Lec.11 **Crowns in pediatric dentistry** Class 5

Caries is one of the most common infections affecting the teeth of children. Restoration of these is very important so as to re-establish the lost function like mastication and speech. The restoration that is placed should have the same lifespan as that remaining for tooth and should also protect the remaining tooth structure. Even though the primary teeth are a temporary dentition with known life expectancies, the clinician should select the best choice of restorative materials.

FULL COVERAGE CROWN FOR POSTERIOR PRIMARY TEETH

1. Stainless steel crowns
2. Nickel-base crowns
3. Tin-base crowns
4. Aluminum-base crowns

Stainless steel crowns

The crowns are available clinically in different sizes for both primary and permanent molar teeth individual. They are available from size 2 to 7.

Indications

1. Extensive carious lesions:

a. Insufficient tooth surface to retain an amalgum

or composite resin filling.

b. Tooth with caries involving three or more surface.

c. Children with rampant caries.

d. As a preventive measure in children who are in high caries risk group like handicapped children.

2. In teeth with developmental defects like amelogenesis imperfect, dentinogenesis imperfecta to prevent the loss of vertical dimension .

3. Following pulpal therapy in primary and young permanent teeth where full crown is contraindicated .

4. Severe bruxism.

5. As abutment for:

a. Space maintainer when indicated

b. Distal shoe appliance.

c. Fixed habit breaking appliances d. Fixed prosthetic appliances

6. Malformed teeth.

Contraindications

1. Nearly exfoliating primary teeth.

2. Patients allergic to nickel.

3. Mechanical problems.

4. Caries beneth level of bone.

Armamentarium

Stainless steel crowns set.

Crown cutting scissors

Adams pliers

Contouring plier (Johnson114)

Crimping pliers(Unitek 800-108)

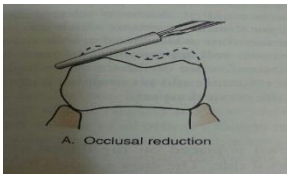
Preparation

_ Preoperative occlusion evaluation

_ Occlusal reduction (1-1,5mm)

_ Proximal reduction

_ B/L bevel and roundation of all angels



Reduction of occlusal height

A large flat diamond bur or diamond stone is used to reduce cusps, following the occlusal anatomy until the tooth is completely out of occlusion.

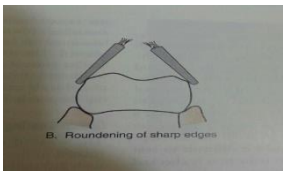
Occlusal reduction 1-1.5 mm.

Check reduction with opposite arch.

Proximal reduction

Wooden wedges are used in the interproximal embrasures to reduce the risk of damage to the adjacent tooth enamel. The bur is swept buccolingually across the proximal surface, beginning at the marginal ridge and at an angle slightly convergent to the occlusal surface (do not over taper). Break the contact with the adjacent teeth and produce a knife-edge finish line.

Roundening line angles

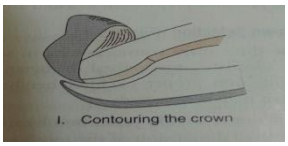


All line angles created by the occlusal preparation and proximal reductions are rounded. Moving the bur at an angle of 45˚ rounds the occlusobuccal and lingual surfaces. The other line angles are slightly rounded into the proximal preparation to avoid any sharp margins.

Crown Adaptation

Place the crown on the lingual side and rotate it toward buccal side. the crown should fit loosely, with 2-3mm excess gingivally with ascaler, scratch around gingival margin on the crown this indicate the gingival contour ,as well as portion of the crown to be removed. Remove the crown from the prepared tooth and with help of crown and bridge scissors,cut the crown 1mm below the scratch line. Smoothen the edge with finishing burs. Retry the crown on the tooth, if there is blanching it may be necessary to rescribe the crown and retrim it .check the gingival extent of the crown ,it should be not more than 1mm buccally and 0.5 mm lingually.

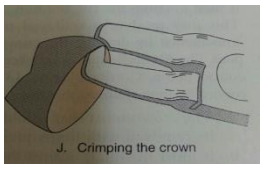
Contouring



Its done with the help of No.114 Johnson contouring pliers, bend the gingival third of the crown inward to restore anatomic margin and reduce margin circumferences.it has the advantage of the crown being more retentive.

Crimping

This is very important to the gingival health of supporting tissue using No417 crimping pliers the crown is crimped in gingival third .the procedure involve the pliers walked through the entire crown continuously without lifting. After completion of crimping there will be gradual bend in the gingival third of crown. The uses of crimping are protection ,prevention of leakage of cement, prevention of contamination and adequate retention.


J. Crimping the crown

Finishing and polishing

Use heatless stone to smooth the edge, then rubber wheel to remove scratches then polish it with Tripoli and rouge.

Cementation

Clean the crown and the tooth, fill the crown with appropriate cement, seat the crown expressing cement from the margins and press it into occlusion. Remove excess cement when partially set.

Full coverage crowns for the anterior primary teeth

INDICATIONS

- Anterior primary teeth with large interproximal lesions
- Anterior primary teeth with hypoplastic defects
- Unaesthetic anterior primary teeth due to discoloration.
- Anterior primary teeth that have undergone pulp therapy with significant loss of tooth structure
- Anterior primary teeth with significant tooth loss due to trauma or caries.
- Anterior primary teeth with small carious lesions and with large areas of cervical discoloration.

The types of full coverage for anterior primary

teeth currently available are:

- Stainless steel crowns

• Open faced steel crowns

• Pre-veneered steel crowns

• Resin (composite) strip crowns

• Zirconium crowns

Tooth preparation

Reduce incisal edge 1- 1.25mm.

Reduce the interproximal surfaces by 0.5 to 1 mm. The interproximal walls should be parallel and the gingival margin should have a feather edge.

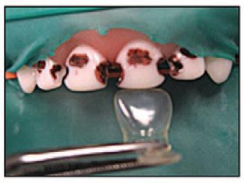
Reduce the facial surface by 1mm and the lingual surface by 0.5mm.

Create a feather-edge gingival margin.

Round all line angles.

Composite strip crowns

Composite strip crowns are composite filled celluloid crowns forms. They have become a popular method of restoring primary anterior teeth because they provide superior aesthetics as compared to other forms of anterior tooth coverage. Composite strip crowns rely on dentin and enamel adhesion for retention. Therefore the lack of tooth structure, the presence of moisture or hemorrhage contributes to compromised retention. They are less resistant to wear and fracture more readily than other anterior full coverage restorations.



1. Select a primary celluloid crown form with a mesio-distal incisal width equal to the tooth.
2. Remove decay with a medium to large round bur on a slow speed handpiece. If pulp therapy is required do it at this time.
3. Reduce the interproximal surfaces by 0.5 to mm.
4. The interproximal walls should be paralleland the gingival margin should have a feather edge.
5. Reduce the facial surface by 1mm and the lingual surface by 0.5mm.
6. Create a feather-edge gingival margin.
7. Round all line angles.

8. Trim the selected crown by removing the collar and the gingival excess material with crown and bridge shears.
9. Place a small vent hole on the lingual surface with a bur or explorer to allow escape of trapped air when the composite filled crown is seated.

10. Fit the crown on the prepared tooth.
11. The crown should extend 1mm below the gingival margin.
12. Select the appropriate shade of composite (extra light).
13. Etch the tooth with acid gel for 15 seconds, wash and dry the tooth, and apply bonding agent.
14. Seat the filled crown form on the tooth.

15. Remove the excess material from the vent hole and the gingiva.
16. Polymerize the material from both the facial and lingual directions.
17. Remove the celluloid form the tooth.
18. Very little finishing is required except for adjusting the occlusion and smoothing gingival margins.

Use flame shaped and rounded composite finishing burs for finishing.

Zirconium crown are now available for restoring anterior primary teeth they are directly bonded to the tooth, esthetically pleasing ,stronger than enamel and dentin and offer some advantage such as natural appearance biocompatibility and are minimally invasive.