ESTHETIC INLAY ONLAY OVERLAY

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INDIRECT RESTORATION

Cast metal
- Gold 22 karat
- Gold alloy
  - gold-platinum
- Silver-Palladium

Esthetic
- ceramik
- composit

metal-ceramik

gold-ceramik

Requirement

Adhesive-technic and Rubber dam isolation

Indication

- Esthetics
- Size of the defect
- Oral hygiene
- Root canal obturation
- Cusp fracture

Contraindication

- Haevy occlusal forces
- Deep subgingival preparation
- Small tooth crown, big pulp-chamber
- Cusp incline is steep(?)

ADVANTAGE

- Polymerisation shrinkage
- Physical properties
- Control of contact-point, and contour
- Biocompatibility

DISADVANTAGE

- Number of appointment
- Cost, and time
- Technique sensitivity
- Btittleness of the material

Type of CERAMIK indiret restoration accordomg to the manufacturing process

1. (Feldspatic porcelan) or Fired porcelan:
   Optec
   Inlay, fired on refractory die (master die)

2. Glass-ceramik
   „Lost-wax" casting process
   Dicor, Ceraperl (casted)
   Empress (pressed) (not centrifugeted)

3. CAD/CAM System: Computer Aided Designe/Computer Aided Manufacturing
   1986 Cerec (optical impression)

Type of composit inlay according to the manufacturing process

- **Direct method:** inlay is made into the mouth. Preparation, isolation of tooth, modellation, light-polymerisation, remove from the tooth, and second polymerisation (light+heat+pressure)

- **Semi-direct method:** (chair-side):not in lab, but next to the chair, but not into the mouth! Preparation, impression, but impression stay in office.

- **Indirect method:** Inlay is made in lab.

Type of composit inlay

1. First generation Laboratory Composit Resin: 1986
   Isosit 1986 (inhomogen mikrocomposit)
   low flexural strength(60-80 MPa),
   low resistance to wear, low % of
   inorganic filler

2. Second generation Laboratory Composit Resin:(mikrohybrid kompozit, nanohybrid kompozitok), filled polymers, polymer glasses…
   ArtGlass,Colombus, Belleglass Filtek Z 500, Gradia:
   f.s:120-160MPa, Filler:70-80% or more, different in form,size

Decision!

Indication, Contraindication, Advantage, Disadvantage

Cavity preparation

In the rules of preparation are small differences in case of ceramic and composit indirect restoration, therefore we speak about the preparation together!

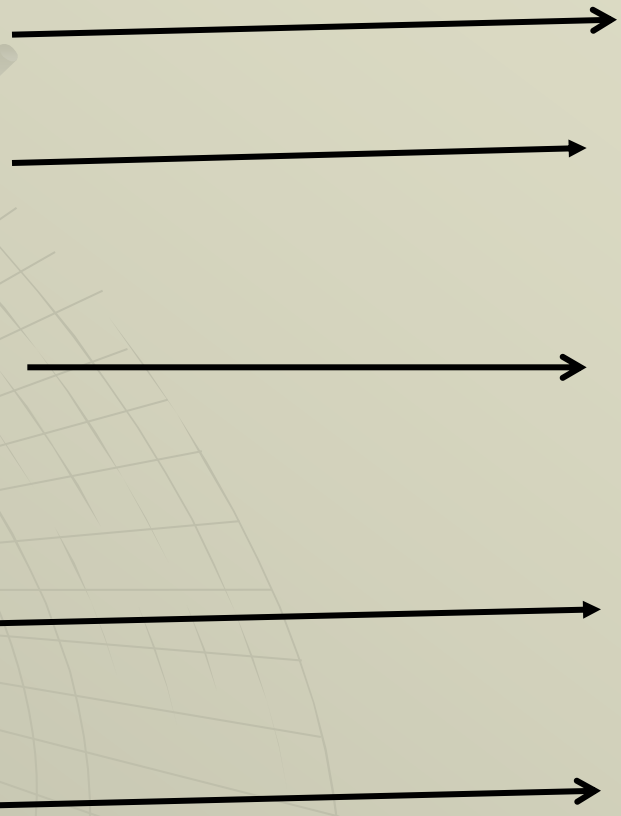
The technics follow the general rules of the cast metall restoration. Primer (initial) preparation (occlusal, proximal), secondar (final) preparation

Consideration of making inlay

Metal inlay

Esthetic inlay

- Most cases we have to remove more toothstructure.
- We can not leave big undercuts into the cavity.
- The contact with the neigbouring tooth has to be eliminate. (minimum distance of 0,5mm)
- The direction of place in is important. Orientation of the bur! MOD
- The contact with the antagonist tooth may not be at the cavosurface margin of the inlay.



Rules of making esthetic inlay

- The retention is not the friction . The retention is microretention! (Difference in luting material!)
- The cavosurface margins are not beveled!
- Avoid strong line angle and point angle
- „Secondary Retentionselement” are not or rare used.

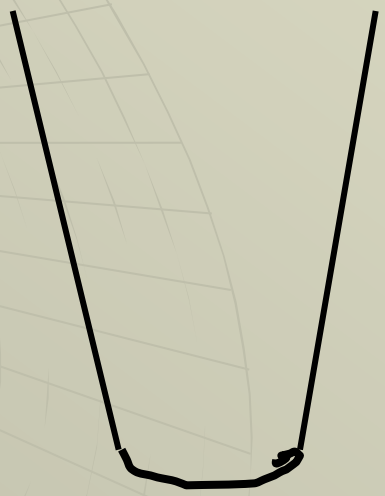
Primer (initial) preparation

- Instrument: Speed, Handpiece, bur
  Tapered fissure bur (hard metal or diamond)
  with slightly rounded angles

Conicity:

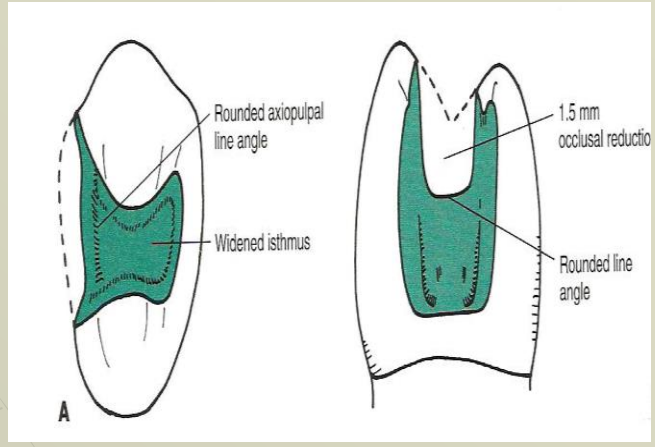
cast metal inlays 3-5°

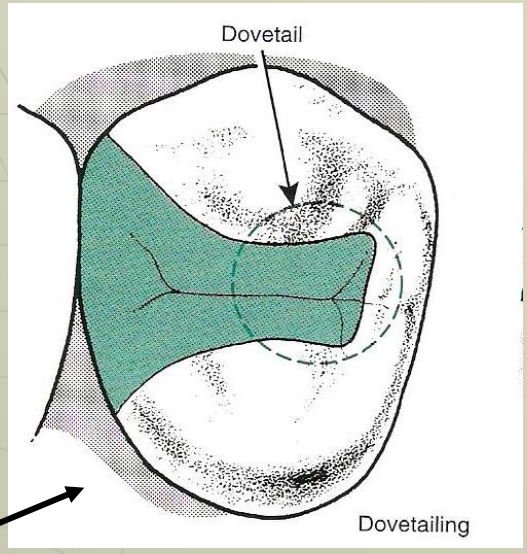
esthetic inlay 6-10°



Primer (initial) preparation for esthetic inlay

- **Depth:** of the cavity is 1,5- **2 mm.**
- **Width:**The occlusal extention is more.
- **Isthmus** is wider
- **Walls:** have to diverge in occlusal direction, more than in case of cast metal inlay **6-10°**.
- **Line and point angles** are rounded more.





Cast metal

Final (secondary) Preparation

- Removal of any remaining infected dentin and/or old restoration and Pulp-protection

- **Preparation of cavosurface margins.** Different
  - in occlusal cavity (at about 90°)
  - in proximal cavity
    - on the vestibulo-oral walls (60°)
    - on the gingival walls (straight)

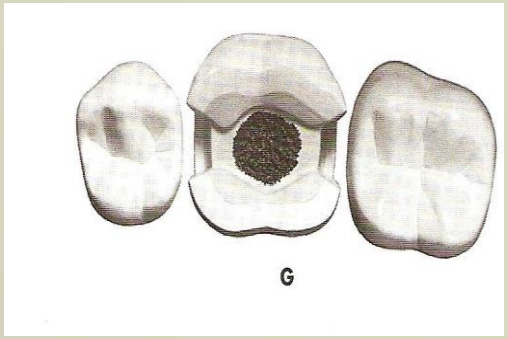
- Finishing the walls

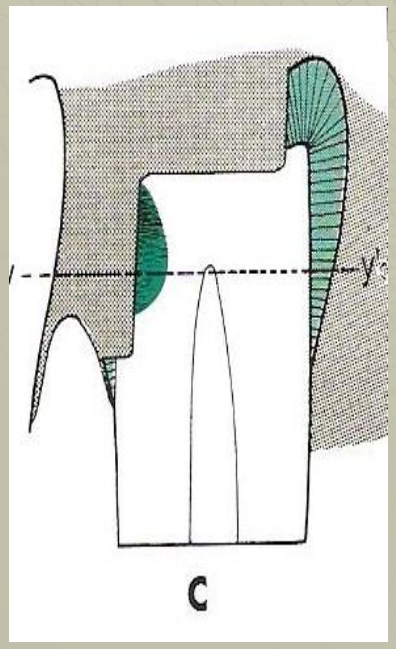
Final (secondary) preparation

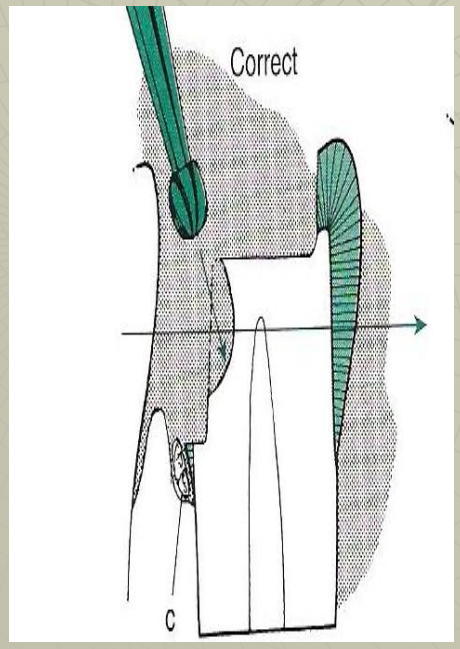
Removal of any remaining infected dentin and/or old restoration and Pulp-protection

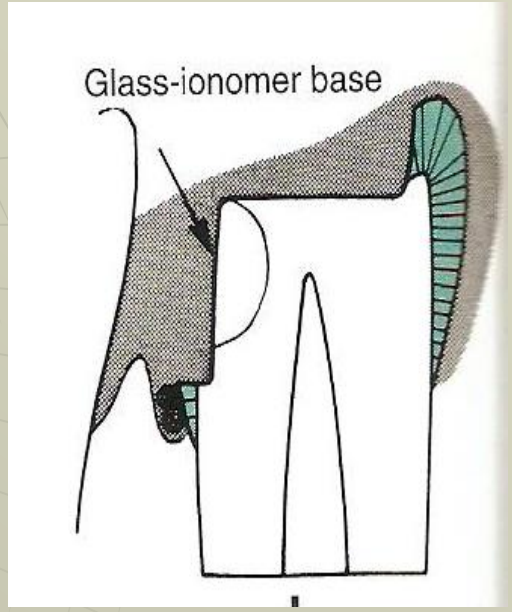
With round metallbur (hard or steel)

(Calcium-hydroxid)+ Glassionomer







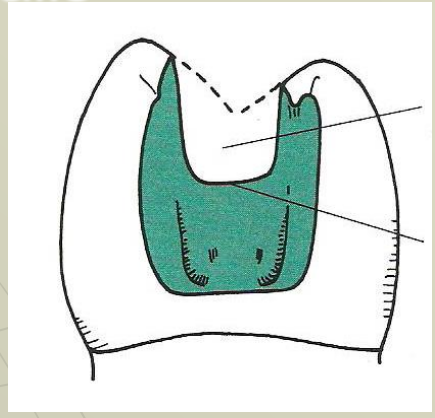


Final (secondary) preparation for esthetic inlay

Preparation of **occlusal** cavosurface margins.

Preparation of **proximal cavosurface margins**

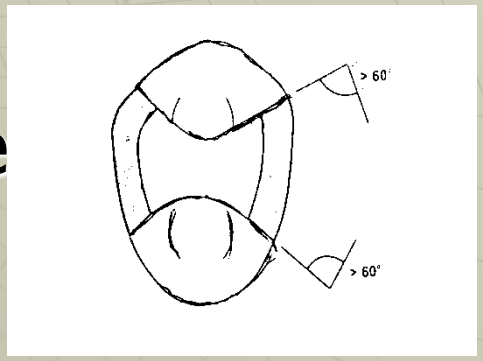
on the vestibulo-oral walls



-**Occlusal** cavosurface margins

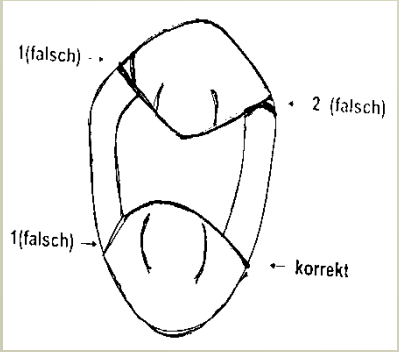
enamel at about **90°**

No bevelling!



-**Proximal** cavosurface margins

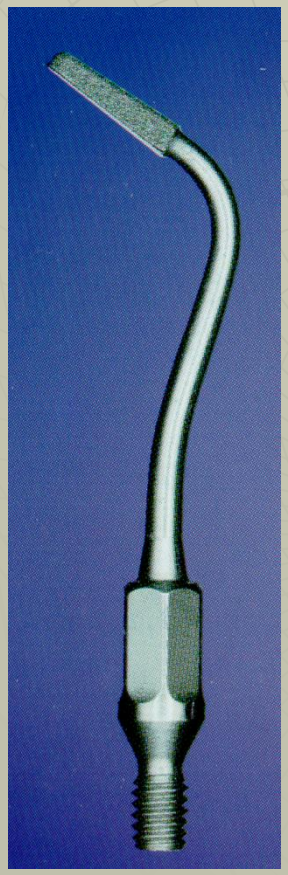
enamel at about **60°**



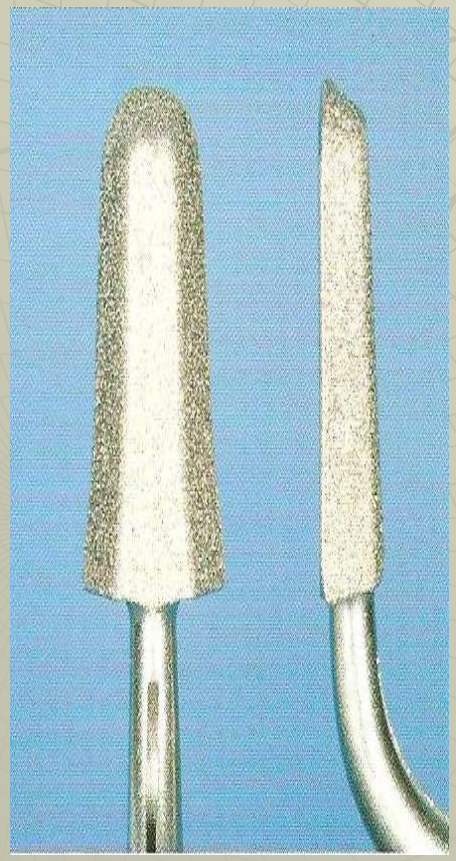
Final (secondary) preparation

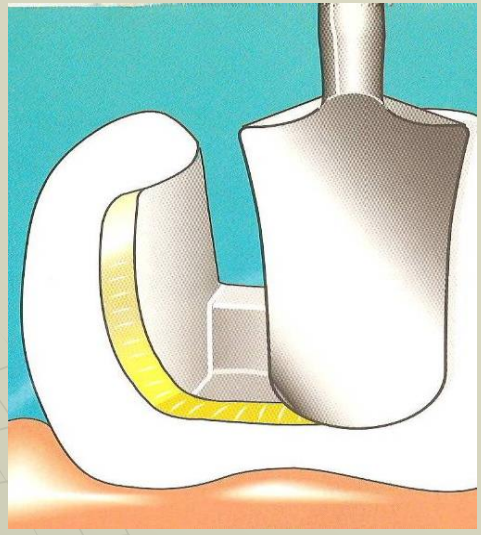
Preparation of proximal cavosurface margins on the buccale, linguale walls.

SONICflex 60˚



KaVo





the proximal cavosurface margins 60°, the gingival cavosurface margin 75°

The laterale and gingivale surfaces are rounded.

Preparation for esthetic onlay/overlay

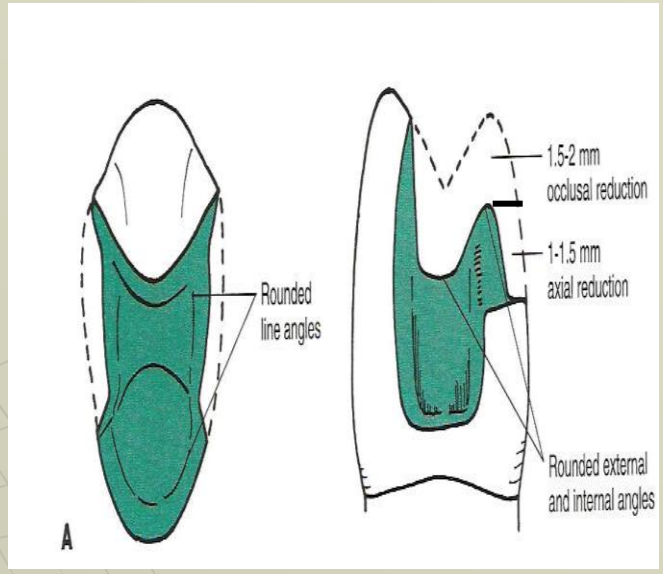
-Cusp reduction: 2 mm

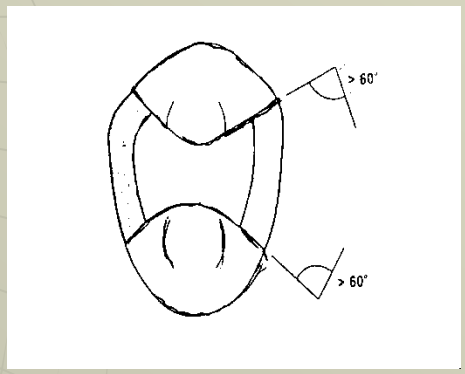
-No counterbevels or reverse bevel preparation

- Axial reduction : 1-1,5 mm

-Shoulder: without beveled

-Proximal preparation: 60°





The steps of making esthetic inlay /indirect method/

1. Shade selection, Preparation
2. Impression, Temporary filling
3. Tray-in
4. Cementation
5. Finishing, polishing

2. Impresson, temporary filling

What kind of impression?

What kind of temporary filling?

3. TRAY-IN WITHOUT PRESSURE

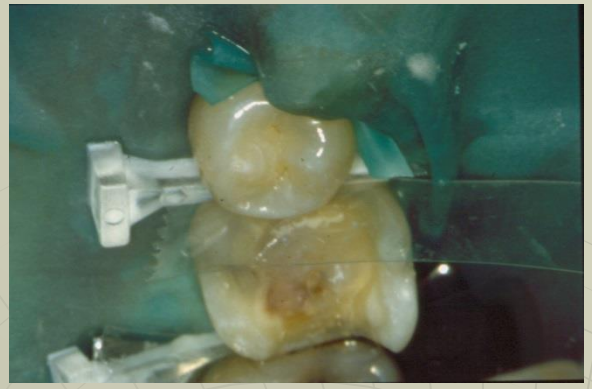
-check the cavosurface margin and

-check the proximal contact

NO OCCLUSAL KONTROLLE !

-wax (weaker)

-adhesive (stronger)



4. Fixation of inlay (cementation) /adhesive insertion /

Mikromecanical retention!

-Isolation: (absolut)rubber dam, plastic matrix strip, wedges, dental floss;

- Preparation of inlay: (inner surface)

depends on : ceramic or composit

-Preparation of tooth:

depends on the specific luting system

(acid etching, priming, bonding) setting!?

-Insertion of inlay:with resin cement

LUTING AGENT
(in case of esthetic restoration)

Nowdays: always (COMPOSIT) RESIN cement

-Viscositi:

- low-viscositi composit with konventionelle technic
- high-viscositi composit with USI or SI vibration can change the viscositi (ultrasound or sound tecnic) without water

-Setting: dual curing!

Glycerin-gel: for covering the surface of luting komposit! Oxigen disturbs the polymerisation of the last layer of komposit

Preparation of tooth:

depends on the specific luting system

1. „Etch-and rinse" (total) bond + resin cement **(dual-cured bond)**

   (RelyX ARC)

2. „Self-etch" bond + resin cement (Panavia F)

   (**dual cured bond)**

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3. „Self-adhesive" resin cements (self adhering cements used without application of any adhesive system)
   (SmartCem, RelyX Unicem G-Cem)

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Preparation of ceramic inlay

-Sandblasing in the laboratorium

-HF acid : for fired ceramic

1-2 minutes for the inner surface of inlay

remove with water

Concentration of HF acid:4-10 %

-Ammoniumbifluorid: 10 % remove with water

Glas ceramic

Dicor, Empress

-Silan: helps the contact between the ceramic and luting cement (ceramic-**silan**-resincem-**bond**-tooth)

Preparation of composit inlay

- This can be different depending on the used composit material
- Roughened the surface
- Sandblasing in the laboratorium
- HF acid: Belleglass
- Not HF acid:Gradia

5. finishing, polishing

Checking the occlusion now!

When, and how to remove the excess luting material?

Finishing:

-fine grit diamant instrument (yellow, white)

-16-30-40 fluted carbide burs

Polishing:

-rubber

-polishing paste

Accuracy of inlay

The weekest point of inlay is the cavosurface margin

- Cast metal: 20-50 µm
- Ceramic: 40-80 µm
- Composit: 40-100 µm

Adhesivtechnik and Rubberdam-application