AADR March 2010 Abstracts (Summer 2009 Students)

M. XU - CASE COMPLEXITY AND OUTCOMES EVALUATED USING ICON, DI AND ABOGS
B. BEZAK – MEASURING CLINICAL ATTACHMENT LOSS USING CONE BEAM COMPUTED TOMOGRAPHY
K.M. CHOO – INFLUENCES ON BOND STRENGTH OF ORTHODONTIC BRACKETS
I. HUH – INFLUENCE OF TOOTH BRUSHING ON SURFACE ROUGHNESS OF RESTORATIVE MATERIALS
R. KAROLL – DENTAL STATUS AMONG CHILDREN WITH AND WITHOUT SPECIAL NEEDS

1489 CASE COMPLEXITY AND OUTCOMES EVALUATED USING ICON, DI AND ABOGS

Saturday, March 6, 2010: 11:45 a.m. - 1 p.m.
Location: Exhibit Hall D (Walter E. Washington Convention Center)
Presentation Type: Poster Session
***M. XU**, M. HANS, D. BEESON, and M. VALIATHAN, Case Western Reserve University, Cleveland, OH*
Objective: To evaluate orthodontic case complexity and treatment outcome over five decades using ICON, DI and ABOGS. Methods: Pre- and post-treatment study models of 767 patients from the 1960s to mid-2000s were randomly selected. Measurements were obtained by multiple self-calibrated examiners. Pre vs. post-treatment and inter-decade pre and post treatment comparisons were analyzed using ANOVA. Results: Pre-treatment ICON scores ranged from 58.21±18.41 (SD) to 69.67±19.22 and post-treatment scores ranged from 13.23±6.15 to 28.03±11.55. ANOVA revealed post-treatment scores were significantly lower than pre-treatment scores ($P<0.05$) for each decade. Additionally, in 6 of 10 pre-treatment inter-decade comparisons and 9 of 10 post-treatment comparisons, the score of the more recent decade is significantly lower than that of the more distant decade ($P<0.005$). Total DI scores ranged from 9.71±5.82 to 14.53±6.00. Total ABOGS scores ranged from 8.67±5.88 to 17.64±8.45. ANOVA revealed that 5 of 10 inter-decade comparisons in DI and 7 of 10 in ABOGS had the significant lower score toward the more recent decade ($P<0.005$). Conclusion: ICON, DI and ABOGS show significant improvement between pre- and post-treatment in any given decade. Reduction in case complexity and improvement in treatment outcome are consistent from the 1960s to mid-2000s.

948 Measuring Clinical Attachment Loss Using Cone Beam Computed Tomography (CBCT)

Friday, March 5, 2010: 2 p.m. - 3:15 p.m.
Location: Exhibit Hall D (Walter E. Washington Convention Center)
***B. BEZAK**, A. DHILLON, and L. BAHL-PALOMO, Case Western Reserve University, Cleveland, OH*

Objectives: To assess reliability and accuracy of Cone Beam Computed Tomography (CBCT) to identify Clinical Attachment Loss (CAL), using clinical calculation of CAL as the gold standard. **Methods**: Two examiners were calibrated (intra-examiner, inter-examiner) in recording measurements on CBCT scans using 3D software. 57 subjects with mild to severe periodontitis underwent a clinical exam, and CAL was measured clinically by a board-certified periodontist. Then, participants underwent CBCT scanning (120kVp, 15mA). The scans were measured at four interproximal sites per tooth: the blinded examiner measured the distance in millimeters from the apical end of enamel to the crest of alveolar bone (CEJ-BM) at each site. The apical end of enamel was determined by relative densities between enamel and cementum or enamel and dentin. CEJ-BM values were correlated to the clinical gold standard. 4,798 sites were measured. 510 sites were identified clinically with CAL. **Results**: Examiner was calibrated at the start of data collection: 0.972, 95%CI (0.945-0.986), $p<0.001$, $\alpha=0.05$, $n=33$. Inter-examiner calibration was 0.923, 95%CI (0.850-0.961), $p<0.001$, $\alpha=0.05$, $n=33$. Examiner was calibrated at the completion of data collection: 0.979, 95%CI (0.958-0.990), $p<0.001$, $\alpha=0.05$, $n=33$. Spearman's Correlation Coefficient (rho) for CEJ-BM and CAL for all sites was 0.127, $p=0.004$, $\alpha=0.05$, $n=510$. At molar sites, rho=0.338, $p<0.001$, $\alpha=0.05$, $n=145$. At pre-molar sites, rho=0.195, $p=0.013$, $\alpha=0.05$, $n=162$. At anterior sites, rho=-0.059, $p=0.414$, $\alpha=0.05$, $n=191$. **Conclusion**: CBCT measurement protocol is reliable. Accuracy of CBCT measurements correlates with CAL gold standard measurements. There is a tendency to underestimate CAL overall, with a lesser tendency for underestimation in molar sites than in pre-molar sites.

1320 Influences on Bond Strength of Orthodontic Brackets

Saturday, March 6, 2010: 11:45 a.m. - 1 p.m.
Location: Exhibit Hall D (Walter E. Washington Convention Center)
*J.-H. PHARK[1], **K.M. CHOO**[1], S. DUARTE[1], and A. SADAN[2], [1]Case Western Reserve University, Cleveland, OH, [2]University of Southern California, Los Angeles, CA*

Objectives: The aim of this study was to examine the effect of enamel treatment, demineralization, resin infiltration, and aging on bond strengths of orthodontic brackets to human enamel.

Methods: Sixty extracted mandibular molars were selected, split in two halves, and randomly assigned into two groups: (1) orthodontic brackets bonded with self-etching primer (SE; Transbond Plus Self-Etching Primer), (2) orthodontic brackets bonded after 35% phosphoric acid followed by the application of a TEGMA/Bis-GMA primer (TE; Transbond XT Etching Gel+ Transbond XT Primer). Each tooth was then allocated into three experimental settings as: intact, non-demineralized (ND), demineralized (D), demineralized+resin infiltrated with ICON (DRI). For groups D and DRI the specimens were immersed in a demineralizing solution (pH=4.95) for 8 weeks. The specimens were tested for bond strengths after 24 hours and after artificial aging (20,000 thermal cycles). Shear bond strengths (SBS) was performed using a universal testing machine. Statistical analysis was calculated using ANOVA/Tukey's B post-hoc test at $\alpha=0.05$.

Results: (SBS±SD in MPa)

	Non-aged	Aged
TE-ND	152.5±45.8ab	245.7±52.5c
TE-D	202.2±57.1bc	259.2±44.0c
TE-DRI	202.9±37.0bc	187.9±38.3b
SE-ND	102.9±24.5a	139.5±67.5ab
SE-D	167.1±53.1ab	227.1±55.6c
SE-DRI	156.5±65.6ab	124.3±48.1a

Different letters indicate significant statistical differences.

Conclusion: SBS of orthodontic brackets are influenced by etching technique, demineralization, and artificial aging. Resin infiltration of demineralized enamel does not affect the bond strength of orthodontic brackets.

1052 Influence of Tooth Brushing on Surface Roughness of Restorative Materials

Friday, March 5, 2010: 3:30 p.m. - 4:45 p.m.
Location: Exhibit Hall D (Walter E. Washington Convention Center)
*J.-H. PHARK[1], **I. HUH**[1], A.C. BOTTA[2], S. DUARTE[1], and A. SADAN[3], [1]Case Western Reserve University, Cleveland, OH, [2]Case Western Reserve University and Sao Paulo State University, Cleveland, OH, [3]University of Southern California, Los Angeles, CA*

Objective: To measure wear and surface roughness of different direct restorative materials before and after artificial aging.

Methods: Eight direct restorative materials were tested (n=16): Filtek Supreme Plus CT, Filtek Supreme Plus A2E, Filtek LS, Herculite XRV, TPH3, Ketac Nano, Miris NR, and Tetric Evo Flow. Discs with standardized dimensions of 10mm diameter and 2mm thick were fabricated for each group. All specimens were polished with aluminum oxide discs (Sof-Lex). One half of each polished disc was protected with an adhesive tape, whereas the unprotected side was subjected to 20,000 tooth brushing cycles (200g/brushing stroke of 20mm). In addition, half of all specimens were artificially aged by 20,000 thermal cycles. Root-mean-square (RMS) roughness was measured by confocal laser scanning microscopy. Statistical analysis was performed using ANOVA with α=0.05.

Results: (RMS/SD in nm)

MATERIAL		RMS±SD	
		Non-aged	Aged
Miris 2 NR	Non-brushed	0.079±0.013	0.074±0.019
	Brushed	0.101±0.004	0.099±0.013
TPH3	Non-brushed	0.133±0.004	0.094±0.081
	Brushed	0.230±0.012	0.213±0.026
Filtek LS	Non-brushed	0.110±0.017	0.110±0.058
	Brushed	0.122±0.029	0.099±0.003
Herculite XRV	Non-brushed	0.085±0.033	0.062±0.017
	Brushed	0.199±0.030	0.103±0.064
Filtek Supreme Plus CT	Non-brushed	0.034±0.001	0.048±0.004
	Brushed	0.068±0.028	0.032±0.008
Filtek Supreme Plus A2E	Non-brushed	0.086±0.010	0.074±0.012
	Brushed	0.184±0.022	0.245±0.051
Tetric Evo Flow	Non-brushed	0.041±0.007	0.059±0.021
	Brushed	0.098±0.041	0.084±0.018
Ketac Nano	Non-brushed	0.150±0.02	0.103±0.032
	Brushed	0.211±0.088	0.191±0.098

Conclusions: Tooth brushing increases surface roughness regardless of material or aging.

1126 Dental Status among Children with and without Special Needs

Friday, March 5, 2010: 3:30 p.m. - 4:45 p.m.
Location: Exhibit Hall D (Walter E. Washington Convention Center)

***R. KAROLL**, M. HEIMA, S. NELSON, and G. FERRETTI, Case Western Reserve University, Cleveland, OH*
Background and Objectives: Many children with special health care needs (CSHCN) are receiving dental care in hospital based pediatric dental clinics. However, little is known about the extent of caries, and the type of treatment received by CSHCN. The objectives of the study is to compare caries status and type of treatment received by children with and without special health care needs (CSHCN vs. non-CSHCN) at a hospital based pediatric dental clinic. Methods: A random sample of 400 dental charts of subjects (age range: 0 to 17 years) receiving dental care between July 2005 to June 2009 was examined. Patient data abstracted from the charts were: age, sex, insurance type, and any types of special health care needs (medical, physical, psychological) the children had in addition to dental health status; decayed, missing, filled primary (dmft) and permanent teeth (DMFT) and treatment plan (filling, stainless steel crown (SSC), pulp therapy, and extraction). Data was analyzed using SPSS 17. Results: A total of 351 patient charts had complete data and were available for analysis. The sample's demographics were: mean age 5.42±3.65, 49.3% were male, 85.2% on Medicaid and 44.7% of subjects were CSHCN. CSHCN (n=157) were significantly ($p<0.05$) older than non-CSHCN (n=194). In addition, there was a significant gender difference ($p<0.001$) between the two groups; female in non-CSHCN was 59.8%, while male in CSHCN was 60.5%. However, Medicaid status and the mean dmft and DMFT were not different between the two groups. In types of treatment, the non-CSHCN had significantly ($p<0.05$) increased SSC and pulp therapy in the primary teeth compared to CSHCN, while primary teeth extractions were significantly ($p<0.05$) increased in CSHCN. Conclusion: The caries status of CSHCN was similar to non-CSHCN. But, treatment types differed with CSHCN receiving more extractions compared to restorations indicating.