

Fillings made by an indirect procedure

Types of fillings: inlay, onlay, overlay - used to reconstruct part of the crown. Inlays, onlays and overlays belong to fixed crown restorations.

Making

1. Direct - in the patient's mouth;
2. indirectly - in the laboratory (CAD-CAM technique);
3. milling with NC machines - the interface between direct and indirect processing.

Inlay

Inlay is a purely intracoronary fixed filling, cavities I. and II. classes.

Onlay

An onlay replaces one bump. It can also be part of smaller bridges.

Overlay

An overlay is a replacement for at least two (usually all) cusps of a tooth. Both occlusal surfaces, which form a smooth transition to the semi-crown, are included in the preparation.

Indication

1. Medium-sized cavities I. and II. classes – the approximate defect crosses the cemento-enamel border;
2. strongly weakened bumps with the risk of breaking off;
3. excellent oral hygiene of the patient;
4. low caries teeth;
5. healthy or treated periodontium;
6. functional therapy – reconstruction of the occlusal field (e.g. after endodontic therapy).

Advantages

longer service life, holds its shape better - mechanical resistance.

Disadvantages

it is necessary to remove a larger amount of hard dental tissues.

Indication of non-metallic fillings

- Medium and large defects I. and II. classes – mainly for premolars (esthetics);
- overlay of endodontically treated teeth;
- class V cavities;
- excellent oral hygiene of the patient.

 **CAVE** when terminating the cervical margin in cementum or dentin a good connection is not guaranteed!

Contraindications of non-metallic fillings

- Parafunctions (eg bruxism);
- lack of remaining dental tissues;
- strongly colored dental tissues;
- too short crowns;
- too small defects;
- do not indicate clasp teeth - for retention of clasp removable prosthesis.

Preparation

Metal fillings

Occlusal inlay

- First class cavity;
- cavity width = max. $\frac{1}{2}$ buccolingual distance between cusps;
- cavity depth = min. 1.5 mm;
- shape = box-shaped, main fissures occupied;
- walls slightly divergent (3° to 6°), in deeper cavities the upper $\frac{1}{3}$ more divergent;
- all inner edges are rounded, the bottom of the cavity is straight, no undercuts;

- beveled occlusal edges (not performed for deep cavities);
- antagonist contacts must never be on the filling-tooth border - either on the enamel or on the filling;
- primary preparation - cylindrical/slightly conical diamond grinding wheel with a straight face;
- slight taper - so that the filling can be inserted, but to ensure sufficient retention;
- veneering of the walls and bottom - diamond veneers of the same shape;
- pad - GIC, cement with Ca(OH)_2 - leveling of the bottom (after removal of softened dentine) and sub-curves.

Inlay II. classes - double-sided

- The extent of the approximal cavity is governed by the extent of the carious defect;
- sufficiently cancel the contact area with the adjacent tooth;
- wall divergence - flat cavities of about 10° (deep more);
- extension surfaces - divergence to occlusion, ideally 40° with the outer wall of the tooth;
- gingival step - supragingivally, width = min. 0.8mm;
- forming the edge - approximate part of the cavity + extension surface;
- a cabinet with a rounded step;
- cabinet with cervical bevel - do not bevel the edges of the extension surfaces, align them with a hand tool;
- cabinet prepared with sanding discs - not used today, extension too high;
- prophylaxis of kazu (joints) - preparation for a rounded step;
- step preparation with beveled step (bevel $30-45^\circ$);
- retention - dovetail occlusal preparation - additional retention elements (anchoring with a pin).

 **CAVE** must always be a clearly visible border of the preparation!

Three-layer (MOD) inlay

- Width - must not be more than 1/3 the distance of the CAVE bumps! rupture;
- the retention area is sufficient - these inlays usually hold very well.

Onlay

- For molars and premolars;
- reduction of the occlusal area by 1 mm;
- as for an overlay - without a step, do not grind the bumps from the outside.

Overlay

- For molars and premolars;
- start of preparation - as on MOD inlay;
- in occlusion of loaded bumps - step preparation with beveled edges;
- step - width 1 mm;
- border of preparation = equator of the tooth (we include all buccal and lingual fissures and furrows - plaque retention);
- tools - conical diamond grinding wheels and veneers or thin flame diamond veneers;
- in the occlusion of an unloaded tubercle - the preparation smoothly transitions to the outer surface of the tubercle.

Non-metallic fillings

- Gross dissection - removal of carious matter;
- according to the rules for cast metal fillings;
- cancel approximal contact - extension surfaces, gingival step;
- difference = no chamfers (just round internal corners);
- leave the edges of the cavity easily accessible (hygiene);
- border in enamel (adhesive cementation);
- dimensions - occlusion cavity - 1.5 mm depth and width;
- approximal cavity - step width min. 1.5 mm;
- extension surfaces must not make a sharp angle with the tooth.

Imprinting

- Supragingival preparation - just dry the working field;
- equigingival (paringingival) or subgingival preparation - retraction fiber into the sulcus (to maintain a dry working field and for a more faithful impression), or electroplating;
- material: silicone materials, polyether impression materials.

A-Silicones

 For more information see *Elastomers*.

- Imprinting in ready-made spoons (if necessary, treat it with thermoplastic);
- double mixing method.

Polyethers

 For more information see *Elastomers*.

- Imprinting in individual spoons;
- single-phase method (monoprint).

Casting

- Special super-hard gypsum (denzite, class IV);
- it is advantageous to make 2 working models – one for modeling the work, the other for checking the approximate surfaces of the finished filling;
- after the impression, we put a temporary filling - preferably with a stamp technique (stamp - silicone impression - we remove it before the preparation).

Testing and Sealing

composite (for ceramic and plastic restorations) and zinc oxide phosphate cement and GIC (for metal restorations) are used for cementation.

Metal cast fillings

- Rough polishing – before the test in the mouth, do not polish the occlusion and approximal surfaces;
- test – without anaesthesia, the patient is sitting (prevention of swallowing/aspiration of the substitute);
- approximal surfaces – test with dental floss, matrix strip;
- how it sits in the cavity - silicone test;
 - apply thin silicone to the inner surface of the filling and place it in the cavity;
 - after removing the filling, the inner surface must be covered evenly with a thin silicone film;
 - obstacles that are uncovered (spots of shiny metal) - occlusion and articulation;
 - articulation paper;
- final polishing – in the laboratory, to a high gloss;
- caulking – zinc oxide phosphate cement – pressure resistant, minimal gap;
 - GIC;
 - removal of excess cement, final check of occlusion and articulation;
- the lifespan of metal fillings is 10-15 years (or longer).

Non-metallic fillings

- We will remove the provisional and any remaining cement;
- checking accuracy and color;
- test – we introduce the filling carefully, without pressure;
- accuracy - silicone test;
- approximate contacts, marginal closure (with a sharp probe);
- occlusion check is not yet performed;
- enjoy cofferdam necessary absolutely dry and clean work area !!!;
- inlay treatment on the inside – better bond to composite cement;
- composite inlay – sandblasting, roughening with veneer;
- ceramic inlays - etching with a special acid, silanization, larger surface - better wetting;

 CAVE must not contain any contamination of the retention surface!

Links

References

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