2015 ‘Hands-on’ Tooth Preparation Course
Teachers / Demonstrators: Peter Briggs & Raj Dubal 18\textsuperscript{th} September 2015

Anterior Tooth Preparation Course for Dental Foundation Trainees - SGH Simulation Centre
Al or Zi based and Glass Bead Ceramics

- Stronger
- Aesthetics better - no Metal dark shine through
- Cheaper – no precious metal
- Accurate fit

Practice

The anterior all-ceramic crown: a rationale for the choice of ceramic and cement
B. Mizrahi

- The two main families of all-ceramic crowns are high strength Al or Zi based and glass-based ceramics.
- The indications and techniques for their use differ.
- The decision-making process should be scientifically based.
- The cementation technique is specific for each type of all-ceramic crown and cement used.

The full coverage, all-ceramic restoration of an anterior tooth is a challenging clinical situation for which a variety of all-ceramic systems and cements are available. The decision-making process involves the consideration of a number of factors such as underlying substrate colour, tooth preparation geometry, margin location and cementation system. This article discusses the rationale behind these factors and presents a logical and scientific-based sequence for the decision-making process. A clinical case is presented to demonstrate the requirements and materials necessary for the optimal resin-bonded anterior crown.

Introduction

The crowning of anterior teeth incisors is a demanding procedure. The patient’s aesthetic expectations are usually high and the final result is largely dependent on the skill of the dental technician. It has been shown that in the hands of the average dental technician, all-ceramic systems exhibit potential for more shade matches than metal ceramic systems. It is thus not surprising that all-ceramic crowns on anterior teeth are growing in popularity.
"I'M TRULY IMPRESSED: IT WORKS. WHAT ELSE CAN I SAY!"

August Bruguera, Dental Technician, Spain.
Outcome – Kaplan-Meier CSR = 94.8% at 8 years (cementation type / technique and region of mouth not significant)

Clinical results of lithium-disilicate crowns after up to 9 years of service.

Gohr M, Wohltart S, Retal R, Reich S, Ederhoff D

Abstract

OBJECTIVES: The purpose of this prospective study was to evaluate the clinical outcome of anterior and posterior crowns made of a lithium-disilicate glass-ceramic framework material (IPS e.max Press, Ivoclar Vivadent).

MATERIALS AND METHODS: A total of 104 single crowns were placed in 41 patients (mean age, 34 ± 9.6 years; 15 male, 26 female). Eighty-two anterior and 22 posterior crowns were inserted. All teeth received a 1-mm-wide chamfer or rounded shoulder preparation with an occlusal/incisal reduction of 1.5–2.0 mm. The minimum framework thickness was 0.8 mm. Frameworks were laminated by a prototype of a veneering material combined with an experimental glaze. Considering the individual abutment preconditions, the examined crowns were either adhesively luted (59.2%) or inserted with glass-ionomer cement (30.8%). Follow-up appointments were performed 6 months after insertion, then annually. Replacement of a restoration was defined as failure.

RESULTS: Four patients (10 crowns) were defined as dropouts. For the remaining 94 crowns, the mean observation time was 79.5 months (range, 34–109.7 months). The cumulative survival rate according to Kaplan-Meier was 97.4% after 5 years and 94.8% after 8 years. Applying log rank test, it was shown that the location of the crown did not significantly impact the survival rate (p = 0.74) and that the cementation mode did not significantly influence the occurrence of complications (p = 0.17).

CONCLUSIONS: The application of lithium-disilicate framework material for single crowns seems to be a reliable treatment option.

CLINICAL RELEVANCE: Crowns made of a lithium-disilicate framework material can be used clinically in the anterior and posterior region irrespective of an adhesive or conventional cementation when considering abutment preconditions.

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Task 3 - E-Max Anterior Crown

Full-Coverage Restorations

ANTERIOR CROWN PREPARATION

- Butt joint margin
- 1.0-mm reduction at gingival margin
- Butt joint margin
- 1.0-mm to 1.5-mm facial reduction
- 1.5-mm lingual contact clearance
- Rounded internal line angles
- 1.5-mm to 2.0-mm incisal reduction
- Football-shaped finishing bur
e.max core can be used in several ways

- Full Crown
- Anatomically correct coping
- Cutback crown and lingual band
- Multilayer crown
E-max

CAD CAM or Pressed:
• Layered
• Monolithic
• Hybrid (using the advantages of both layered (labial) and the monolithic full-thickness core (palatal))
Which is best and why?

TLC offers IPS e.max® in both monolithic and layered states.

When a crown is called monolithic this means it is fabricated in full contour from a single block of material. The weakest link in traditional PFM's and other ceramic restorations is the porcelain layer over the substructure. In many cases the porcelain can chip or fracture from the substructure and ultimately cause the restoration to fail. Monolithic crowns have no such weakness.

We also offer layered crowns. Though the monolithic press is stronger than a layered one you can achieve even better esthetics with a layered crown. IPS e.max® layered offers the high translucence and lifelike esthetics you look for in an anterior crown.

Benefits of monolithic
- Monolithic material offers greater flexural strength and no chipping of the porcelain veneer.
- Provides a balance of versatility and simplicity
- Best for Posterior

Benefits of layered
- The ultimate cosmetic restoration
- Gentle to opposing dentition
- Best for Anterior
Monolithic full contour e-max (400MPA) – v – ‘Layered’ e.max – (90 MPA)
Do not do this please:

If you must – then use monolithic e.max as bridge framework:
‘Monolithic’ full contour e.max (400MPA)

- 1.0 to 1.2 mm occlusal depth to achieve appropriate occlusal anatomy.
- 1.2 to 1.5 mm functional cusp tip reduction.
- 0.7 mm gingival chamfer reduction
- 6-8 degree taper to the axial walls
3rd Task – a ‘Layered’ e.max anterior all-ceramic crown
‘Layered’ e.max anterior crown

- **Occlusal Reduction:** 2.0mm reduction
- **Butt Margin:** 1.0 - 1.2 mm circumferential shoulder reduction (with round internal line angle)
- **Taper:** 6-8 degree taper to axial walls
- **Overall wall reduction:** 1.5 mm in all aspects
3rd Task - A Layered e.max anterior all-ceramic crown

- **1.2mm butt joint** margin at gingival margin – all rounded angles
- **1.5mm** of facial, axial and palatal reduction
- **2mm** reduction of incisal tip
- **1.5-2.0mm of palatal clearance** in area of occlusion
Satisfactory 2  Unsatisfactory 0

Total Score for Layered e.max Anterior Full Ceramic Crown = 15

Reflective learning comments:

Things I need to improve on: 

Things I did well: