Caries Management
Posterior Full Coverage

Stainless Steel Crowns – SSC
Preformed Metal Crowns – PMC
Crows in Pediatric Dentistry

<1950, gold was about $35 per ounce
~$343 in today’s dollars
Last night, gold bullion was ~$1,189 per ounce
Zabrina
Zabrina
Zabrina
Zabrina
Bling

Flaitz & Agostini, “Gingival disease associated with a decorative crown,”
*Ped Dent*, 24:1, 2002
At present there are no studies that show that grills are harmful to the mouth—*but there are no studies that show that their long-term wear is safe*, either.

Some grills are made from non-precious (base) metals that may cause irritation or metal-allergic reactions.

(More later during the lecture on “Adolescent Patients”)

Monday, May 16, 16
Porcelain Fused to Metal
Porcelain Fused to Metal
Preformed Acrylic or Polycarbonate
Stainless Steel Crowns

- “SSC”
- Introduced to the profession in the 1950’s by Humphries
- Primary and permanent teeth
- Utilize the tooth’s natural undercut for their retention
Caries Management
Posterior Full Coverage

Stainless Steel Crowns – SSC
Preformed Metal Crowns – PMC
Prefabricated crown forms that are adapted to individual teeth and cemented with a biocompatible luting agent
AAPD Consensus Statement

- **Stainless Steel Crowns**
  - Primary molars that have caries lesions, in children at high risk, may be treated with SSCs
  - Children with extensive decay, large lesions, or multiple surface lesions in primary molars should be treated with SSCs
  - Strong consideration should be given to the use of SSCs in children who require general anesthesia for restorative care
  - There is evidence from case reports and one randomized controlled trial supporting the use of preformed metal crowns in permanent teeth as a semi-permanent restoration for the treatment of severe enamel defects or teeth with gross decay
Common Brands

- Rocky Mountain
- Unitek™
- 3M™ ESPE™ (Old Ion Crown)
- Hu-Friedy Pedo Crown
# Composition – austenitic steel

<table>
<thead>
<tr>
<th>Stuff</th>
<th>Unitek</th>
<th>3M ESPE (&quot;New Ion&quot;)</th>
<th>Original Ion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>69%</td>
<td>65%</td>
<td>6-10%</td>
</tr>
<tr>
<td>Nickel</td>
<td>10-11%</td>
<td>8-11%</td>
<td>72%</td>
</tr>
<tr>
<td>Chromium</td>
<td>17-19%</td>
<td>18-20%</td>
<td>14-17%</td>
</tr>
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</table>
Nickel Allergy Signs & Symptoms

Rash or bumps on the skin
- Itching, which may be severe
- Redness or changes in skin color
- Dry patches of skin that may resemble a burn
- Blisters and draining fluid in severe case

Sensitized from nickel contact in the form of
- Jewelry
- Body piercings

Dermatitis
A disorder affecting the upper layers of the skin, which can be the result of allergic or nonallergic factors.

Abstract

- **Some metallic materials in dental prostheses may cause allergic hypersensitivity.**
- Symptoms appear not only in the oral cavity, but also on hands, feet or the entire body.
- Release of metal ions is thought to cause the allergic reactions; micro-particles of the corrosion products of the metal and/or ionic metal hydroxides/oxides may be the allergens.
- The study purpose was to review clinical surveillance of dental allergic hypersensitivity in our dental hospital (Japan). A total of 148 patients (69.8%) had one or more positive patch test reactions.
- The most common allergens were nickel (25.0%), palladium (24.4%), chromium (16.7%), cobalt (15.9%) and tin (12.5%).
- Typical allergic symptoms and diagnoses were Pustulosis palmaris et plantaris, lichen planus, stomatitis and contact dermatitis.
- *This study indicates that dentists and dental researchers should be concerned about the allergenic potential of dental metal materials.*

- **RESULTS:** A lack of high-validity longitudinal studies of the prevalence of nickel hypersensitivity in patients before and after orthodontic treatment and in appropriate controls was noted.

- From the studies retrieved, no statistically significant difference between the odds for a positive patch-test result before orthodontic treatment and after the placement of the appliances was observed.

- Orthodontic patients with no cutaneous piercing or with skin pierced have no statistically significant differences of nickel hypersensitivity after treatment compared with the general population.

- **CONCLUSIONS:** Orthodontic treatment is not associated with an increase in the prevalence of nickel hypersensitivity unless subjects have a history of cutaneous piercing.
Although nickel is the most common cause of contact allergy, nickel-containing orthodontic appliances seldom cause adverse reactions that result in discontinuation of treatment. We report on an eruption of dermatitis in the face and neck of an adult female patient after placement of a rapid maxillary expansion appliance (RME). Because the patient suspected nickel allergy, her tolerance to the appliance material was tested intraorally before treatment by cementing bands on four teeth for a week. No visible adverse reactions were seen during the test. One week after cementation of the RME appliance, the patient reported strong itching of the face and a red rash. Clinical examination showed itchy papular erythema on the face and neck. No intraoral reactions or symptoms were present. The RME appliance was removed, and symptoms disappeared in 4 to 5 days. The patient was referred for a nickel patch test, which gave a strong positive result. Adverse patient reactions of potential allergic origin should be diagnosed carefully, and their possible impact on further treatment should be evaluated accordingly.
While contact dermatitis to nickel is common, contact mucositis to the nickel component of dental devices rarely occurs.

A 2-year old boy with multiple nursing bottle decay underwent restorative treatment with stainless steel crowns.

One month later, he developed gingival inflammation that progressed to severe ulcerative contact gingivitis. Patch tests revealed that he was sensitized to nickel.

After a battery of prescreening patch tests to the materials for restorative treatment, the patient was successfully treated with composite resin crowns.
Austenitic Stainless Steels

- Contain nickel as well as chromium
- Sometimes referred to by the generic title 18/8
  - i.e., 18% chromium, 8% nickel
  - although the actual composition may vary widely from these figures
- Non-magnetic and cannot be hardened by heat treatment
  - Although they strain harden rapidly when cold worked
Austenitic Stainless Steels

- All stainless steels (except hardened Martensitic steels) are ductile and therefore can be formed
  - Austenitic types are outstanding in this respect
- Amongst the most highly corrosion-resistant materials available
Strain Hardened

- Work harden
  - Increase hardness and strength by plastically deforming or working a metal at temperatures below its recrystallization temperature.
  - An intra-crystal phenomenon which creates a measurable increase in a metal's hardness with an accompanying loss of ductility when its crystals undergo plastic deformation and retain certain unrelieved internal stresses.
Rocky Mountain (no longer available)

- Long straight sides
- Not strained hardened
- Mucho chairside adaptation
Unitek™

- Slightly longer than tooth
- Parallel walls
- Festooned margins
- Slightly contoured
- Some strain hardening
- Shallow anatomy
  - Less tooth reduction
- Thicker occlusal surface
- Universal – more uses
3M ESPE™

- (Original) High nickel
- Fully shaped
  - Constricted cervical
  - Contoured
  - Crimped
- Fully strain hardened
- Thin gingival edge
- Deep anatomy - more accurately duplicates natural tooth anatomy
  - Requires more occlusal reduction
Hu-Friedy Pedo Crown
(copied from the Company)

- New to the market
- Pre-trimmed and crimped
  - Speeds and simplifies their insertion
  - Soft and adaptable gingival margin and lateral areas
    - Simplifying additional trimming and/or crimping
- The occlusal anatomy accurately mimics that of the natural tooth
- The occlusal thickness of this stainless steel molar resists abrasion and perforation
As an aside...

- 3M ESPE Gold anodized aluminum temporary crowns
- Gold anodization eliminates metallic taste and galvanic shock for greater patient comfort
- Medium-hard aluminum base that will not easily deform and minimizes bite-through
- Pretrimmed gingival contour for minimal trimming
- Parallel wall design to save time by minimizing belling of the crown

And some dentists out there are passing them off as real gold crowns
Indications for Use

- High risk
- Large carious lesion
- Amalgam/resin poor choice
- Caries on three or more surfaces
- Extent of caries
- Rampant caries
- Recurrent caries
- Pulp therapy

- Hypoplastic enamel
- Developmental defects
  - Dentinogenesis imperfecta
  - Amelogenesis imperfecta
- Fractured teeth
- Vertical height
- Retention
- Temporary coverage
- $$$
- Consideration for GA case
Indications – large carious lesion
Indications – poor amalgam
Indications – 3+ surfaces
Indications – line angle
Indications – hypoplastic teeth
Indications – developmental anomalies
Indications - fractures
Indications – vertical height
Indications – appliance retention
Goals

- Reestablish proper occlusal height
- Reestablish normal mesiodistal dimension
  - Maintains arch length
  - Maintains spatial relationship
- Cause no periodontal pathology
- Last the useful life of the tooth
Longevity/Cost Effectiveness

- Low replacement frequency when compared to amalgam restorations.

<table>
<thead>
<tr>
<th>Molar</th>
<th>Class I</th>
<th>Class II</th>
<th>SSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1° First</td>
<td>75%</td>
<td>70%</td>
<td>13%</td>
</tr>
<tr>
<td>1° Second</td>
<td>32%</td>
<td>71%</td>
<td>11%</td>
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- Source ASDC Journal 46(6) 1979
### Longevity/Cost Effectiveness

Data From Studies Comparing Preformed Metal Crowns with Multisurface Amalgam Restorations in Primary Molar Teeth

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<tr>
<td></td>
<td># Placed</td>
<td>Failures</td>
<td># Placed</td>
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<tr>
<td>Braff 1975</td>
<td>150</td>
<td>131 (87%)</td>
<td>76</td>
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Longevity/Cost Effectiveness

Multiple Studies

- Restoration of choice in multisurfaced restorative procedures
- Placing/replacing cost per tooth is lower for SSC when compared to amalgam

  - **Braff 1975**
    - Using fees for 1975 period
      - Cost per tooth per month (average of 2.6 years usefulness)
        - SSC = $0.94
        - Amalgam = $1.34

  - **Eriksson 1988**
    - Placement/replacement
      - Total cost of treatment with amalgam 35% higher than SSCs

  - **Messer 1988**
    - Placement/replacement
      - Amalgam = 2 cost units
      - SSC = 3 cost units
      - *These data included the cost of pulp therapy as well*
Procedure
Procedure

The procedure for preparing any tooth for restoration with a SSC is unique.

You are creating a preparation to fit an existing crown form rather than attempting to fabricate a crown to fit an ideal tooth preparation.
Procedure

There are three areas you prepare
- Occlusal
- Mesial
- Distal
What, No Facial & Lingual Reduction?

- **NO!**
  - Well, that’s not really true
    - Mandibular first primary molar
    - Lost mesiodistal dimension
Common Clinical Error

Preparing the tooth as you would for a cast restoration
About the Slide Series

STAINLESS STEEL CROWN RESTORATIONS

Posterior Teeth
Mesial & Distal Caries
Evaluate the Arch
Check Occlusion
Contralateral Side as Well
To Begin
Optional – measure M-D Distance
Wedge PRN
Occlusal Reduction ~ 1–2 mm
Using Grooves as Guide
Reproduce the Anatomy

Using Grooves as Guide
Reproduce the Anatomy
Using Grooves as Guide
Football Diamond
Anatomy of Stainless Steel Crown Dictates Amount of Occlusal Reduction

Deeper occlusal anatomy of the crown necessitates more occlusal reduction
Interproximal Slices  - Just into the Sulcus
Follows Anatomy
Convergent to the Occlusal
What type of finish line?
Finish Lines

- Three common types:
  - Feather Edge
  - Chamfer
  - Shoulder
Finish Lines

CHAMFER

SHOULDER
Stainless Steel Crowns Require A Feather Edge
Feather Edge Just Into Sulcus

(may be modified by caries)
Shaded Area = Prepped Area
Check for Ledges
Avoid Ledging – Prevents Crown Seating
Round External Line Angles
Reverse Bevel - In Occlusal Third Only

~35-40 degrees
Rounded Line Angles
Returns Cusp Tips To Original Position Buccal-Lingually
Shaded Area = Prepped Area
Check for Proper Reduction
Check by

- Visual Inspection
- Floss Loop
- Wax Imprint
Crown Selection
Sometimes Trial & Error
Compare M-D Measure With Sizes
Seat & Scribe
Trim 1 mm Below Mark

- Check for blanching of the tissue
  - Generally indicates the crown is too long and needs trimming
  - Rule of thumb – sulcus is 2mm deep, so be halfway between margin and attachment
Crown & Collar Shears
Heatless Mizzy

Begin Adaptation

- Can be frustrating
- Gives ‘goodness of fit’ to the last one millimeter of the crown
- Use pre-contoured and pre-crimped crowns when possible
114 Contouring Pliers
Ball Inside/Cup Outside
Stabilize With Fingers, Press Down With Pliers
Or, Use 118 Ortho Pliers
Focuses on Margin
(this is theoretically how the crown stays on)
Close . . .
Check Contact
Check Occlusion/Blanching

Severe blanching indicates a crown too long.
800-417  Crimping Pliers  (Arch Bending)
Designed to Work Last 0.5 mm
Again, a Rocking Motion
Closes Crown Margin
Finishes Midpoint ~ 1mm
Tight Fit
Ideal

Smooth and Polish Margin

Heatless Mizzy
Extraoral Metal Polishing Kit
Perio? Multiple Studies

- No change in gingival health if well-made SSC
- No appreciable increase in plaque score
- Gingivitis due to plaque accumulation, not mechanical irritation
- No polishing procedures produces a plaque resistant surface

- Unpolished surfaces do attract more plaque, but not significant
- Gingiva adjusts to polished or unpolished surface
- Defects in adaptation do contribute to gingivitis
- Age dependent – older patients show an increased bleeding index

“The extent of plaque accumulation and frequency of gingival problems associated with stainless steel crowns in primary teeth seem to be unexceptional.”

“A well-adapted crown margin facilitates good oral hygiene and healthy gingivae but gingivitis can occur if the crown margins are inadequately contoured or if residues of set cement remain in contact with the gingival sulcus.”

“Good- to moderate- fitting crowns seem to produce minimal gingival problems or plaque accumulation.”
Occlusion/Blanching/Contacts
Place a gauze throat drape prior to cementation
Anatomy

- Right bronchus
- Larger diameter
- Smaller divergence angle
- Greater airflow
Luting
Generally Use Glass Ionomer Luting Agents
Rock From Lingual to Buccal for Mandibular Crown
Check Contralateral Side As Well

Ideal Occlusion

Biting the crown into place
Do Not Overseat (e.g. bite stick)
Clean As Directed By Luting Agent’s Manufacturer
Do Not Disturb Margins
Polish & Clean Contact Area With Knotted Floss
Abscess?
Special Considerations

- Permanent molars
- Tight contact
- Inadequate contact
- Occlusal surface enhancement
- Adjacent SSCs
- SSC & Adjacent Class II amalgam
- Arch length loss
- Decay extending below SSC margin
- Crown too large at the gingival area
- Crown too small at the gingival area
- Esthetic consideration
Special Considerations

- Permanent molars
- Tight contact
- Inadequate contact
- Occlusal surface enhancement

- Adjacent SSCs
- SSC & Adjacent Class II amalgam

- Arch length loss
- Decay extending below SSC margin
- Crown too large at the gingival area
- Crown too small at the gingival area
- Esthetic consideration
Permanent Molars

- Objects are the same
- Consider that the SSC is not the final restoration for the tooth
  - Preparations do not jeopardize the eventual preparation for a precision laboratory fabricated crown
Tight Contact

- Especially with fully shaped crowns
- Flatten contact with #110 Howe (How) pliers
Inadequate Contact

- Use contouring pliers to ‘bulge out’ the interproximal area
- Add silver solder to contact area, as if an inlay or gold drown
Occlusal Surface Enhancement

- Reason: increase wear necessary due to bruxism
- Add silver solder to inside of crown
Adjacent SSCs

- Prepare at the same time
- The shared interproximal area generally needs more reduction than if you were preparing for a single crown
- Try the crowns separately and together
- May need to flatten one or both of the contact areas prior to cementation
SSC & Adjacent Class II

- Generally cut the crown prep first
  - Use your own judgment
- Adapt and cement crown first
- Condense amalgam against the newly established and SSC defined contact area
Arch Length Loss

- SSCs are manufactures to fit a tooth with an ideal mesiodistal-to-bucccolingual ratio
- Caries may allow drifting into the area destroyed
- More preparation is needed
  - Facial and lingual reduction

Monday, May 16, 16
Arch Length Loss – “Ideal Ratio”
Arch Length Loss
Arch Length Loss

- Prep the facial and lingual as well as the interproximal and occlusal
Decay Extending Below SSC Margin

- Use a longer crown, or
- Fill proximal box with amalgam-composite-glass ionomer and prepare a traditional crown prep; this will result in a crown/amalgam finish line, or
- Spot weld and solder an extension of 0.004” ortho matrix to the deficient area
Crown Too Large At Gingival Area

- Cut crown on the facial or lingual
- Squeeze free ends so that they overlap
- This reduces the gingival dimension
- Adapt to tooth and scribe a line at overlap
- Remove, spot weld, solder and polish prior to cementation

“Boots on a Rooster” – FU Perry, DDS
Crown Too Small At Gingival Area

- Cut crown on the facial or lingual
- Stretch over tooth and remove
- Spot weld ortho matrix on one free side of slit
- Retry on tooth and scribe a line at overlap of matrix and crown
- Remove, spot weld, solder, polish prior to cementation
Removing a Cemented Crown
And Now for Something Completely Different

The Hall Technique
Shaded Area = Prepped Area
Finishes Midpoint ~ 1mm
Nicola P Innes*, Dafydd JP Evans and David R Stirrup, “The Hall Technique; a randomized controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 23 months”

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The Hall Technique embraces changing concepts of managing dental caries, moving from the dogma requiring its complete surgical excision, even at the expense of cavity size and pulpal health, to the understanding that caries in dentine can be slowed, arrested, and possibly even reversed, within a meticulously sealed environment.

The technique is named after Dr Norna Hall, a general dental practitioner from Scotland, who developed and used the technique for over 15 years until she retired in 2006. A retrospective analysis of the outcomes for the teeth she treated in this way was published in the British Dental Journal in 2006.
Nicola P Innes*, Dafydd JP Evans and David R Stirrups, “The Hall Technique; a randomized controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 23 months”

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General dental practice based, split mouth, randomized controlled trial (132 children, aged 3–10). General dental practitioners (GDPs, n = 17) in Tayside, Scotland (dmft 2.7) placed conventional (Control) restorations in carious primary molars, and Hall Technique PMCs on the contralateral molar (matched clinically and radiographically). Dentists ranked the degree of discomfort they felt the child experienced for each procedure; then children, their carers and dentists stated which technique they preferred. The teeth were followed up clinically and radiographically.

In summary, both Hall PMCs and Control restorations could be provided for the great majority (≥ 97%) of children in the study, and in a similar time. However, the Hall Technique was assessed by GDPs as causing significantly less discomfort compared with conventional restorative techniques, and was preferred to Control restorations by a significant majority of patients, carers and GDPs. This study supports other work indicating that the progress of dentinal caries can be significantly slowed, and perhaps even arrested, beneath a well sealed restoration. After two years, Hall PMCs were a more successful method for managing caries in primary molars than the Control restorations placed by GDPs in this high caries risk group, both for signs/symptoms of pulpal disease and longevity of the restorations. The Hall Technique appears to offer an effective treatment option for managing dental caries in primary molar teeth.
Scottish Dental

Technique - (after Evans & Innes)

**Size** - Try on crowns until one is seen to cover the occlusal table of the tooth but not impinge on the teeth on either side and there is a feeling of “spring back”. If the contact points are tight or or there has been loss of mesio-distal width of a tooth due to marginal ridge fracture, placing orthodontic separators through the mesial and distal contacts can be useful when fitting crowns.

**Fill** - The glass ionomer is mixed to the consistency of a regular crown luting cement (a thick paste). Load crown generously (it should be almost full with cement). Take care fill the crown from the base upwards and ensure that there is cement around the walls. Be careful to avoid air blows and voids.

**Locate and Seat** - Some glass ionomer may be wiped on the tooth or placed in any cavitation to improve the seal. The crown is placed evenly over the tooth and engaged in the approximal contact points using finger pressure to secure its position. The child then bites down on the crown. Some operators find biting on a cotton wool roll helps the process. Care is taken to ensure the crown seats evenly over the tooth.
Technique - (after Evans & Innes)

**Wipe** - As soon as the crown is fitted, the child should be asked to open to allow the crown position to be checked and excess glass ionomer can be wiped away.

**Seat Further** - When you are satisfied that the crown is in the optimal position, and whilst the cement is still soft, the child should be instructed to bite down again on the crown or cotton wool. It is likely that some more glass ionomer will be extruded. The child should keep pressure on until the cement has set, this prevents the crown from rising back up.

**Check and Clean** - The fit of the crown should be checked. Excess cement can be wiped away whilst wet or a hand excavator used when dry. Dental floss should be used to clear the contacts of any excess.

Blanching usually disappears within minute. The occlusal discrepancy should resolve in a few weeks.
Technique

“As the Hall Technique involves no occlusal reduction before, the procedure is inevitably associated with a premature contact following cementation, and an increase in occlusal vertical dimension. On second primary molars caused slightly more of an increase than on first primary molars. However, for all the 129 cases where data were available, (providers) recorded that an even occlusal contact had re-established at the one year recall.”
Recent Studies

Supports the claim that altered occlusal contact (MI) due to SSC placement reestablishes to normal after a period of time.
Precision of an instrumentation-based method of analyzing occlusion and its resulting distribution of forces in the dental arch.

Koos, B., Godt, A., Schille, C., & Göz, G

Abstract

BACKGROUND AND OBJECTIVE:
The percentage distribution of forces per tooth ranged from 0 to 41%. The mean measurement per tooth was 6.9% of the maximum total force exerted. The measurement error was 1%, the 1.96-fold measurement error calculated according to Bland & Altman (accuracy) was 2% and the 2.77-fold measurement error (reliability) was 2.8%. Neither changing the foil nor the repeated measuring had any statistically significant influences on the measured value.

RESULTS:

The measuring technique studied is superior to the usual methods, particularly with regard to force analysis per tooth. The level of accuracy is acceptable and no interference arising from change of foil or repeated measuring was detected. The method presented in this study therefore enhances routine diagnostics with marking foils. A combination of this method with marking foils would be ideal because the pressure-sensitive foils in this system do not produce any contact markings intraorally. This combination enables the contacts depicted on the computer to be assigned intraorally with even greater precision.
Assessment of occlusion after placement of stainless steel crowns in children – a pilot study

S. GALLAGHER*, B. C. O’CONNELL† & A. C. O’CONNELL*  
*Division of Public and Child Dental Health, Dublin Dental University Hospital, Dublin, and  †Division of Restorative Dentistry, Dublin Dental University Hospital, Dublin, Ireland

SUMMARY Many stainless steel crowns (SSCs) disrupt the occlusion in children, but stabilisation appears to occur within a short period post-placement. The extent and mechanism of these short-term occlusal changes in children are unknown. This study sought to determine whether placement of a SSC changes the maximum intercuspatation position (MIP) in children, whether the MIP returns to normal within 4 weeks and whether local anaesthesia had an effect on the child’s ability to achieve MIP. The T-Scan® III was used for the measurement of occlusal contacts. Reliability and reproducibility of the system was determined using a calibration exercise where MIP recordings were taken of eleven children not undergoing any dental treatment. For the main study, the percentage of total occlusal force on each tooth was recorded in 20 children preoperatively, after local anaesthesia, after SSC placement and 4 weeks postoperatively. There was no significant difference in MIP (P = 0.435) preoperatively and post-administration of local anaesthesia. There was a significant difference between the preoperative force on a tooth and the reading after crown placement (P = 0.0013, Wilcoxon test). By 4 weeks, there was no significant difference overall between post-SSC placement and the preoperative value for the tooth (P = 0.3). Administration of local anaesthesia did not affect the ability of a child to attain MIP. Maximum intercuspatation position was disturbed by the placement of a SSC in seven of 20 cases. When MIP was disturbed, in most cases, it returned to preoperative status within 4 weeks of crown placement.

KEYWORDS: paediatric dentistry, dental occlusion, crowns, restorative dentistry, local anaesthesia, dental care for children, dental materials

Accepted for publication 11 May 2014

Abstract

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Maximum intercuspation position was disturbed by the placement of a SSC in seven of the 20 cases. When MIP was disturbed, in most cases, it returned to preoperative status within 4 weeks of crown placement.”

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Anterior Stainless Steel Crowns
Anterior Stainless Steel Crown

- (+) Increased functional stability
- (-) Esthetics is sacrificed
Preparation Summary

- All finish lines are featheredges
  - Positioned just in to sulcus - as with posterior crown (later)
- Interproximal slices slightly convergent towards the incisal (not shown)
- Reduce the incisal approximately 1.5 to 2 millimeters
- Reduce the cingulum enough to yield 1 millimeter incisal clearance with mandibular teeth
- Facial reduction is at a minimum
  - ~0.5 millimeter at gingiva
  - Increase as you approach the incisor to ~ 1 millimeter
Crown Adaptation

- Place preselected crown over prepped tooth
- Check for proper extension in the sulcus
  - Should be ~1.0 mm below free gingival margin
- Crown’s gingival margin should be festooned to mirror the cementoenamel junction
- Contour with #118 pliers
- Crimp with #137
- Use glass ionomer cement
Esthetic Consideration
New Polycarbonate Product

the PedoNatural Crown®
Because children need to smile!
Procedure Overview From Website

**Fig. 1a**
Reduce the occlusal/incisal surface a minimum of 2mm. (Fig. 1a)

**Fig. 1b**
Reduce the buccal (or facial) surface a minimum of 1mm. **IMPORTANT:** The buccal (or facial) preparation must be carried subgingival. (Fig. 1b)

**Fig. 1c**
Reduce the lingual surface a minimum of 1mm. **IMPORTANT:** The lingual preparation must be carried subgingival. (Fig. 1c)

**Fig. 1d**
Reduce proximal surfaces so that all contact is broken and there is adequate clearance. (Fig. 1d)
Procedure Overview From Website

Select a crown that has the appropriate mesial-distal dimension. Try the selected crown on the tooth prior to cutting off the identifier tab to verify the correct size. (Fig. 2a)

When the identifier tab is cut off there will be a small plastic stub remaining. (Fig. 2c)

When satisfied that the correct size crown has been selected, remove the identifier tab by cutting it off with a sharp scissor. (Fig. 2b)

The remaining plastic stub is easily removed using a coarse sandpaper disc on a slow speed handpiece. (Fig. 2d)
Procedure Overview
From Website

Posterior Crimping
Before crimping  After crimping

Anterior Crimping
Before crimping  After crimping
Originally recommended IRM/ZOE; now recommends any commercially available self-adhesive resin cement
PedoNatural Crown®
Because Children Need To Smile!

ESTHETIC FULL CROWN RESTORATION FOR THE PRIMARY DENTITION
NuSmile ZR Crowns

Quick Start Guide - NuSmile ZR Zirconia Posterior

Step 1: Pick the right size
Choose the appropriately sized crown for the space and evaluate occlusal relationship. Crown size can be determined using NuSmile ZR Try-In Crowns and should be done prior to tooth preparation.

Step 2: Initiate preparation
Remove 1-1.5mm from the occlusal surface following the natural occlusal contours.

Step 3: Supragingival reduction
Open interproximal contacts and reduce entire clinical crown by 20% (or 0.5-1.25mm). The resulting preparation will be parallel to slightly converging occlusally.

Step 4 and Step 5: Create margin and refine
Carefully extend and refine the preparation margin to a feather-edge approximately 1-2mm subgingivally with a thin, tapered diamond. Check that no undercuts or subgingival ledges remain. Round all line angles of prepared tooth.

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Refer to NuSmile ZR Crowns Technical Guide for more detailed information.
NuSmile ZR Crowns

Quick Start Guide - NuSmile ZR ZIRCONIA Posteriors

**Step 6:** Test the fit

**Method 1:** Use NuSmile ZR Try-In Crowns to avoid contamination with saliva or blood of NuSmile ZR Crown’s prepared internal surface.

**Method 2:** Use the NuSmile ZR Crowns selected for the patient. If contamination with saliva or blood occurs, clean internal surface with Ivoclean® or sandblast with aluminum oxide.

**Step 7:** Prepare for Cementation

Clean teeth of saliva, blood or debris and control gingival hemorrhage.

Use high performance luting cement, resin cement, RMGI or GI. Hold crowns in place until cement sets or is tack cured. Clean up.

**Step 8:** Fill Position. Clean up.

Check occlusion; if a NuSmile ZR Crown is in high occlusion, the opposing teeth may be adjusted as necessary.

When multiple teeth are being restored, try all crowns together to ensure they fit well and seat passively. If crowns do not fit passively, refine the preparation of the tooth to fit the crown. NuSmile ZR Adjustment Burs may be used to shorten the gingival margin as necessary.

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*Refer to Ivoclar Vivadent - www.ivoclarvivadent.com

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