

Restorative dentistry III.
solution of defects in posterior
teeth addition

Alternative to amalgam

Subgingival defects

Alternative to the amalgam filling does not exist

Fast application

Excellent mechanical properties

No sensitivity to moisture

Social filling

Comparison of permanent filling materials – mechanical properties

	<u>Compressive strength MPa</u>	<u>Flexural strength MPa</u>
• Composite	150	100
• Glassionomer	80	25
• Amalgam	500	30



Bulk fill - materials that can be cured in the thicker layer

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Higher translucency

- 2. More photoinitiators
- 3. Some of them are dual cured
- 4. Some of them have short fiber filler

Application can be faster:

Thicker layer – no more than 3 mm !

Polymerization shrinkage and stress are lower but still exist!

Review

Bulk-Fill Resins versus Conventional Resins: An Umbrella Review

Gonçalo Silva 1, Carlos Miguel Marto 1,2,3,4,5,6 , Inês Amaro 1,2,3,5,6, Ana Coelho 1,2,3,5,6 , José Sousa 1,2, Manuel Marques Ferreira 2,3,5,6,7 , Inês Francisco 2,3,5,6,8 , Francisco Vale 2,3,5,6,8 , Bárbara Oliveiros 2,3,5,6,9 , Eunice Carrilho 1,2,3,5,6 and Anabela Baptista Paula 1,2,3,5,6,8,*

- They present greater translucency and, consequently, better light dissipation in the composite resin, with photo initiators allowing a greater polymerisation depth and polymerisation modulators allowing for less polymerisation shrinkage. Bulk-fill resins can be categorised into two groups, base with low viscosity and full body with high viscosity, depending on the purpose for which they are used, namely the restoration type and its mechanical requirements. The first group, having a low viscosity, is easy to sculpt and can be sonically activated to become more fluid and more easily adaptable to the cavity walls. Normally, the application of flowable bulk-fill resins can be carried out using a syringe, since they are characterised by their high fluidity. Thus, the application is simpler, allowing use of the composite resin in cavities that are more difficult to access. However, this type of composite resin is often associated with low strength, and it is necessary to cover it using conventional composite resins, thus hiding the more transparent aspect of the restoration by bulk-fill composite resins.

Comparison:

Overall, although without statistical significance, the confidence interval for the OR (odds ratio) is most favourable to the use of conventional resin, as it is about five times more likely to obtain a good result with conventional resin than with bulk-fill resin.

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- (odds ratio) is most favourable to the use of conventional resin, as it is about five times
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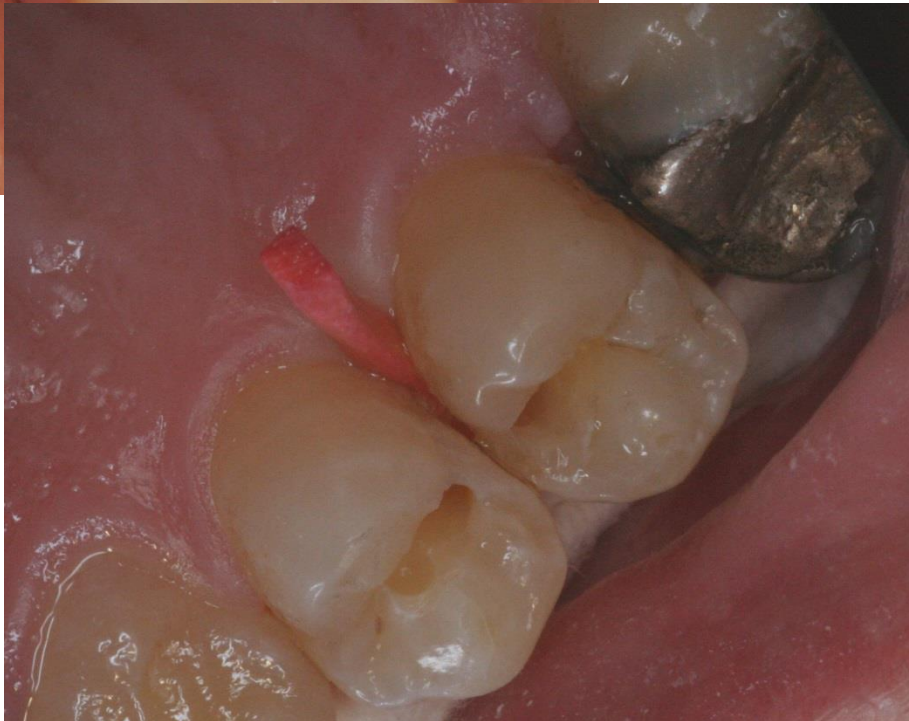
Bulk fill - materials that can be cured in the thicker layer

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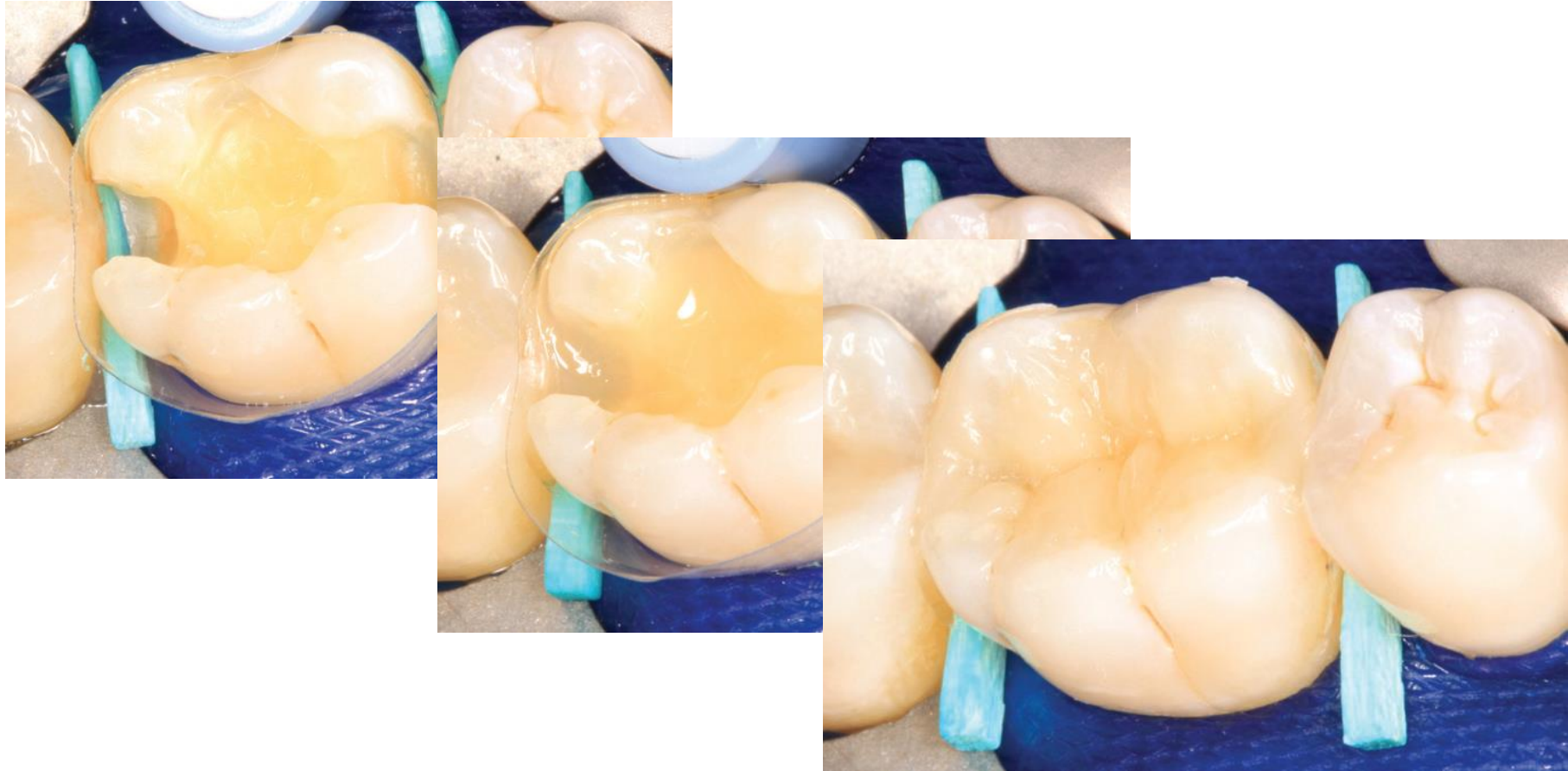
1. Flowable materials –
 - Good marginal adaptation, usually necessary to use the conventional composite material on the top
- 2. Condensable composit materials – in combination with flowable
- 3. Sonic materials (Sonic Fill) – thixotropy, the viscosity is decreased by vibrations.

Sonic Fill













Problems of bulk fill materials

- Lower aesthetics
- Polymerization stress lower
- Adhesion procedure must be kept
- The depth of the cavity must be measured

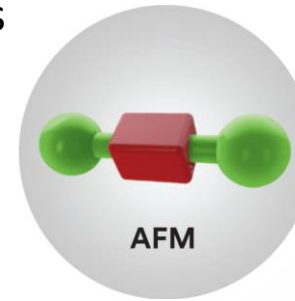
New materials on the base of composite

- Chemically cured with the possibility of light curing
- Releasing ions F, Ca, OH (Alkasit)
- Self curing primer

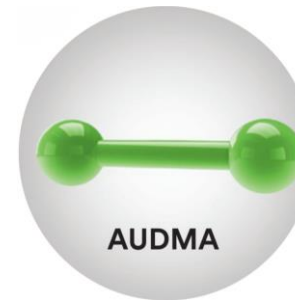


Technology One bulk

The molecule of the monomer is splitting – lower polymerization stress



Long monomer AUDMA lower polymerization shrinkage



Main problems

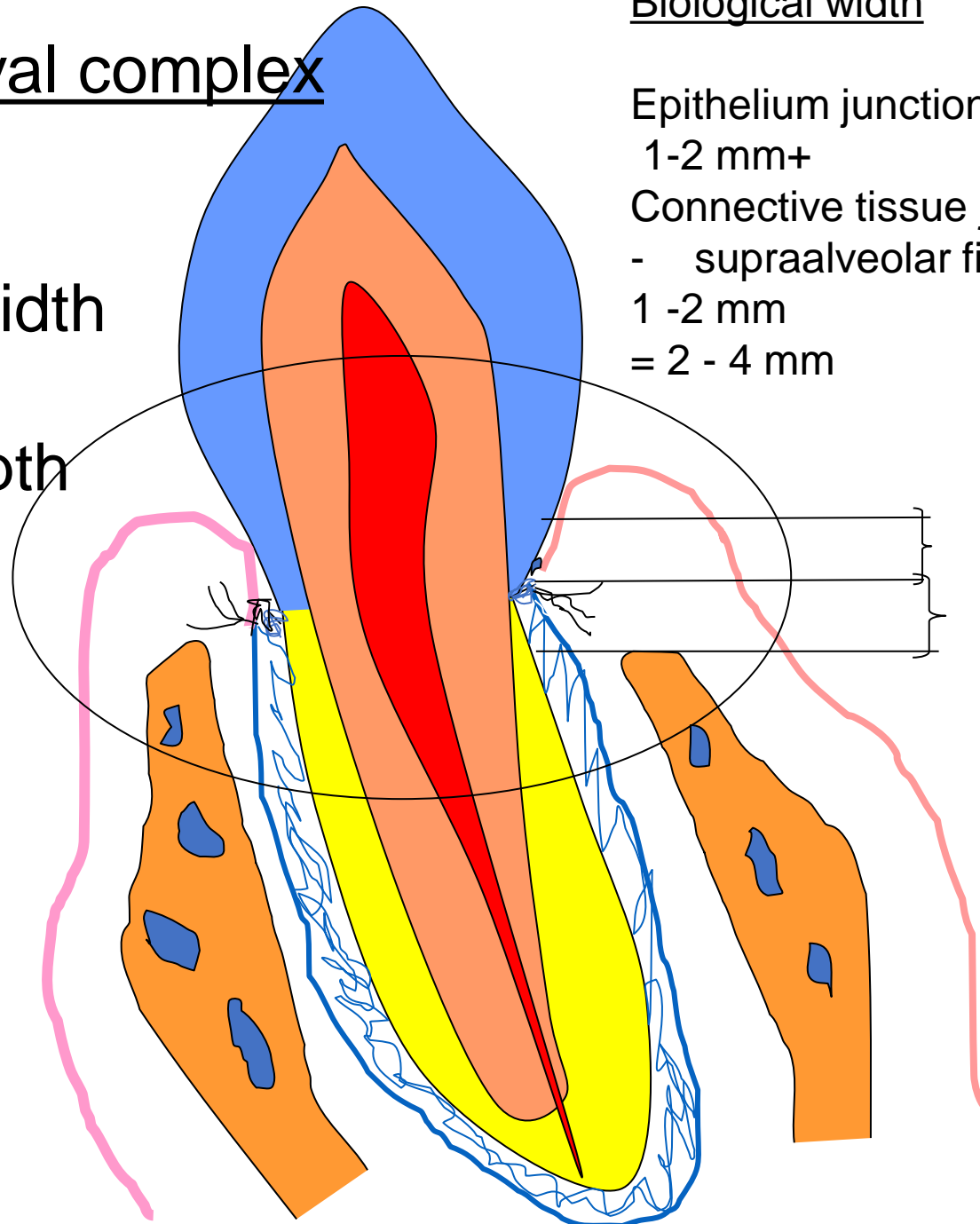
- Substantial loss of hard dental tissues
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- Subgingival cervical borders – difficulties with dry operative field
- (bleeding, sulcular liquid)
- Adhesive procedures in region without enamel
- – consider selfetching adhesive

SUBGINGIVAL DEFECTS

- Technical parameters:
- Possibility to keep the operating field dry
- Biological parameters: measurement of distance between clean gingival border and insertion of periodontal ligament or crest of alveolar bone using periodontal probe and/or xray.
- Biological width

Dentogingival complex

DGC =
biological width
2-4mm +
sulcular depth
1-3mm
= 3-7 mm



Biological width

Epithelium junction

1-2 mm+

Connective tissue junction

- supraalveolar fibers

1 -2 mm

= 2 - 4 mm

1 - 2 mm

1 - 2 mm

*Gargiulo AW, Wentz
FM, Orban B
(J Perio 1961)*

*Vacek JS, Gher ME,
Assad DA,
Richardson AC,
Gambaressi LI
(Int J Perio & Rest
Dent 1994)*

Lesion type 1

- Lesion does not reach cemento enamel junction
- No pulp exposure
- Gingival wall is located supragingivally:

- Rubberdam and composite filling

Lesion type 2

- Lesion does not reach the cementsoenamel junction
- Pulp is involved
- The gingival wall is located supragingivally
- Pre - endo, endo, postendo

Lesion type 3

- Lesion does not reach the cementoenamel junction
- Dental pulp is involved
- The gingival wall is located subgingivally
- Gingivectomy, preendo, endo, postendo

Lesion type 4

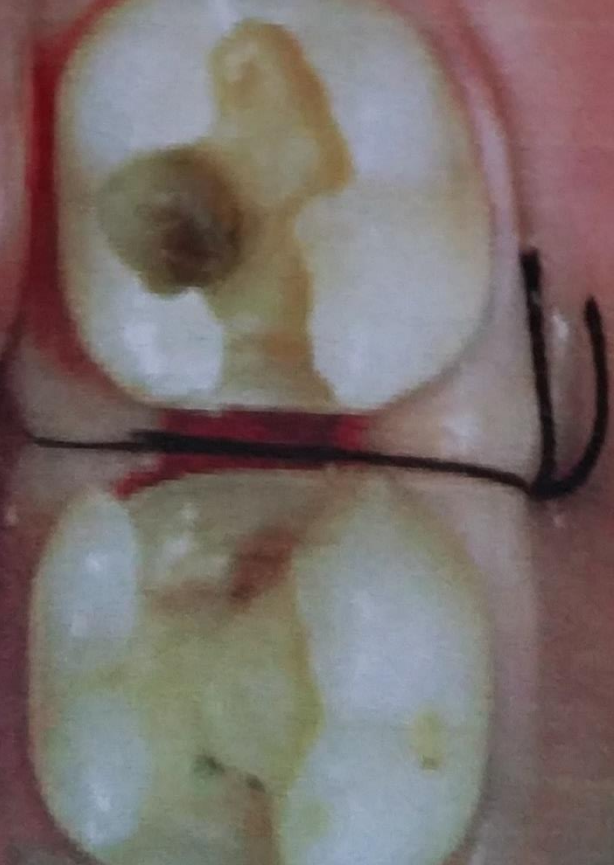
- The lesion is on cemento enamel junction
- Dental pulp involved
- The gingival wall is located intrasulculary

- Osteoplasty, gingivectomy, rubberdam, preendo, endo, DME, postendo

Lesion type 5

- The lesion is below cemento-enamel junction
- Dental pulp is involved
- The gingival wall is located in the bone

Ostectomy, preendo, endo DME, postendo



Classification of subgingival defects

- 1. Rubberdam is possible to use, gingival border can be seen.
- 2. Rubberdam does not allow complete isolation of operating field, biological width is ok.
- 3. Subgingival defect, biological width is affected.
- 4. Intraosseal defect

Solution

- 1. Margin elevation – cervical margin relocation using flowable material or composite filling material
- 2. Gingivectomy + gingivoplasty
- 3. Elongation of clinical crown – crown lengthening (gingivectomy + ostectomy)
- Reconstruction: direct or indirect

Cervical margin relocation

- SEQUENCE OF OPERATION – MARGIN ELEVATION •
- Consider possibility of effect of rubberdam and biological width •

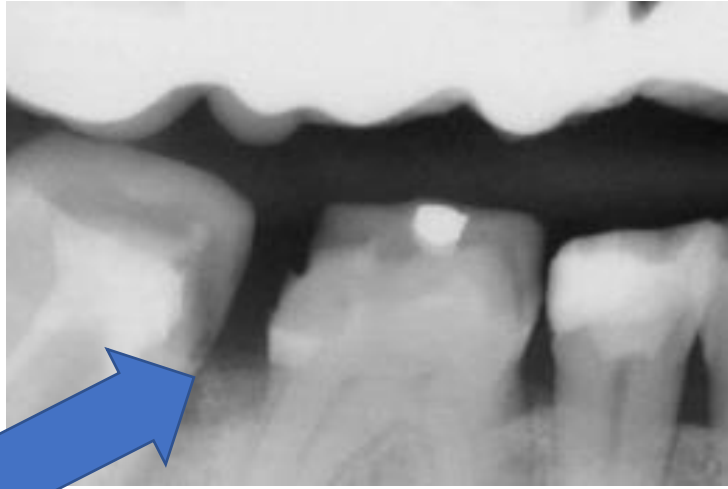
Cervical margin relocation

- Matrix band – can be cut (appr.3 - 5 mm)
- Tightening of the matrix with the retainer
- No wooden wedge

- Adhesive procedure consider selfetching adhesive system
- Flowable
- Composite







New margin



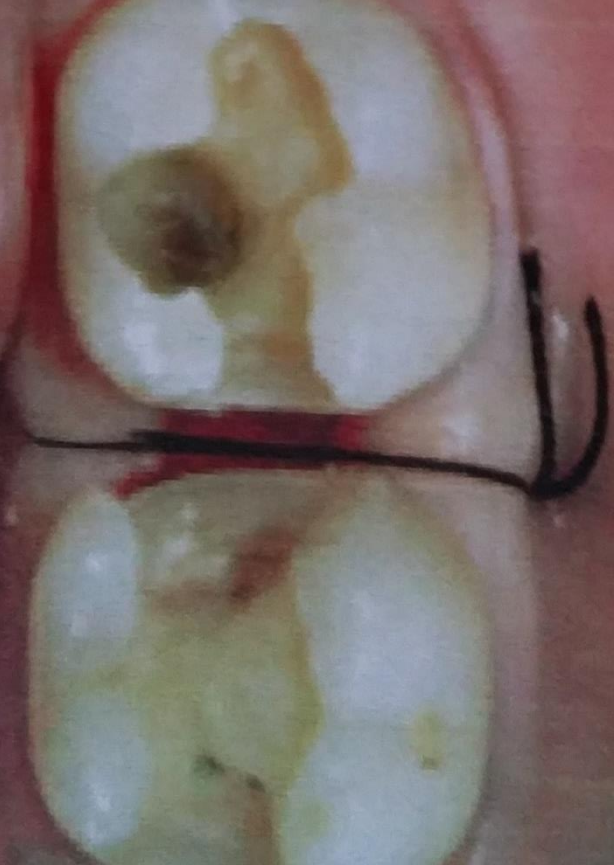
Gingivectomy and gingivoplasty

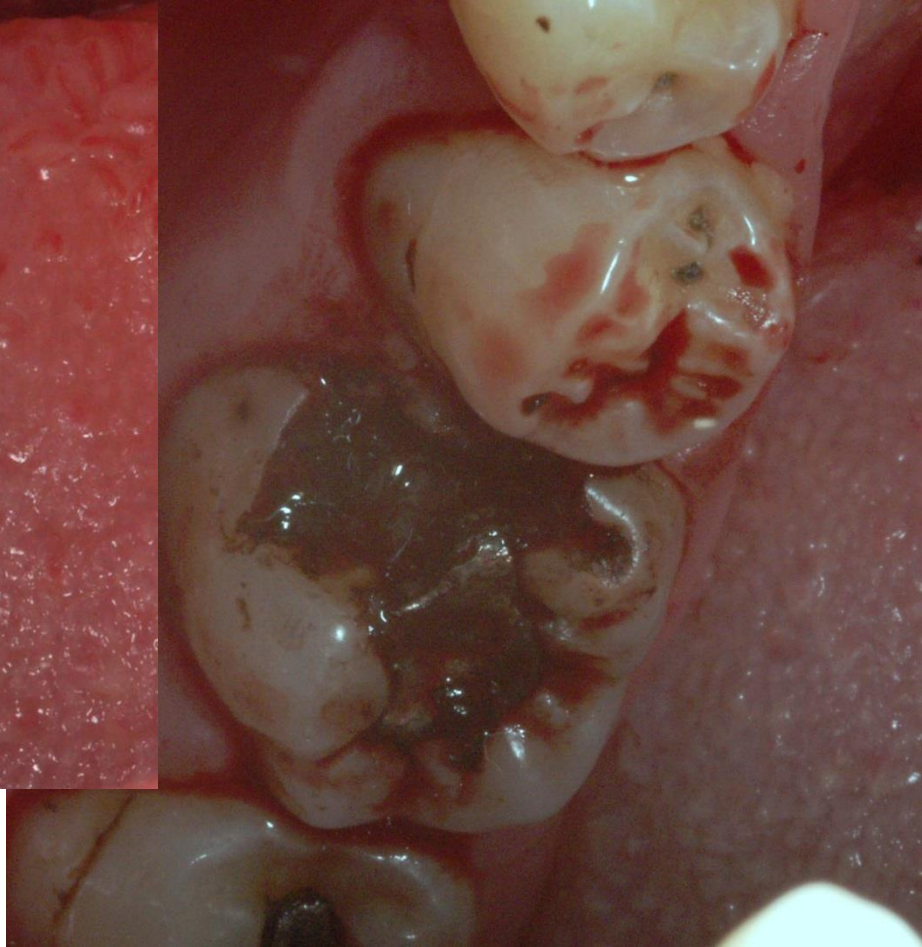
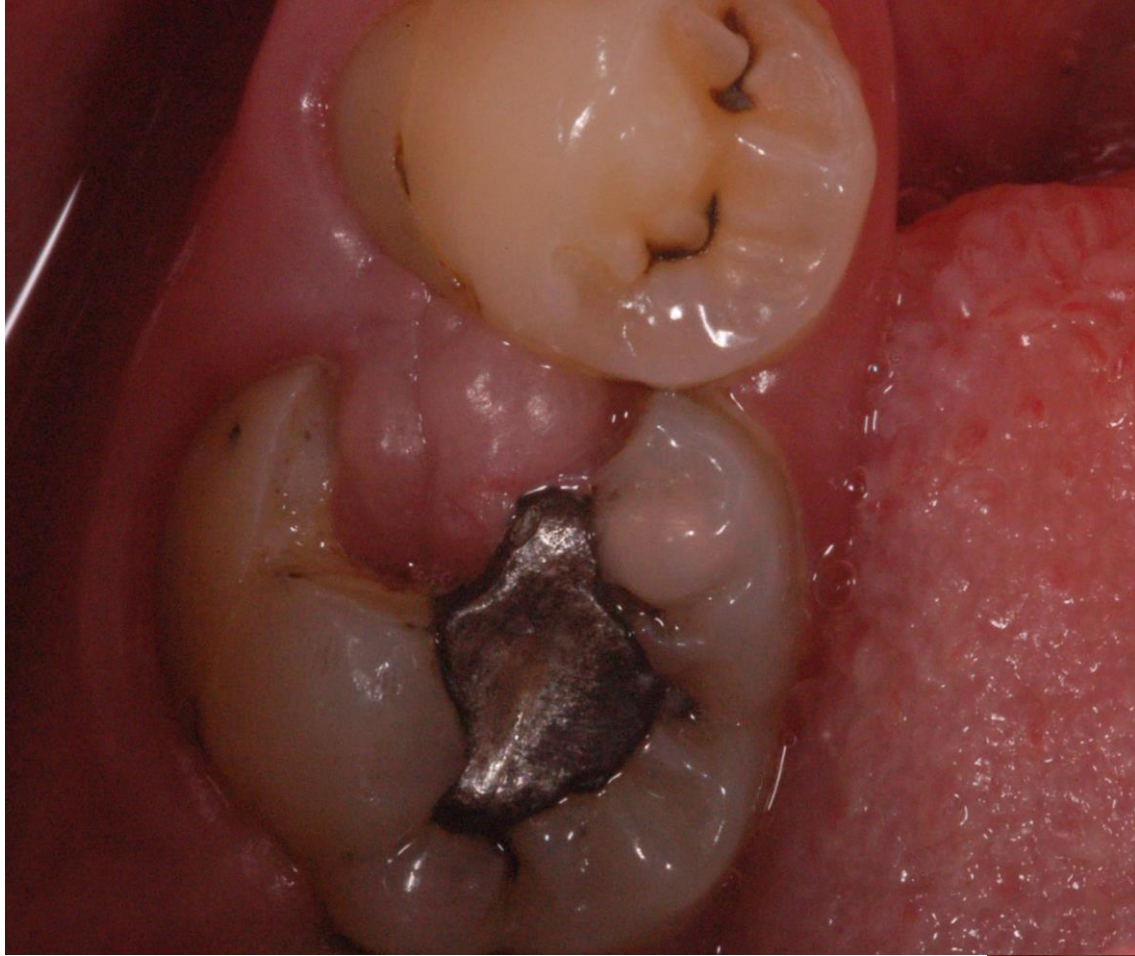
- Cutting gingiva and shaping it anatomically :
- Scalpel - Laser - Cauter

Gingivectomy Gingivoplasty



GIC as a temporary





Crown lengthening

- Surgical procedure based on gingivectomy, gingivoplasty and ostectomy.
- Closed and open



Extrusion

- Extrusion orthodontic
- Fast
- Surgical

