Stainless Steel Crowns
Objectives

• Indications for use of stainless steel crowns
• Technique used in preparing and placing a stainless steel crown restoration on a primary molar.
Indications for SSC

• Restoration of primary or young permanent teeth with extensive carious lesions.
• Restoration of hypoplastic teeth.
• Restoration of molars following pulpotomy or pulpectomy procedures.
• Restoration of teeth with heridictary anomalies like amelogenesis and dentinogenesis imperfecta.
Indications for SSC

• Restoration in individuals with disabilities in whom oral hygiene is poor and risk of restorative failure is high.
• As an abutment for space maintainers or prosthetic appliances.
• As restoration for children with high risk for general anaesthesia for restorative procedures.
Preparation & placement of SSC

• Evaluate the pre-operative occlusion
• Administer local anaesthesia for tooth and surrounding soft tissue.
• Place rubber dam.
• Remove all carious lesions and restore appropriately.
Preparation & placement of SSC – 1

- Reduce occlusal surface by 1mm – 1.5mm using no 169L taper fissure bur.
- Reduce all line angles and sharp corners of the preparations.
Preparation & placement of SSC - 2

• Reduce proximal surface using a taper fissure bur.
• Break contact with adjacent teeth gingivally and buccolingually.
• Maintain vertical walls of the proximal surfaces with slight convergence in an occlusal direction.
• Gingival proximal margin should be feather-edge finish.
• Avoid damaging adjacent tooth.
Preparation & placement of SSC - 3

• Select a crown. This starts as a trial and error process. Aim is to select the smallest crown that can be seated on the tooth and can establish pre-existing proximal contacts.
• Try selected crown on the prepared tooth by seating the lingual face first and applying pressure in the buccal direction so that the crown can slide over the buccal surface into the gingival sulcus.
• Friction must be felt as the tooth is pushed to seat on in the gingival sulcus over the buccal surface.
• After seating the crown, establish a preliminary occlusal relationship by comparing adjacent marginal ridge heights. If height is too high (i) occlusal reduction may have been inadequate (ii) gingival proximal ledge may exist (iii) contact with adjacent tooth may not have been broken.
An extensive area of gingival blanching around the crown indicates that the crown is too long and may need trimming. A properly trimmed crown would extend 1mm into the gingival sulcus.
Before trimming, place the crown on the prepared tooth and mark the level of the gingival crest with a sharp instrument. Trim the crown with a crown scissors 1mm below the mark and ensure it follows the contour of the gingival tissue.
Contour and crimp the crown to form a tightly fitting crown. This involves bending the gingival one third of the crown’s margin inward to restore the anatomical shape of the natural crown and to reduce the marginal circumference of the crown, ensuring good fit. This is accomplished using a no 114 ball and socket plier.
Final close adaptation of the crown is achieved by crimping the cervical margin 1mm circumferentially using the no 137 pliers or no 800-417 crimping plier.
Preparation & placement of SSC - 10

- Tight fit aids in (i) mechanical retention of the crown (ii) protection of the cement from exposure to oral fluids (iii) maintenance of gingival health.
- A properly contoured and crimped SSC would cause firm resistance when trying to remove the crown once seated.
Once crown is seated, examine the gingival margins with an explorer for areas of poor fit. Observe the gingival tissue for blanching and examine the proximal contacts. Use the ball and socket plier to enhance proximal contact if needed.
Preparation & placement of SSC - 12

• To remove the crown, use a scaler or amalgam carver to engage the gingival margin and dislodge the crown. Keep a thumb or finger over the crown during removal so that crown movement is controlled.
Preparation & placement of SSC - 13

• Remove rubber dam. Be careful to prevent crown dropping in the oropharynx. Use gauze to protect oropharynx.
• Replace the crown to check for occlusion. Check the occlusion bilaterally with the patient in centric occlusion. Check for movement of the crown in the occlusogingival direction with bite pressure and check for excessive gingival blanching.
Finally, remove the crown again and smoothen the crown margin before cementation. Use a heatless stone to smoothen the margins placed at a 45 degree angle to the edge of the crown.
Preparation & placement of SSC - 16

- Next polish the crown to remove surface scratches using a rubber wheel. Wire brush can be used to polish this to a high shine.
Preparation & placement of SSC - 17

• Rinse and dry the crown inside and outside and prepare to cement.

• Use GIC, Zinc phosphate, ZnOE or self curing resin ionomer cement to fill two thirds of the crown with cement ensuring all surfaces are covered.

• Dry the tooth with compressed air and seat the crown completely allowing cement to flush out from all margins.
Preparation & placement of SSC - 18

• Use the Howe No 110 pliers to obtain optimum alignment if necessary.
• Instruct the patient to bite on a tongue blade to ensure complete seating.
• Before the cement sets, have the patient close into centric occlusion and confirm that the occlusion is not altered.
Preparation & placement of SSC - 19

• Remove excess cement from the gingival sulcus using a scaler or explorer tip. Clean the interproximal areas by tying a knot in a piece of dental floss and drawing the floss through the interproximal region.

• Rinse the oral cavity well and reexamine the occlusion and soft tissue before dismissing the patient.
Principles for optimal adaptation

• While SSC may look good in the mouth when finished, radiographically, many margins are poorly adapted to proximal tooth surfaces, may be too long and proximal contours are not well reproduced.
Principles for optimal adaptation

• These deficiencies often have little adverse effect on supporting tissues.
• Avoid deficiencies by paying attention to crown length and shape of crown’s gingival margin.
Crown length

- Allow crown to fit just into the gingival sulcus and engaging the natural undercuts. This is just above the gingival crest.
- Crowns that extend well beyond a tooth’s height of contour are very difficult to adapt closely to the tooth surface.
Shape of crown’s gingival margin

• The shape of crown’s gingival margin differ between the first and the second primary molar and from the buccal to lingual to proximal surfaces.

• The margins of the trimmed crown should approximate to the shape of the gingival crest around the tooth.
The buccal gingival contour of the second primary molar is described as a smile.

The buccal gingival contour of the first primary molar is like a stretched out ‘S’ lying on its side.

The gingival contour of lingual surfaces is a smile.

The proximal gingival contour is a frown.
Placing adjacent crowns

- Prepare occlusal reduction of one tooth completely before beginning the occlusal reduction of the other tooth. Otherwise you often have under-reduction.
- Ensure the broken contact between the two teeth has approximately 1.5mm space at the gingival level.
- Prepare both crown for cementation simultaneously starting with the distal tooth.
Oversized crowns

• Try the crown on the tooth
• Use a pair of scissors to cut the crown from the gingival to occlusal surface either buccally or lingually.
• Pinch the crown together in an attempt to reduce the size and try on the tooth again ensuring appropriate gingival contour.
• Remove and spot weld the overlap edges together.
Undersized crowns

• Check the crown on the tooth
• Cut a ‘V’ in the crown on the buccal or lingual side and try the crown on the tooth.
• Use a strip of orthodontic band material to spot weld over the V cut in the crown while the crown is in the mouth and adapt the crown to the tooth.
• Spot weld, solder, finish and place the crown.
Advantages of SSC

- Superior to large multi-surface amalgam restoration
- Longer clinical lifespan than two- or three- surface amalgam restorations.
- Durable material.
- Inexpensive material.
- Easy and quick to place.
Types of SSC

- **Pre-trimmed crowns**: these crowns are straight, non-contoured sides but are festooned to follow a line parallel to the gingival crest. They require contouring and some trimming.

- **Pre-contoured crowns**: these crowns are festooned and also pre-contoured. Minimal contouring and trimming may be necessary. Trimming may result in the loss of contour and crown may fit loosely.
Pre-veneered SSC: available but not widely used. They have resin-based composite facing on the occlusal and buccal surfaces to improve aesthetics. They are more expensive and require more tooth reduction. They also allow for minimal crimping for crown adaptation.
Causes of crown failure

- Poor removal of caries or pulp therapy.
- Poor reduction of tooth structure with occlusal interference.
- Damage to adjacent tooth during crown preparation.
- Inappropriate size crown to maintain arch length.
- Poor marginal adaptation and gingival health.
- Poor cementation.
Quiz 1

Indications for use of stainless steel crowns:

• Restoration of primary or young permanent teeth with minimal carious lesions.
• Restoration of hypoplastic teeth.
• Restoration of molars following pulpectomy.
• Restoration of Turner’s tooth.
Quiz 2

Forms of Stainless Steel Crowns:

• Artglass crowns
• Pre-veneered SSC
• Pre-contoured SSC
• Paedo jacket crowns
Quiz 3

Instruments used for SSC preparation:

- Red stone
- No 114 pliers
- No 800-417 crown pliers
- No 110 Howe pliers
Quiz 4

- The buccal gingival contour of the second primary molar is described as a frown.
- The buccal gingival contour of the first primary molar is like a smile.
- The gingival contour of the lingual surface is a smile.
- The proximal gingival contour is a stretched S.
Acknowledgement