In The Name Of God

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QUMS

Restorative Dentistry for the Primary Dentition

References : pinkham , chapter 21

INSTRUMENTATION

- High speed Handpiece(100,000 to 300,000 rpm)
- Low speed handpiece(500 to 15,000 rpm)
- hand instrumentation
- air abrasion

INSTRUMENTATION

- Handpiece
  - Water or air Coolant
  - Intermittent cutting at intervals of a few seconds
  - light brushing strokes
  - light pressure

INSTRUMENTATION

- hand instrumentation
  - final caries removal
  - planing of enamel walls

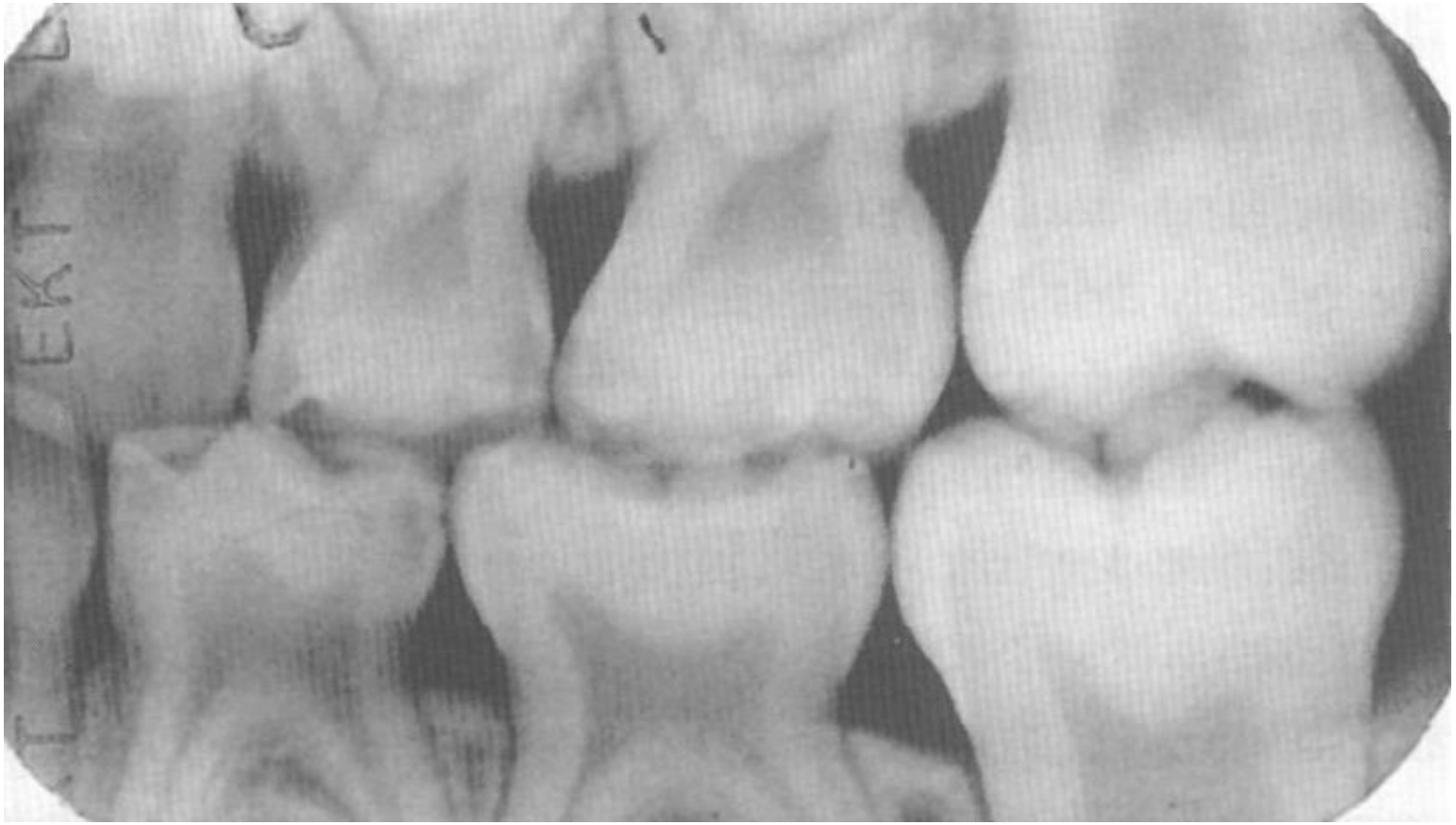
INSTRUMENTATION

- air abrasion
  - stream of purified aluminum oxide particles(27 to 50 μm)
  - Advantages:
    - absence of vibration and noise
    - Not required to local anesthesia
  - Disadvantages
    - Cost
    - Dust
    - does not totally eliminate the need for conventional handpieces

Anatomic Differences Between Primary and Permanent Teeth

1. thinner enamel and dentin thickness
2. The pulps of primary teeth are larger in relation to crown size.
3. The pulp horns are closer to the outer surface of the tooth. The mesiobuccal pulp horn is the most prominent.
4. enamel rods of the gingival third of the crown extend in an occlusal direction from the DEJ
5. greater constriction of the crown and have a more prominent cervical contour
6. broad, flat proximal contact areas.
7. whiter than their permanent successors.
8. relatively narrow occlusal table

Anatomic Differences Between Primary and Permanent Teeth



RESTORATION OF PRIMARY MOLARS

- fissured occlusal surfaces
- broad, flat interproximal contact
- SSCs, amalgam
- adhesive materials : resin-based composites,resin-modified glass ionomers, compomers

Class I Amalgam Restorations

- Using a no. 330 bur in the high-speed turbine handpiece, penetrate into the tooth parallel to its long axis in the central pit region and extend into all susceptible fissures and pits to a depth 0.5 mm in dentin.
- Caries removal
- refine the final outline form
- Place amalgam into the preparation
- Condonsation
- Carving
- Burnishing
- Remove the rubber dam and check the occlusion.

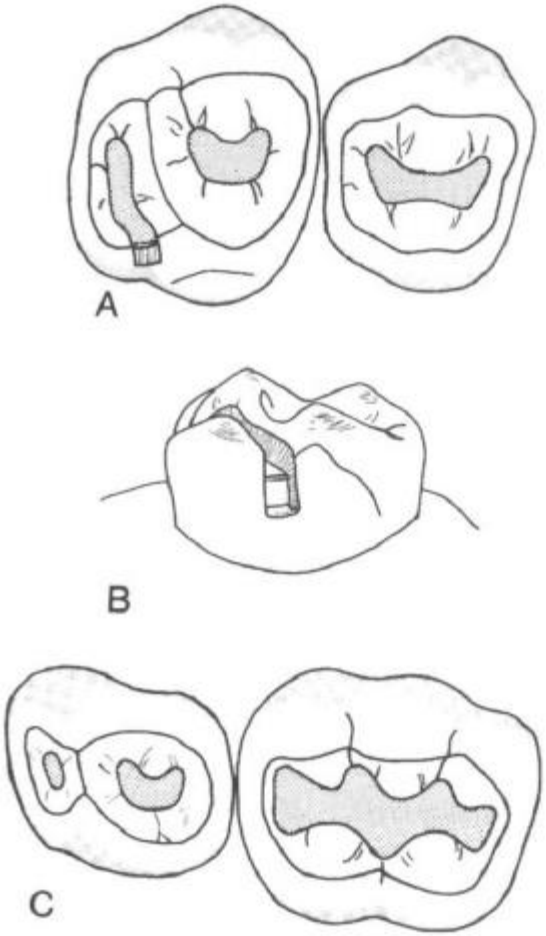
Class I Amalgam Restorations

- Pulpal floor depth : 0.5 mm into dentin (approximately 1.5 mm from the enamel surface)
- out of stress-bearing areas, no bevel
- internal angles should be rounded
- mesial and distal walls should flare
- Oblique ridges should not be crossed
- Buccal pits : teardrop or ovoid-shaped

Class I Amalgam Restorations

- When a dovetail is placed in the second primary molars:
  - buccolingual width greater than the isthmus width
  - isthmus should be one third of the intercuspal width

Class I Amalgam Restorations



Common Errors with Class I Amalgam Restorations

- preparing the cavity too deep
- undercutting the marginal ridges
- Carving the anatomy of the amalgam too deep
- Not removing amalgam flash from cavosurface margins
- Undercarving
- not including all susceptible fissures

Class II Amalgam Restorations

- Using a no. 330 bur in the high-speed turbine handpiece prepare the occlusal outline form at ideal depth

- prepare the proximal box:
  - Begin at the marginal ridge in a pendulum motion , gingival direction at the dentin-enamel junction
  - Contact brake
  - Caries removal
  - Round the axiopulpal line angle

- Remove any unsupported enamel
- place a matrix band and wedge

Class II Amalgam Restorations

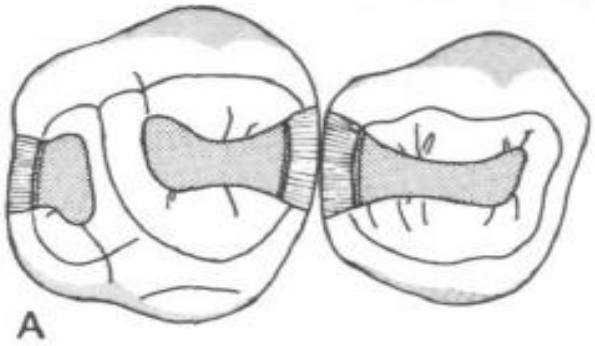
- class I preparation

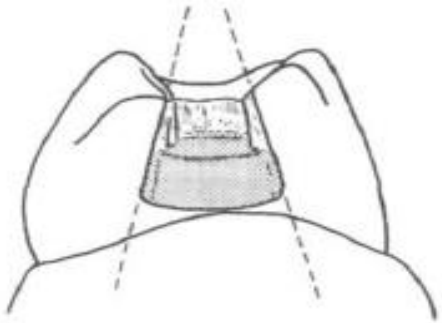
- Proximal box :
  - Broader at cervical
  - buccal, lingual, and gingival walls should all break contact with the adjacent tooth
  - Buccal and lingual walls should create a 90-degree angle with the enamel
  - axial wall of the proximal box should be 0.5 mm into dentin
  - axiopulpal line angle beveled or rounded
  - mesiodistal width of the gingival seat should be 1 mm

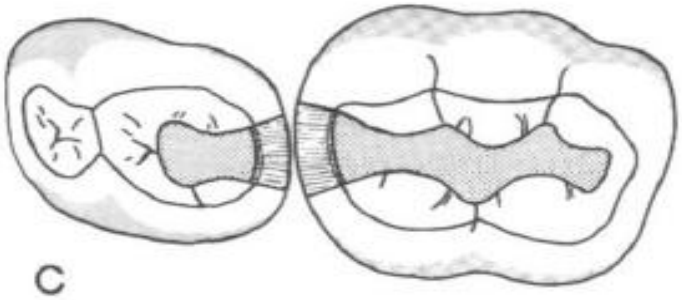
Class II Amalgam Restorations

- Place amalgam into the preparation beginning in the proximal box
- Condensation
- Carving
- remove the wedge and the matrix band
- Remove excess amalgam
- Gently floss the interproximal contact
- Burnishing
- Remove the rubber dam and check the occlusion.

Class II Amalgam Restorations







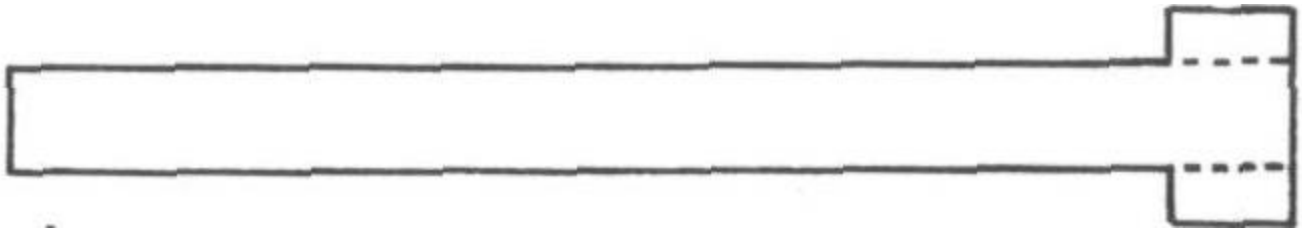
matrix

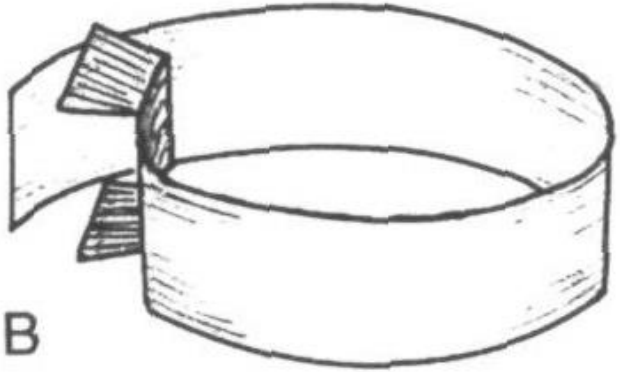
- T band
- Sectional matrix
- AutoMatrix
- Spot-welded matrix
- Tofflemire matrix

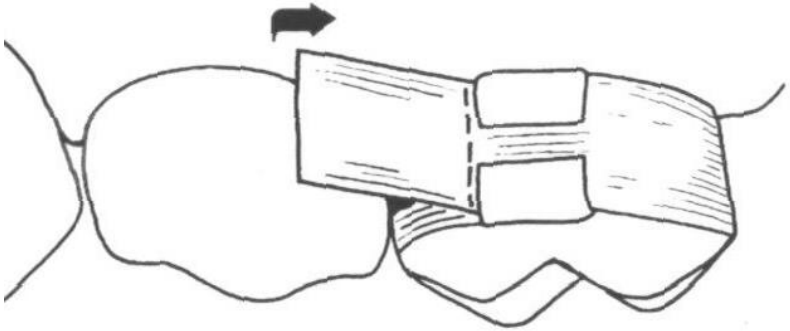
matrix

- T band
  - allows for multiple matrices
  - different sizes, contours , materials
  - straight, narrow, brass
- Sectional matrix
  - allows for multiple matrix placement
  - easy to use
  - Not circumferential
  - small class II preparations
  - not recommended for proximal preparations that extend beyond the line angles

T band







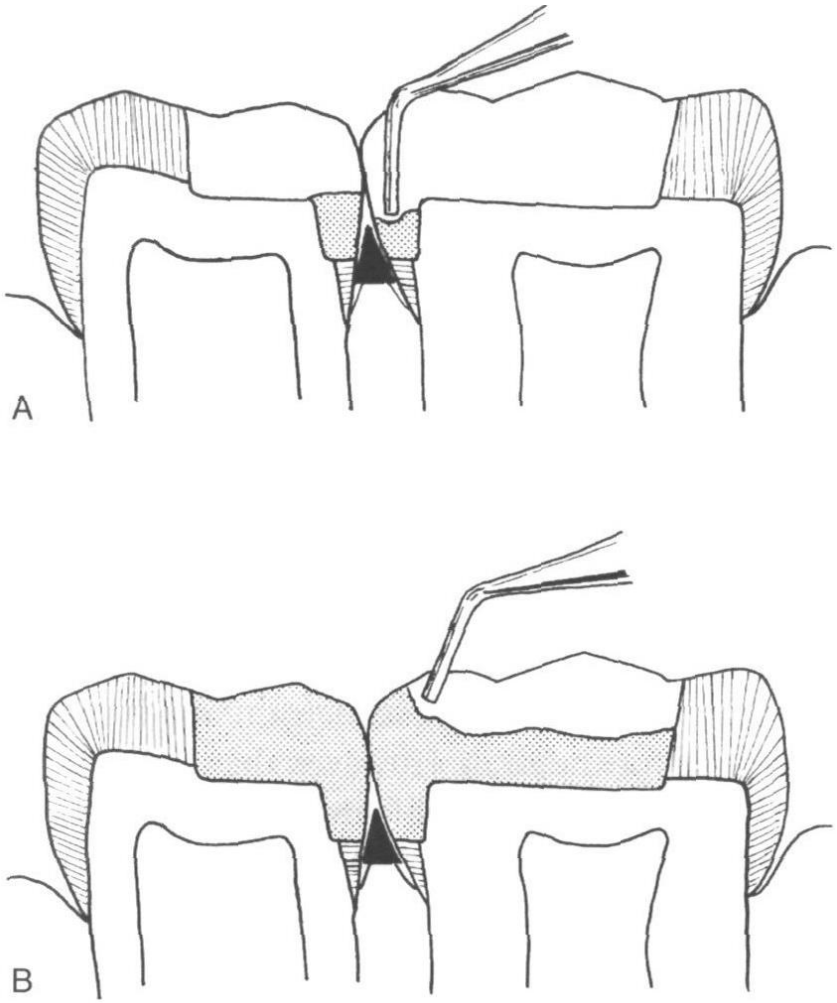
matrix

- AutoMatrix:
  - allows for multiple matrix
  - easy to use
  - Requires special tightening and removal tools
  - Preformed loop of stainless steel
- Spot-welded matrix:
  - allows for multiple matrix placement
  - spot welder is required at chairside
- Tofflemire matrix:
  - used infrequently
  - difficult to place as multiple matrices

Back-to-Back Class II Amalgam Restorations

- T bands, sectional, or spot-welded matrices
- Condensation of the amalgam should be done in small increments, alternately in each preparation.
- Condensation pressure toward the matrix
- Carve the marginal ridges to an equal height

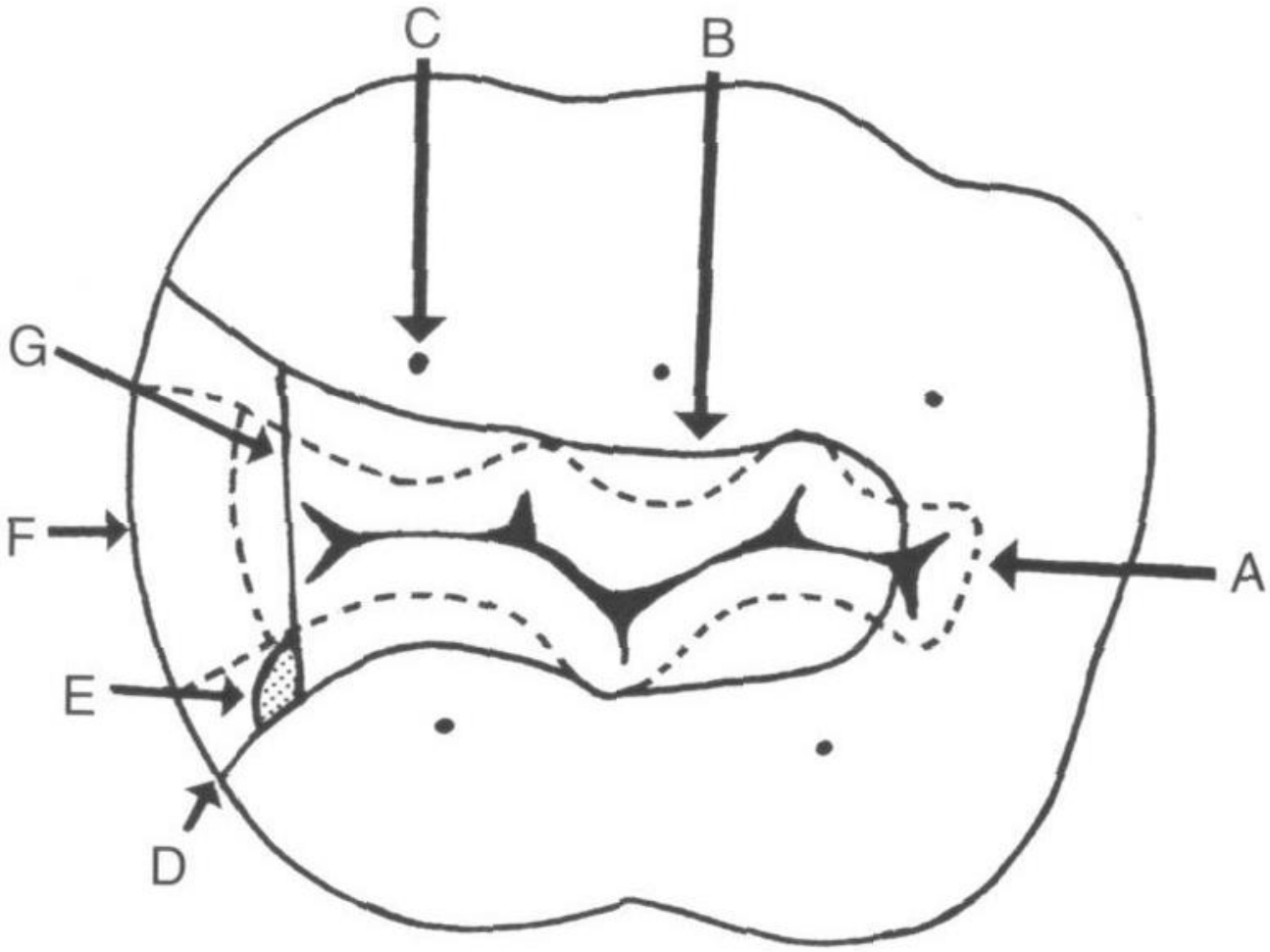
Back-to-Back Class II Amalgam Restorations



Problems with Amalgam Restorations

- Fracture of the isthmus:
  - being left high in occlusion
  - insufficient bulk of amalgam
    - preparation too shallow
    - the amalgam overcarved
- Marginal failure in the proximal box:
  - excessive flare of the cavosurface margin
- Failure to remove all caries or to extend preparations into caries-susceptible fissures

Problems with Amalgam Restorations



Finishing of Amalgam Restorations

- polishing of amalgams has been advocated to:
  - eliminate surface scratches
  - remove any remaining amalgam flash
  - refine the anatomy and occlusion

- no contraindications to polishing amalgam
- Polishing should be delayed for at least 24 hours following amalgam placement
- Well polished amalgam restoration should allow the explorer to pass easily from enamel to amalgam and back again

Finishing of Amalgam Restorations

- gross contouring of the amalgam or flash removal with a tapered green stone
- smooth and shine the surface: multiple fluted amalgam finishing burs
- final polish : rotary bristle brush with a pumice, tin oxide
- Proximally : small sandpaper disks to polish the enamel-amalgam margins

Adhesive Materials in Primary Molars

- greatest problem: occlusal wear
- Advantages :
  - Aesthetics
  - elimination of mercury
  - low thermal conductivity
  - more conservation of tooth structure
  - bonding of the restorative material to the tooth
- Disadvantages :
  - Exacting technique
  - increased operator time
  - potential marginal Leakage
  - postoperative sensitivity
  - tendency to open or lose contacts

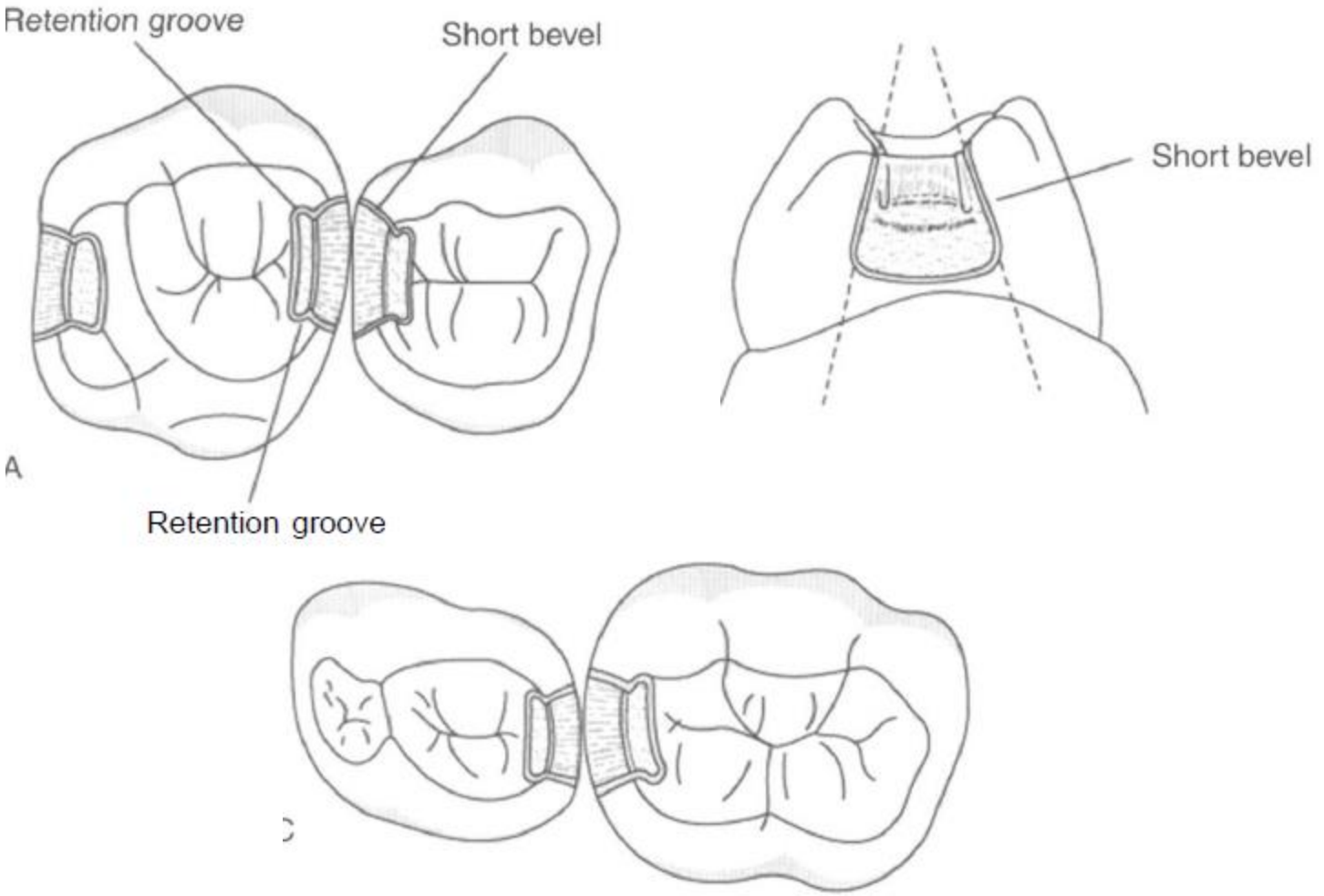
Conservative Adhesive Restorations

- PRR
- CAR 1
- CAR2
- CAR3

Class II of Primary Molars with Adhesive Materials

- Preparation restricted to the region of the caries
- occlusal extensions little or no
- Extending in "selfcleansing“ areas not necessary
- short bevel

ClassII of Primary Molars with Adhesive Materials



Stainless steel crowns

- Full coverage, metallic, definitive restoration
- Durable and cost effective
- Available as:

Pretrimmed (unitek)

Precontoured and festooned

Indications for use of SSC

- Restoration of primary or young permanent teeth with extensive caries lesion
- Restoration of hypoplasia primary or permanent teeth
- Restoration of primary teeth flowing pulpotomy or pulpectomy procedures
- Restoration of teeth with heredity anomalies
- Restorations is disabled individuals or others in whom oral hygiene is extremely poor
- As an abutment for space maintainers or prosthetic appliances
- Strong considerations should be given to the use of SSC in children who require general anesthesia for dental treatment

Steps for preparation and placement of stainless steel crowns

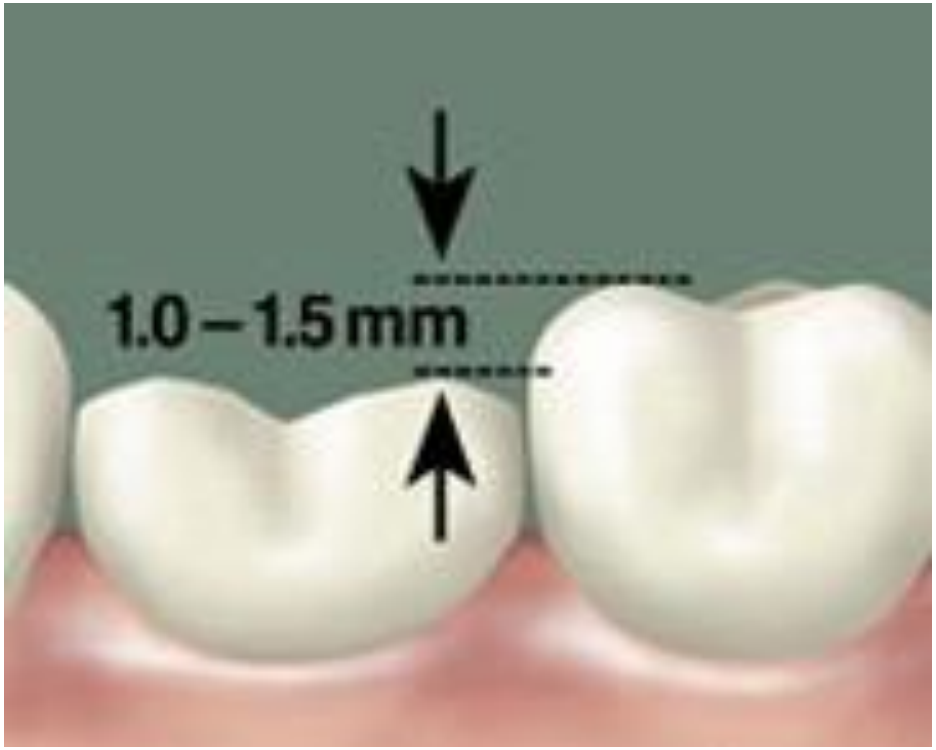
- Evaluate pre-operative occlusion
- Administer appropriate local anesthesia
- Place rubber dam (clamp adjacent tooth)
- Removal of caries
- Crown preparation
- Selection and trial placement of SSC
- Continuing and crimping (if necessary)
- Evaluate post-operative occlusion
- Cementation

Crown preparation

- Occlusal reduction
- Inter-proximal Reduction
- Buccal and Lingual reduction (limited to occlusal 1/3)

Occlusal reduction

- Place depth cuts and uniformly reduce occlusal surface by 1.5 mm



Proximal Reduction

- Break proximal contacts at appropriate depth in single sweeping motion
- Vertical proximal walls with slight convergence in an occlusal direction
- Feather-edge finish line
- Common error-ledge formation

Proximal Reduction

Buccal and Lingual reduction

- Limited to occlusal 1/3 as a 45° bevel
- Round off all line angles
- Occasionally, an exaggerated mesiobuccal or cervical bulge may warrant more buccal and Lingual reduction

Crown selection and Try-in

- Select smallest crown that restores preexisting proximal contacts
- Occlusal dimensions of SSC should be same as pre-op tooth
- Place or seat crown from lingual to buccal
- Push crown over the buccal bulge for a snap fit
- Check margins for close cervical adaptation extending 1mm subgingivally
- Blanching effect
- Remove dam and check occlusion

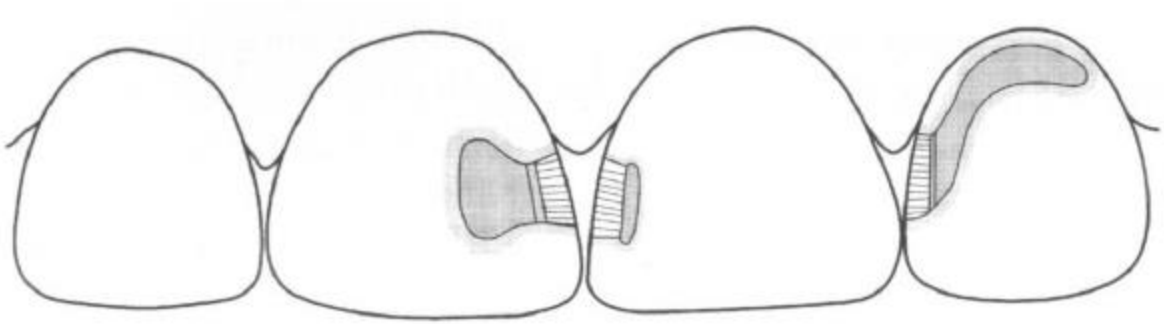
Restoration of primary incisors and canines

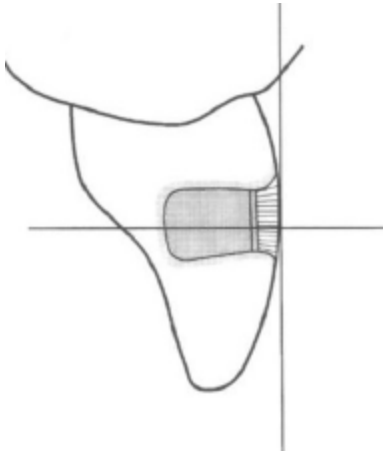
- Indication :
  - caries
  - Trauma
  - Developmental defects
- class III & V restorations:
  - Adhesive materials(resin-based composites or resin ionomer products)
- Class IV restorations:
  - Full coverage with a crown

Class III Adhesive Restorations on primary incisors

- very challenging to do well
  - Caries often extend subgingivally
  - large size of the pulps
  - additional mechanical retention required
  - preparing the entire facial surface by 0.5 mm and veneering the surface

Class III Adhesive Restorations on primary incisors

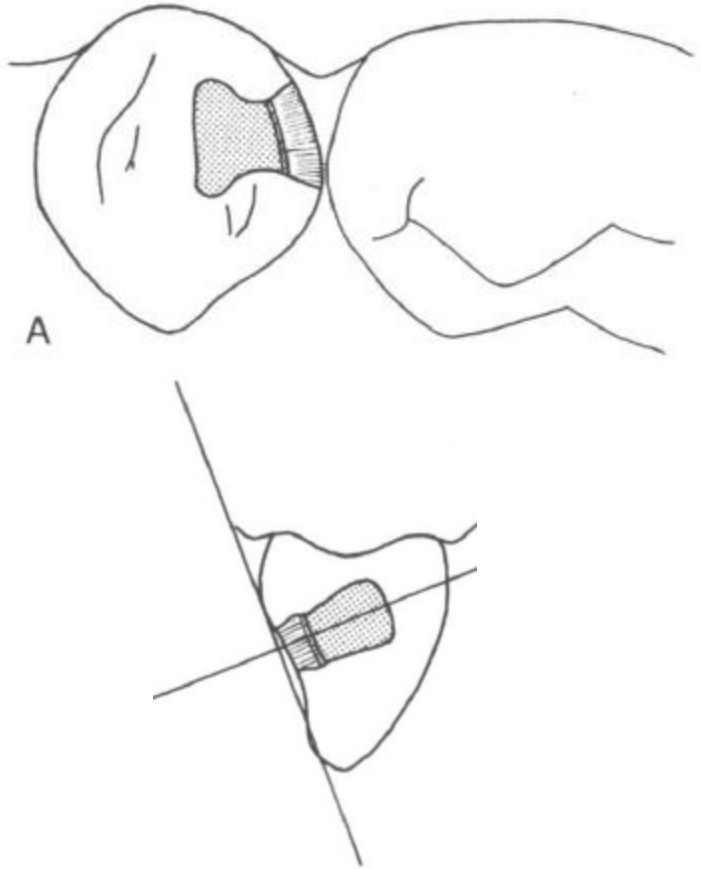




Class III Adhesive Restorations on primary canines

- Is different from that for incisors:
  - Proximal box direction
  - Either amalgam or adhesive materials may be used
- dovetail may be placed on the facial surface
- except when amalgam is chosen for a maxillary canine

Class III Adhesive Restorations on primary canines



Class III Adhesive Restorations

- Create access, and remove caries with a no.330 bur or a no. 2 round bur
- axial wall placed 0.5 mm into dentin
- Contact break
- dovetail or lock placed on the labial or lingual surface
  - not extend more than halfway across the labial
  - kept in the middle horizontal third

Class III Adhesive Restorations

- short bevel (0.5 mm)
- Clean & dry
- Place a plastic or sectional metal matrix
- Etch for 15 to 20 seconds
  - Retention
  - Marginal integrity
  - reduced marginal leakage
- rinse and dry

Class III Adhesive Restorations

- dentin-bonding agent
- place the composite
- Finishing and polishing
- rubber dam Removing

Finishing and polishing

- Gross finishing or contouring: fine-grit diamonds or with carbide finishing burs
- finishing facial & interproximal: flame carbide finishing bur
- gingival flash removing : curved blade scalpel
- lingual surface: round or pear-shaped carbide finishing bur
- final polishing: composite polishing gloss
- Final interproximal polishing: sandpaper strips

Class V Restorations for Incisors and Canines

- adhesive materials or amalgam
- caries removal with a no. 330 bur until dentin is reached (approximately 1 mm from the outer enamel surface)
- pulpal wall convex parallel to the outer enamel surface
- lateral walls slightly flared
- final external outline determined by :extent of caries
- small undercuts in the gingivoaxial and incisoaxial line angles
- short bevel

Full Coronal Coverage of Incisors

- large interproximal lesions
- Incisors that have received pulp therapy
- Incisors that have been fractured and have lost an appreciable amount of tooth structure
- multiple hypoplastic defects
- Discolored incisors that are aesthetically unpleasing
- small interproximal lesions that also demonstrate large areas of cervical decalcification

Full Coronal Coverage of Incisors

- Methods :
  - adhesive resin based composite crowns
  - SSCs
  - veneered or open-face SSCs
  - preveneered SSCs

resin based composite crowns

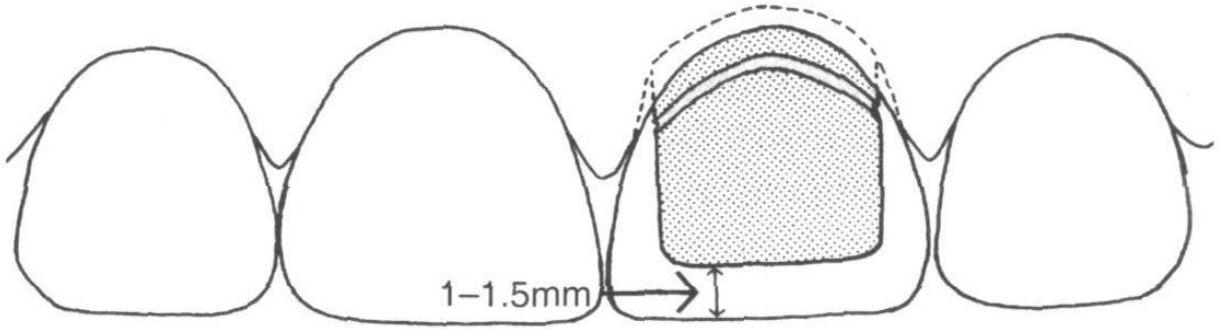
- Strip crown
- most aesthetic
- frequently placed crown

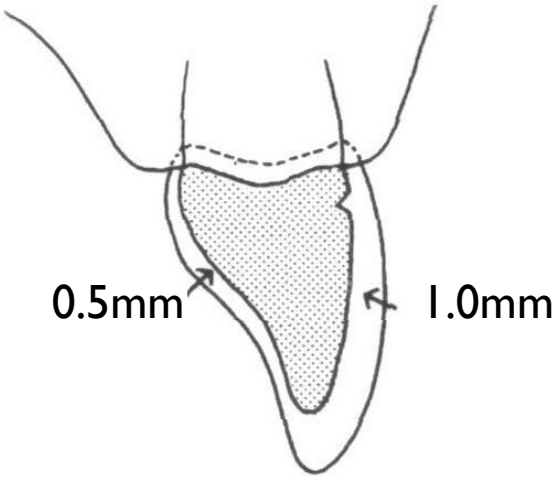
resin based composite crowns

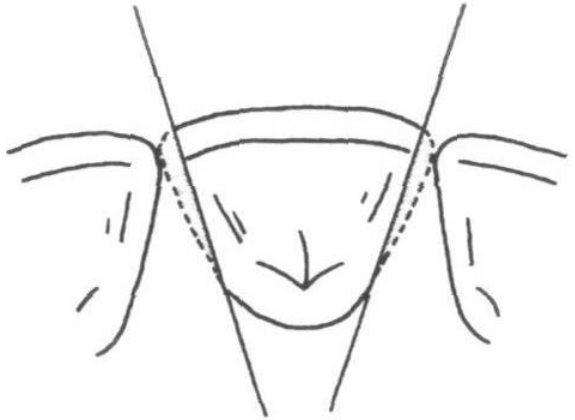
- Shade selection
- Crown selection
- Decay removal
- Reduce incisal edge 1.5 mm
- Reduce interproximal 0.5 -1.0 m
- gingival margin be feather edge
- Facial reduction at least 1.0 mm
- Lingual reduction at least 0.5 mm

resin based composite crowns

resin based composite crowns







resin based composite crowns

- Undercut placement in the gingival one third
- Crown trimming
  - 1 mm below the gingival crest
  - Comparable height to adjacent teeth
  - lateral incisors usually 0.5 -1.0 mm shorter than central incisors
- punch a small hole
- Etch , bonding apply
- Fill the 2/3 of crown with composite

resin based composite crowns

- Crown seating
- Remove excess composite
- Polymerize the material
- Crown removal
- Rubber dam removal
- Occlusion evaluation
- Finishing

SSC

- very durable restoration
- aesthetically unpleasing
- often used on severely decayed canines and mandibular incisors
- Preparation is identical to resin crown without facial undercut
- Ssc selection
- Squeezing crown slightly mesiodistally with a pair of Howe no. 110

SSC

- Fit be sung
- orthodontic band pusher or tongue blade may be used to aid in seating
- do not generally require much trimming
- Contouring and crimping are necessary
- Check final marginal adaptation
- Polishing &cementation

Openface crowns

- retention is superior to that of adhesive resin crowns
- aesthetic are compromised

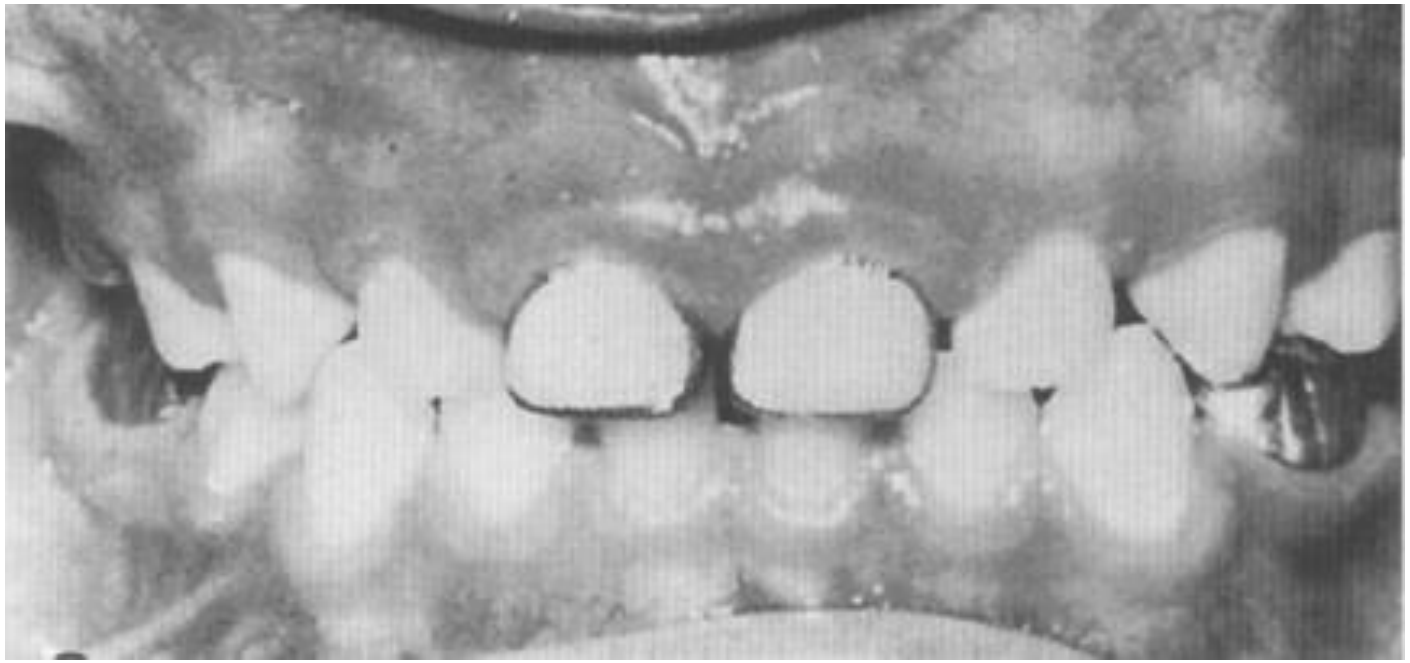
Veneered or open-face SSCs

- cement must be set
- Cutting labial window
  - short of the incisal edge
  - Gingivally to the height of the gingival crest
  - mesiodistally, to the line angles
- remove the cement to a depth of 1 mm
- Undercuts must be placed at each margin

Veneered or open-face SSCs

- Smoothing cut margins with a fine green or white finishing stone
- mask any differences in color with GI liner
- Etch , bonding , composite
- finish with abrasive disks from resin to metal at the margins

Veneered or open-face SSCs



preveneered SSCs

- Aesthetically pleasing
- short operating time
- Durability
- less moisture sensitive
- Preparation is similar to the nonveneered crown
- more tooth reduction especially on the B & L
- "snap" fit not be achieved
- snug, sleeve-like fit recommended

preveneered SSCs

- Limitations
  - crimping limited to the lingual
  - Cost

- most common problem: chip off part of the veneer
  - cutting a small window
  - replacing the crown

preveneered SSCs

TECHNIQUE	AESTHETICS	DURABILITY	TIME FOR PLACEMENT	SELECTION CRITERIA
Resin (strip) crowns*	Very good initially; may discolor over time	Retention dependent on amount of tooth structure present and quality of acid etch. Can be dislodged fairly easily if traumatized	Time required for optimum isolation, etching, placement, finishing	When aesthetics are a great concern. Adequate tooth structure remains for etching/bonding. Child is not highly prone to trauma. Gingival hemorrhage is controllable.
Steel crowns	Poor	Very good; a well-crimped, cemented crown is very retentive and wears well.	Fastest crown to place	Severely decayed teeth. Aesthetics of little concern. Unable to adequately control gingival hemorrhage. Need to place a restoration quickly because of inadequate cooperation or time.
Open-face steel crowns	Good; however, usually some metal shows.	Good; like steel crowns, are very retentive; however, facings may be dislodged.	Takes longest to place because of two-step procedure: - Crown placement - Composite placement	Severely decayed teeth. Durability needed: active, accident-prone child or severe bruxism evident.
Prefabricated veneered steel crowns	Good	Good; however, facings occasionally break.	Not as fast as the plain steel crown; must make tooth fit the crown.	Aesthetics are a concern. Hemorrhage difficult to control.

Thanks