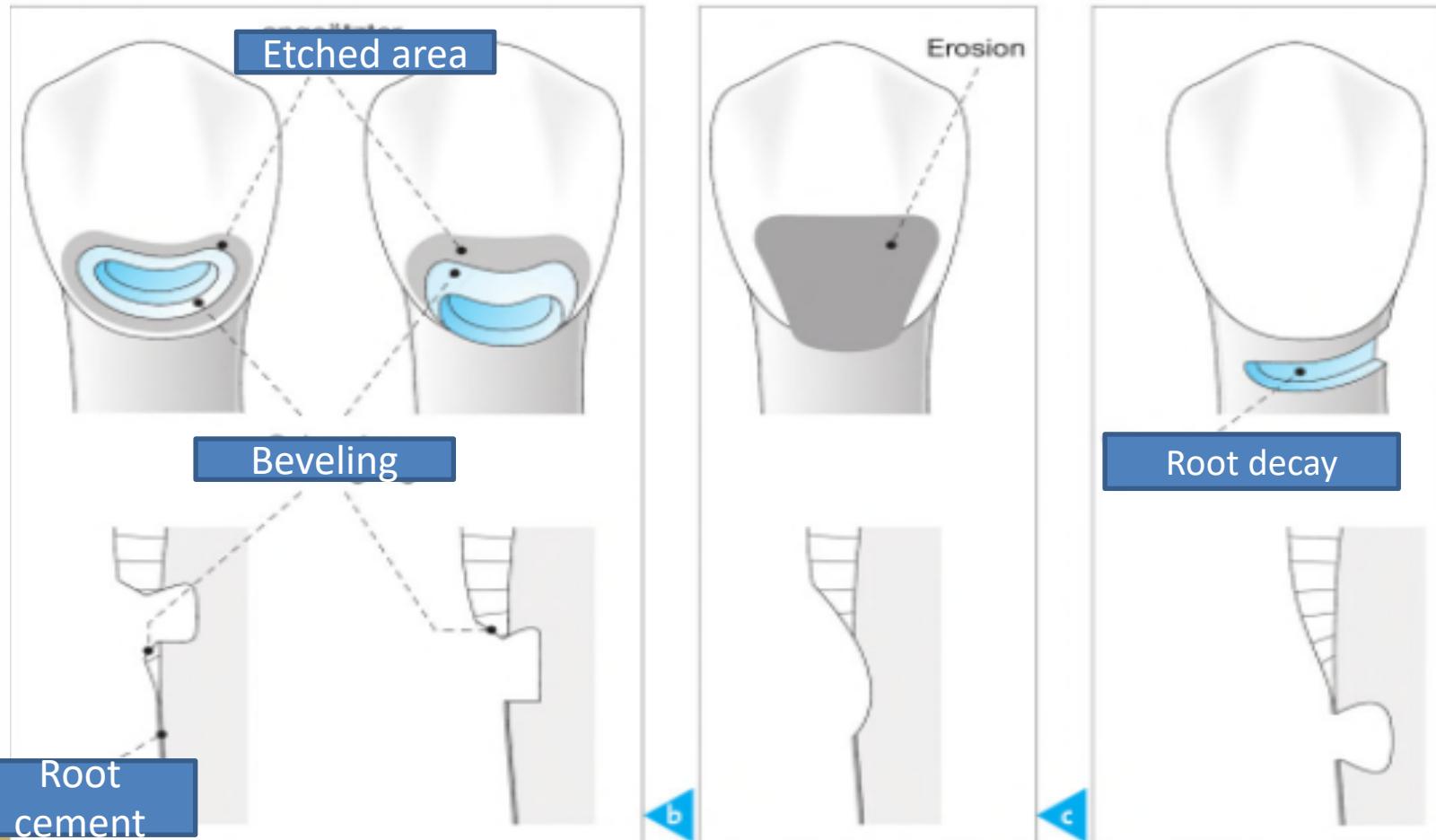
Class V



- ☞ The distance to the pulp in the tooth neck area is low. The cavity preparation therefore follows the curvature of the tooth surface. The primary cavity preparation is limited to a minimum. Usually only a caries removal is required. The outline form follows the spread of the caries and the course of the gingiva, the cavity is kidney-shaped.



Class V



Class VI.



On predilection surfaces



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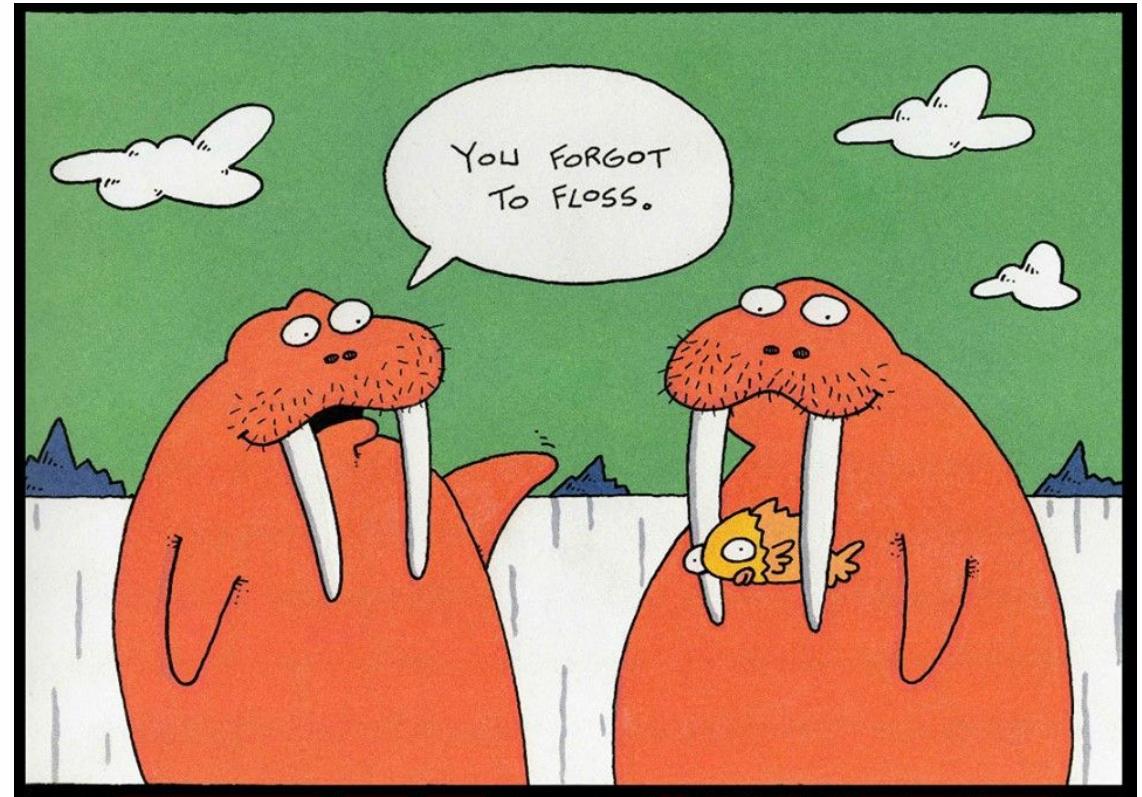
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Feedback:



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