

1478 Preliminary Evaluation of the Effect of Crown on Gingival Color

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Objectives: The purpose of this study is to analyze the effect of various crown systems on the color of the buccal marginal gingivae around the crown by means of a spectrophotometer in comparison with adjacent gingivae. **Methods:** Five volunteer patients in need of a maxillary anterior single crown with intact adjacent natural incisors were included in this study. Uniform chamfer-type tooth preparations were performed for all teeth. **Four different crowns, 1.PFM (cast), 2.Captex, 3.IPS Empress and 4.Porocera were fabricated for each prepared tooth by one dental technician.** All porcelain-metal crowns were designed to have a metal-porcelain junction margin. **Gingival color was measured** at ten 1.0 mm² spots using a spectrophotometer (Olympus MSC-2000) and color coordinates L*, a*, b* and C* were obtained. The color difference dE, dL*, da*, db* and dC* with the gingivae of the adjacent natural tooth were calculated and are shown below. ANOVA and Fishers PLSD test were used for data analysis.

Crown Type	dE	dL*	da*	db*	dC*
PFM	9.75±2.6	-5.73±4.36	-4.56±2.57	-4.86±1.88	-6.67±1.71
Captex	5.19±3.19	-2.49±3.96	-1.30±3.16	-1.65±2.20	-2.12±2.21
Empress	7.57±3.56	-5.18±4.47	-0.88±3.24	-3.58±1.75	-2.82±2.53
Porocera	6.62±3.05	-3.88±3.53	-2.01±2.79	-3.55±1.99	-3.76±2.01

Results: PFM crowns produced the lowest gingival L*, a*, b* and C* values. Captex crown created the highest L*, b* and C* values and Empress crowns, the highest a* values. Captex crowns produced the lowest dE, dL*, db* and dC* values vs. adjacent gingivae. There was a significant difference between PFM and Captex for dE (p<0.05) and db* (p<0.05). The mean C* values of PFM was significantly lower than Captex (p<0.01), Empress (p<0.05) and Porocera (p<0.05). **Conclusions:** Different crown systems had significantly different effects on the surrounding marginal gingiva. In this preliminary experiment the gingivae around **Captex crowns had the closest appearance to the gingivae of the adjacent natural teeth.**

[Seq #159 - Assessment of Color and Esthetics](#)

12:30 PM-2:30 PM, Thursday, 11 March 2004 Hawaii Convention Center 321-B

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Cementation Evaluation

CAPTEK – Substrate To Cement Shear Bond Strength

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University Portland, OR and University of California, Los Angeles, USA)

The CAPTEK crown is fired on a refractory die material which confers a rough internal surface that may potentially provide greater bond strength to luting cements. The study evaluated the effect of surface treatments and cements on CAPTEK substrate shear bond strength. CAPTEK tabs were fired and type III gold alloys cast into tabs. The tabs were imbedded in epoxy leaving one surface exposed for surface treatment. Eight specimens in each group were made: CAP=CAPTEK Au* cast gold. Treatment included P-Pickling solution divestment, A* alumina abrasion, T=tin plating. Adhesive/cements were ZP* Zinc phosphate, PAN=PANAVIA 21 (J. Morits), AB=Primer B + All Bond C&B Luting Composite (Bisoo), ENF=ProBOND + Enforce (Dentsply, Caulk). Metal Surfaces were treated, cements cured in plastic matrices, samples stored in 37 C water for 7 days, thermalcycled 1000x between 5 and 50 C, and sheared at the interface with a universal testing machine.

Mean Bond Strengths:

<u>Substrate</u>	<u>AU</u>	<u>AU</u>	<u>AU</u>	<u>CAP</u>	<u>CAP</u>	<u>CAP</u>	<u>CAP</u>	<u>CAP</u>	<u>CAP</u>	<u>CAP</u>
TX	A	A	AT	A	P	A	AT	P	A	A
Cement	AB	PAN	PAN	ZP	PAN	PAN	PAN	AB	AB	ENF
Shear (Mpa)	11.90	18.53	18.99	0.42	1.93	10.94	12.71	1.36	10.17	4.09

One-Way ANOVA and multiple range analysis (F=52.0104, P>0001) Shearbond strength of various cements to CAPTEK were not significantly different from cast gold: Aluminum abrasion significantly increased bond strengths Panavia 21 and All-Bond cement were not significantly different.

Company comments: Aluminum abrasion is necessary only if retention and resistance form is lacking. When using aluminum oxide recommended pressure is 10-15 lbs only.

Captek Alloy Reduces Dental Plaque Accumulation

M. Goodson*, Itzhak Shoher, S. Imber and S. Som
(Forsyth Dental Center, Boston; Tel-Aviv U. Sch. of Dent. Med., Tel-Aviv)

Abstract for the IADR Conference in 1999

Published Journal of Periodontal Research 2001

Abstract Summary

Clinicians have observed that tooth surfaces restored with Captek appeared relatively plaque free and were associated with more healthy periodontal tissues.

1. The sites restored with Captek have approximately 1/10 the bacteria of normal tooth structure.
2. Analysis of the larger data set indicated that the presence of the “red complex” periodontal pathogens (*P. gingivals*, *B. forsythus* or *T. denticola*) was significantly less at sites restored by Captek.
3. The largest numerical group difference in samples was associated with lowered numbers of streptococci at sites restored by Captek.
4. These results indicate that sites restored by Captek alloy harbor lower numbers of bacteria than natural tooth sites, particularly streptococci and periodontal pathogens.

PRELIMINARY STUDY REPORT OF TEL-AVIV UNIVERSITY

Bacterial Attachment to Metal – Composite: A Preliminary Report:

“(a) Bacterial growth could virtually not be detected on the surface of the metal-composite while it could clearly be observed on the controls (natural tooth enamel and smooth light cure composite –I.S.)”

“(b) Not only the polished metal surface but also the unpolished rough surface of the metal composite samples were almost free of bacterial growth”

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The Surface Free Energy of Gold Alloy Systems

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Objective: A gold composite material (Captek™) has been developed which is claimed to resist the deposition of plaque. This study's aim was to compare its surface free energy (SFE) with that of a type III casting gold.

Methods: Contact angle measurements, using the Wilhelmy technique, were made on four bar-shaped samples of each material, using five test liquids (diiodomethane, ethylene glycol, formamide, glycerol and water) and four measurements per sample per liquid. For each material, the dispersive, Lewis acid and Lewis base components of SFE (γ^D , γ^+ , γ^- respectively) were estimated using a Bayesian method.

Results:

<i>SFE Component</i>	<i>Gold composite estimate (mN/m)</i>	<i>95% confidence interval</i>	<i>Type III gold estimate (mN/m)</i>	<i>95% confidence interval</i>
γ^D	31.8	29.3 to 35.1	33.1	30.7 to 36.0
γ^+	1.2	0.66 to 1.9	0.16	0.024 to 0.44
γ^-	8.4	5.5 to 12.0	19.1	14.6 to 24.0

The two materials did not differ significantly in their γ^D values (95% confidence interval for gold composite minus Type III gold, -5.0 to +2.7). Both materials had low γ^+ values in common with most solids. The gold composite had a significantly lower Lewis base component of SFE than the Type III gold (95% confidence interval for gold composite minus Type III gold, -16.4 to - 4.9).

□

Conclusion: The difference between the materials could be related to the absence of non-precious metals and to the unique structure of the gold composite. It is hypothesized that difference in the γ^- component of SFE may be an important parameter in predicting plaque resistance.

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