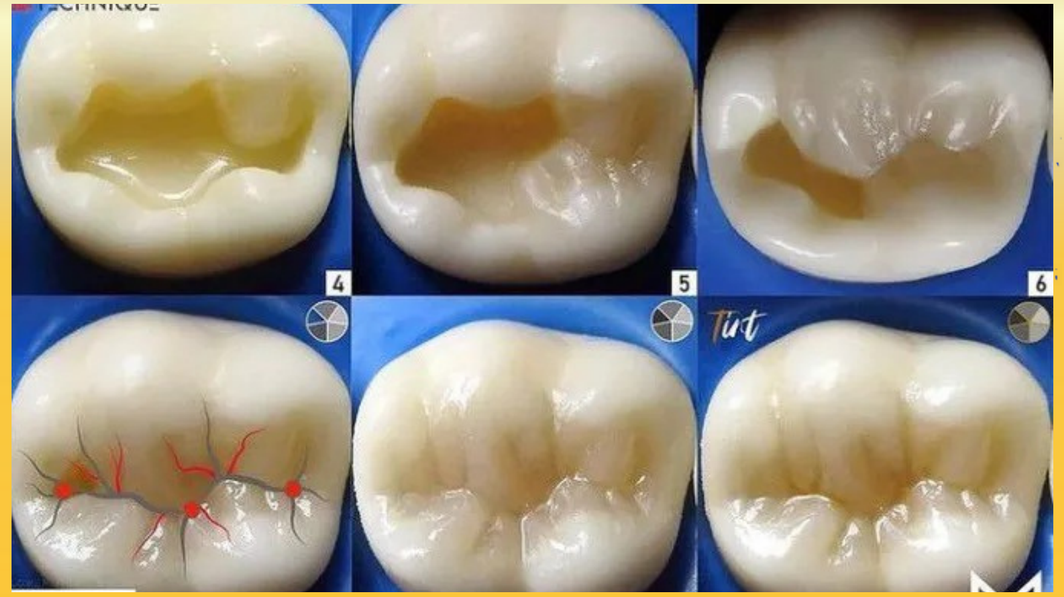
www.caapidsimplified.com

COMPOSITE RESTORATIONS



CAAPID
Simplified
Demystifying Dental Admission

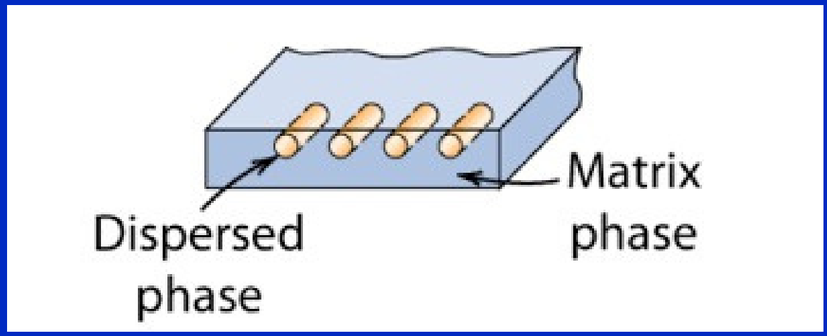
Agenda

- Introduction
- Composite classification
- Composition and types
- Class II, III, IV, and V restoration procedures
- Stamp technique
- Criteria for evaluation of preparation Tips and tricks

Introduction

- A solid formed from two or more distinct phases that have been combined to produce properties superior to or intermediate to those of individual constituents

- They generally have two steps:



- Matrix phase: encloses the composite and gives its bulk form.
- Dispersion phase: determines the internal structure of composite, and it is bonded to the matrix phase

Indications

- Class I, II, III, IV, V, VI
- Core buildups & Inlays
- Sealants and preventive resin restorations
- Esthetic enhancements procedures
- Cement, & Temporary restorations
- Veneering metal crowns/bridges
- Periodontal splinting
- Enamel hypoplasia
- Repair of old composite restoration
- Patients allergic to metals

Contraindications

- Where isolation is impossible Traumatic occlusion
- Subgingival area/root surface Poor oral hygiene
- High caries index
- Habits (Bruxism)
- Compromised Operator abilities

Advantages

- Conservative
- Less complex
- Used almost universally
- Strength
- Bonded to tooth structure
- Repairable
- No corrosion
- No health hazard
- Cheaper than porcelain

Disadvantages

- Polymerization shrinkage
- Technique sensitive
- Higher coefficient of thermal expansion Difficult, time-consuming
- Increased occlusal wear
- Low modulus of elasticity
- Lack of anticarcinogenic property Staining
- Costly

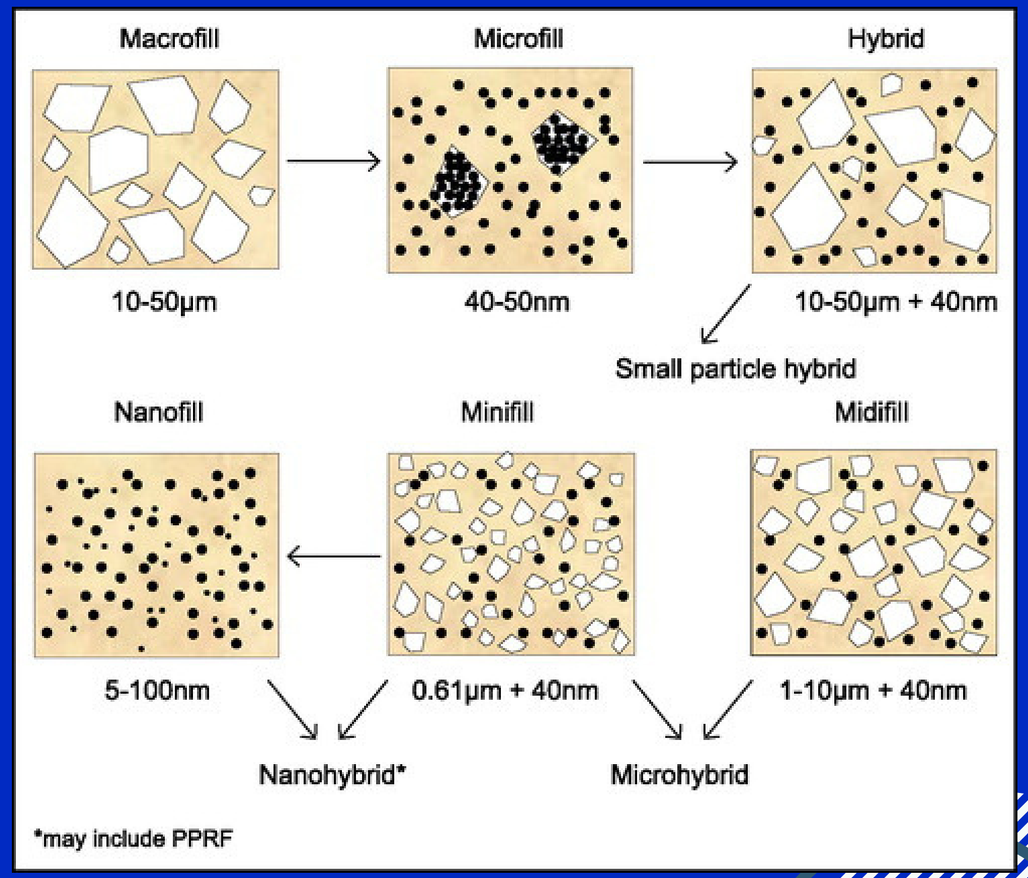
Classification

***Sturdevant*: Based on filler particle size**

- Megafill (0.5 - 2mm)
- Macrofill (10 -100micron)
- Midifill (1 - 10micron)
- Minifill (0.1 - 1micron)
- Microfill (0.01 - 0.1micron)
- Nanofill (0.05 - 0.01micron)

Skinners (10th ed):

- Traditional composites (Macrofilled) 8 - 12um
- Small particle-filled composite (1 - 1um)
- Microfilled composite (0.04 - 0.4um)
- Hybrid composite (0.6 - 1um)



Based on the method of curing:

- Chemical
- Light cure
  - Uv
  - Visible
- Dual cure

Based on consistency:

- Light body - flowable
- Medium body - Homogenous microfills,
- macro fills, midifills
- Heavy body - a packable hybrid, mini fills

- ***Based on the matrix:***
- Composites based on BisGMA
- Composites based on UDMA

- ***Based on their area of application:***
- Anterior
- posterior

- ***Based on inorganic loading:***
- Heavy filler material - 75%
- Lightly filler material - 66%

Mode of presentation

- Two paste system
- Single paste system

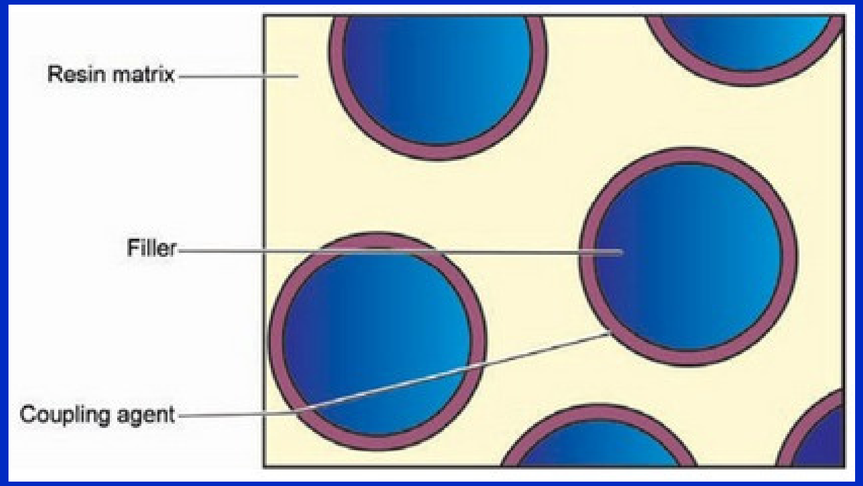
Composition

Major components:

- Resin matrix: BIS GMA, UDMA, TEGDMA, EGDMA, HEMA
- Coupling agents: Organosilanes
- Inorganic fillers: Quartz, Silica, Glasses

Other components:

- Inhibitors
- Activator-initiator system: Benzoyl peroxide + tertiary amine
- Optical modifiers: Camphoroquinone
- Color stabilizers
- Pigments



Composite Restoration

ARMAMENTARIUM:

- Teflon coated instruments
- Composite material
- Carvers - Hollenback, discoid cleoid, IP
- Curing light
- Polishing kit -
  - Finishing carbide burs,
  - Stone burs,
  - Soflex disks,
  - Finishing cups/discs/points (green - yellow-white)
- Retainer and matrix system: Tofflemire, Compound, Sectional matrix:
- Palodent contact matrix
- Wedges

Shade selection

- Color varies with translucency, the thickness of enamel and dentin, age of the patient, presence of any external/internal stains.
- Different color zones are present - the incisal third is lighter and translucent than a cervical third. The Middle third is a blend of two.
- Determine shade at the start
- Use either natural light/color corrected artificial light source
- Make quick comparisons with shade tabs (make selection rapidly to avoid eye fatigue.

ShadeVision® (X-Rite, Grandville, MI, USA)

ShadeEye NCC® (Shofu Dental, Menlo Park, CA, USA)

Criteria for Evaluation

Margin Deficiency	There is no marginal deficiency. There is no evidence of voids or open margins.
Margin Excess	There is no detectable marginal excess at the cavosurface margin either visually or with the tine of an explorer.
Gingival Overhang	The restoration exhibits no gingival overhang.
Surface Finish	The surface of the restoration is uniformly smooth and free of pits and voids.
Contiguous Tooth Structure	There is no evidence of unwarranted or unnecessary removal or recontouring of tooth structure contiguous to the restoration. (Enameloplasty)
Interproximal Contact	Interproximal contact is present; the contact is visually closed. It is appropriately shaped and positioned, and there is definite, but not excessive, resistance to dental floss when passed through the interproximal contact area.
Centric/ Excursive Contacts	All centric and excursive contacts on the restoration are consistent in size, shape, and intensity with such contacts on other teeth in that quadrant when checked with articulating ribbon or paper.
Anatomy/ Contour	The restoration reproduces the normal physiological proximal contours of the tooth, occlusal and marginal ridge anatomy.
Centric/ Excursive Contacts	Fractured Restoration, Restoration is debonded/ movable in the preparation

Good traits in Class II Composite Restoration

- Major grooves, pits, marginal ridges, cuspal planes of restoration are restored to meet anatomical and functional forms
- Marginal ridges are even with adjacent teeth/tooth
- No visible flash/excess
- Clinically acceptable contact
- Smooth surface, no voids

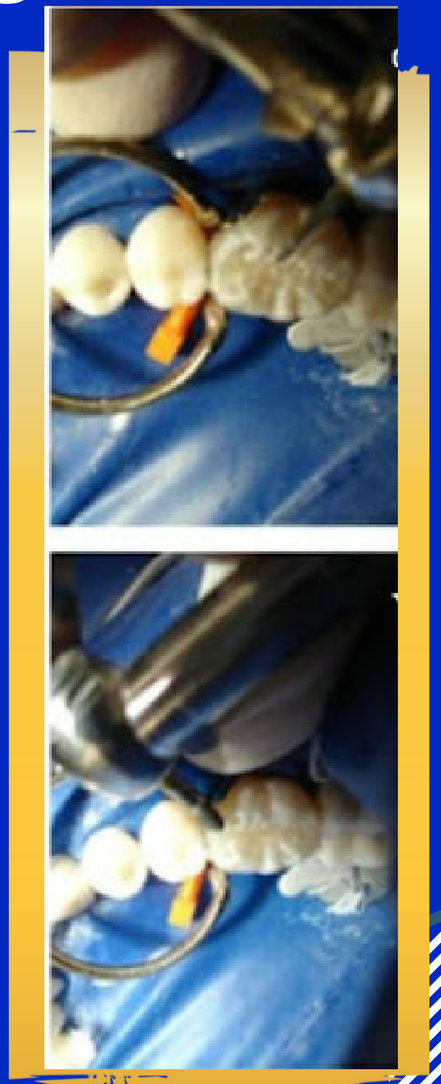
Class II composite restoration

- Apply matrix band and retainer: Pre-contoured Ultra-thin metal matrices - 0.001, 0.002 inches used
- Place a wedge interproximally
- Adhesive - cure for 10 sec

- Place small increments of composite with a vibratory motion - minimizing air bubbles.
  - Start in the proximal box - cure - instrument from composite to enamel
  - Add more composite layers in 1-1mm increments, and replicate occlusal anatomy cusps by cusps
- Before taking out the matrix band, final cure another few seconds in all directions.
- Take out the matrix band

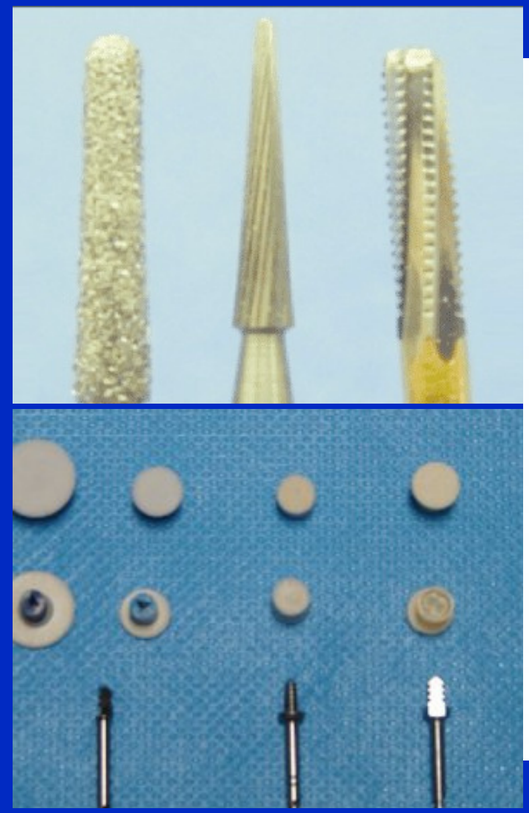
Pre-finishing and shaping

- Use #379F and #247 F burs the gross removal of composite, recreating anatomy, including accessory grooves and fissures
- When pre-finishing, always move from course grade burs to fine grade burs to achieve optimal polishability.
- Remove any remaining composite flash.

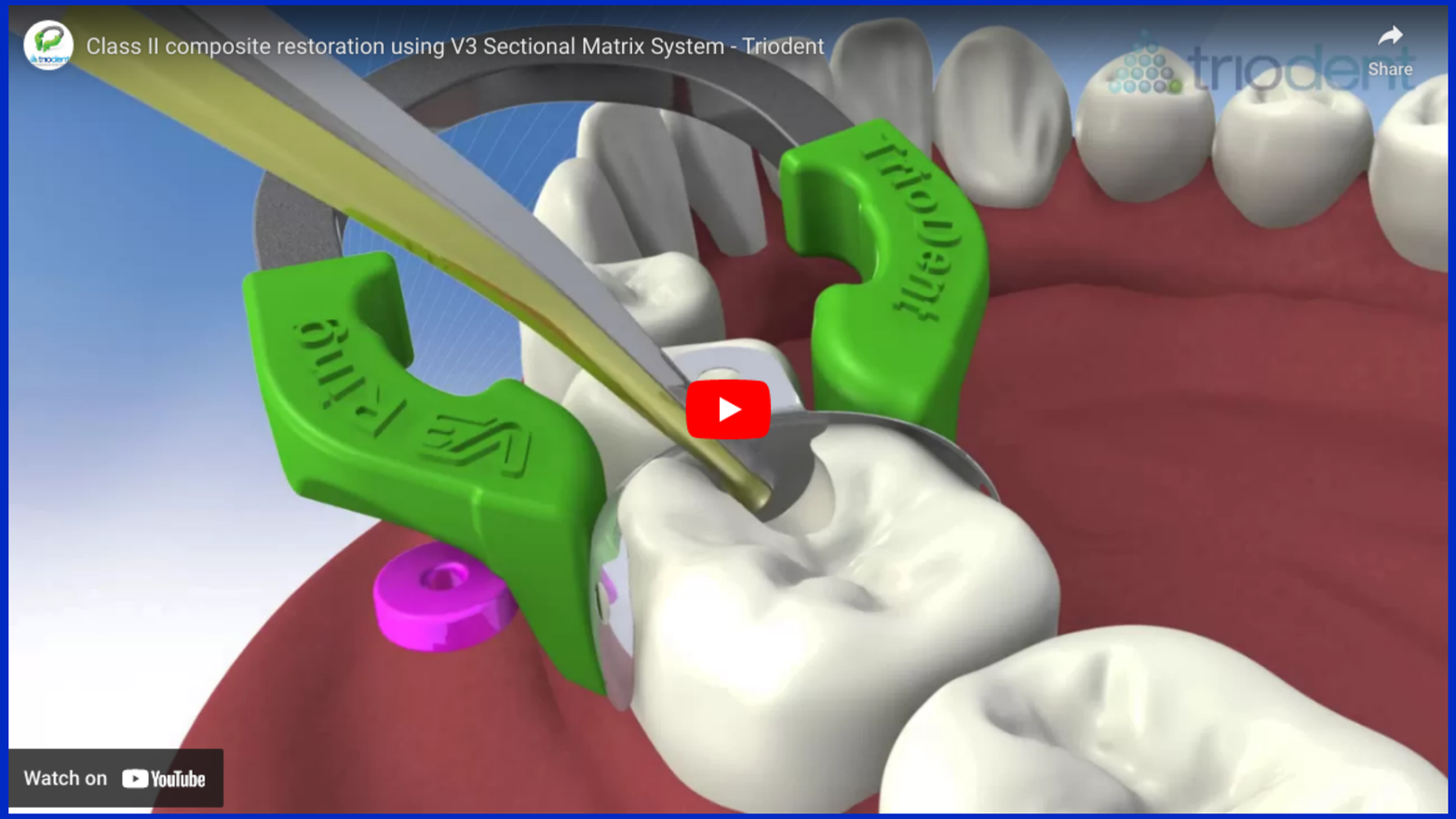


Finishing and Polishing

- Tungsten carbide finishing bur is used to contour the marginal ridge.
- Rugby ball-shaped fine diamond is used to contour the occlusal anatomy.
- A flexible, abrasive, impregnated soflex disc is used to polish and smooth the occlusal contours.



- Rinse and dry restoration and change to a super fine gradient disc.
- This should be done at a fast speed in a dry environment
- A jiffy brush can also be used for polishing
- Composite finishing strips can be used to polish interproximal areas
- Check interproximal areas with explorer and floss to
- ensure good polishing.
- Do not polish the contact itself to minimize the
- probability of losing adequate contact.



Click Here - To play this video

Click Here - To play this video

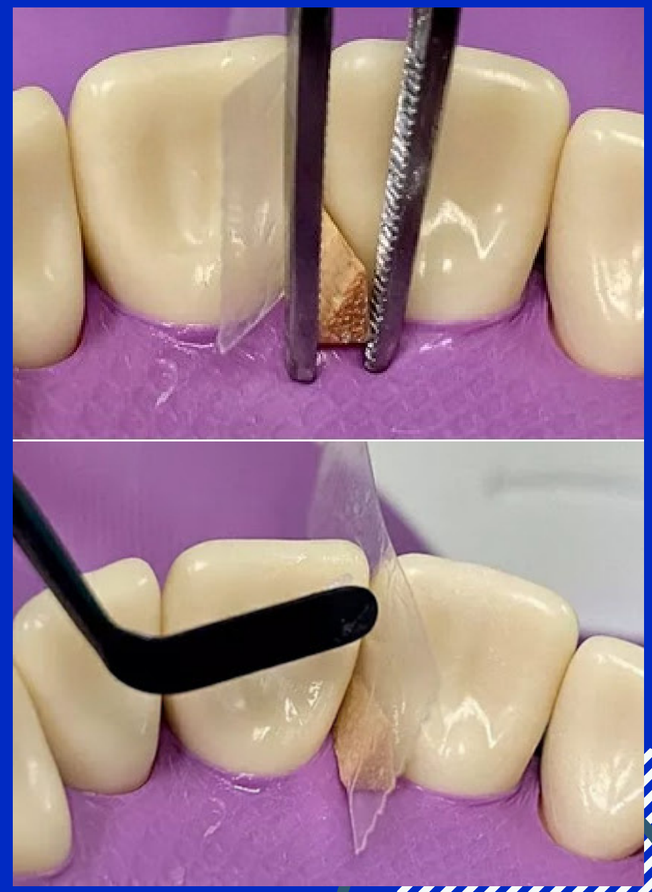
Stamp Technique

- It mimics the original tooth morphology by using the existing clinical condition before the necessary destruction of the tooth surface, reducing the time required for the removal of excess and polishing the restoration.

- Consists in taking an impression of the tooth structure before cavity preparation for getting a stamp through the negative imprint of the anatomical shape of the occlusal surface

Class III Composite Restoration

- Place a mylar strip interproximally (to facilitate strip placement, place an interproximal wedge before mylar strip placement)
- Instrument options: Plastic instrument, composite
- condenser, composite carrier, super plugger
- Place the composite in 1-1mm increments into the most
- facial portion of the preparation, beginning at the facial-axial line angle.
- Use the smallest composite plugger to pack the composite and ensure it is flush with the preparation walls: cure
- Incrementally fill, pack, and contour the preparation until the
- preparation is filled- Final cure

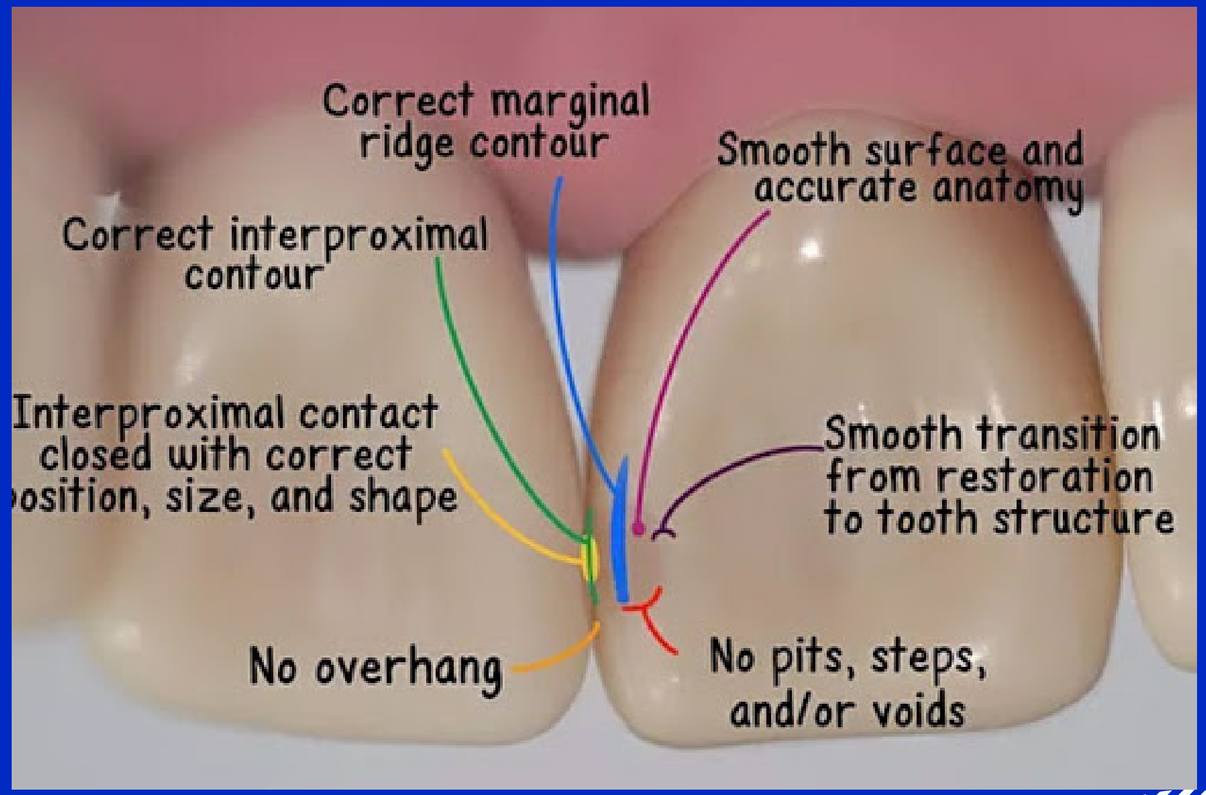


- Using the index finger, hold down on the facial portion of the mylar strip and wrap the lingual portion over the lingual contour of the tooth to create the proximal anatomy- cure
- Remove the wedge and mylar strip.
- Inspect the restoration using the explorer

- Bur options: dura white stone, fine and ultrafine diamond finishing burs, multi fluted carbide finishing burs, aluminum oxide polishing discs
- Perform fine finishing with rotary instruments or finishing strips
- Check the occlusion using articulating paper.
- Polish the restoration with rotary instruments (Slow speed)

Checklist

- Composite restoration must be flush to cavosurface margin with no pits, steps, and voids
- Smooth transition from restoration to tooth structure
- Correct marginal ridge height
- Closed interproximal contact
- Correct interproximal contour
- No overhang or underhang



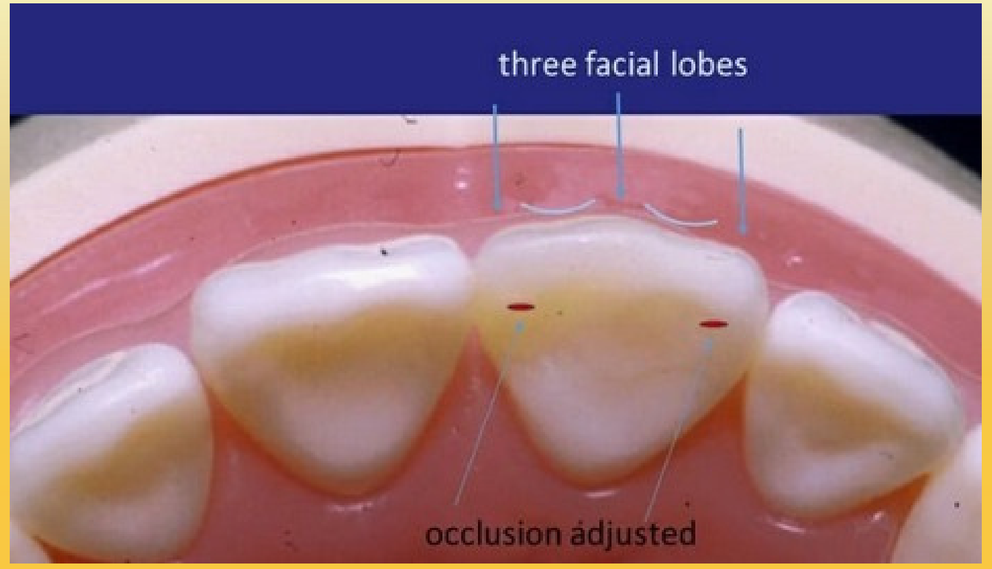
Class IV Restoration

- Thin layer adhesive light-cured (Facial and lingual) Wrap a one-piece mylar strip around the adjacent tooth.
- Apply a thin layer of composite resin against the lingual surfaces of the tooth and light-cured for 20 seconds
- Add the second layer of the resin over the first cured
- composite. The second layer creates dentinal
- opacity.
- The third increment is somewhat opaque and
- creates lobes and hints of mamelons.

Mylar’s “push/pull-through” technique

- Material is pushed toward the lingual using the flat instrument
- Final increment added
- Matrix is removed by gently pulling through lingually.
- Contour margin before curing- cure
- Finish with Diamond flame bur (low speed) / 30-fluted
- carbide finishing bur
- Interproximal polishing strips can also be used.
- Remember to separate teeth slightly before smoothing the
- contact area.

Final finished view



Class V Restoration

- Add the composite resin increments and light cure the material for 20 seconds.
- The polishing and final finish (finishing of the external walls)of the restoration are done.

Final view

Mnemonic

1.Margins
- Excess/Deficient

2.Morphology
- Height of Marginal Ridge (Proper, Excess, Deficient)
- Contour (Proper, Bulky, Flat)
- Incisal Embrasure (Proper, Insufficient)
- Anatomy (Proper, Lacking)

3.Occlusion

4.Contours

5.Contact
- Position (Proper, High, Low)
- Tightness (Proper, Light, Open)
- Area (Proper, Wide, Point)

6.Surface Finish
- Smooth/ Rough
- Voids/ Pits

(MM)O(CC)S

REFERENCES

- Roberson. T.(2006). Sturdevant’s Art and Science of operative dentistry (5th edn)
- Phillips’ Science of dental materials
- Marzouk - Operative dentistry- modern theory and practice
- Craig’s dental materials
- Principles and practice of operative dentistry- Charbeneau
- Occlusal stamp technique for direct resin composite restoration: A clinical case report - Jose Guilherme Ferror Pompeu

Thank You

CAAPID
Simplified
Demystifying Dental Admission