

**681** Response to periodontal therapy compared in three risk groups Part II. W. KALDAHL\*, K. PATIL, K. KALKWARF, J. DYER (UNMC-Dental, Lincoln. UNMC-Medical, Omaha, UTHSC, San Antonio)

This study evaluated differences between 3 patient risk groups in their response to periodontal therapy. Seventy-eight patients with periodontitis were treated in a split mouth design with individual quadrants receiving root planing (RP), modified Widman (MW) or flap with osseous (FO) surgery. Following phase I and phase II therapy patients received supportive periodontal therapy (SPT) at 3 mo intervals for up to 5 yrs. Probing depth (PD) and clinical attachment level (CAL) were obtained from six sites around each tooth. Data were collected initially, 4 wks following phase I, 10 wks following phase II and prior to each SPT appointment. If a site lost  $\geq 3$  mm of CAL from baseline (post-phase II), it was classified as a breakdown site. The yearly incidence of breakdown (calculated for each patient during SPT) classified the patients into one of three groups: high (HI), medium (MI) or low (LI) incidence of breakdown. Following phase I (RP only) HI had less mean PD reduction and less mean CAL gain than MI and LI ( $p < 0.05$ ). Following phase II and during SPT, mean PD reduction in RP sites was HI<MI<LI ( $p < 0.05$ ). CAL gain during SPT was HI<MI<LI ( $p < 0.05$ ). Mean PD reduction was similar for all risk groups following phase II surgery (MW or FO) and was HI<MI<LI ( $p < 0.05$ ) by yr 5 of SPT. Mean CAL gain was similar following MW for all groups and HI group had less gain following FO ( $p < 0.05$ ). At yr 5 CAL gain in MW and FO sites was HI (loss)<MI and LI ( $p < 0.05$ ). Following phase II, PD reduction was RP<MW<FO and the CAL gain was FO<RP and MW ( $p < 0.05$ ) in each group. At yr 5 PD reduction in HI was RP<MW and FO and MW and RP<FO in MI and LI ( $p < 0.05$ ). At yr 5 HI had mean CAL loss with no difference between therapies. CAL gain in MI and LI tended to be RP>FO and MW. Supported by NIDR #DE06103

**682** Effect of cigarette smoking on periodontal healing following flap debridement surgery. A. SCABBIA\*, K.-S. CHO, C.-K. KIM, T. SIGURDSSON, L. TROMBELLI (Univ of Ferrara, Italy; Yonsei Univ., Korea, Loma Linda Univ., CA)

The purpose of the present parallel-design, controlled clinical trial was to evaluate the treatment outcome following flap debridement surgery (FDS) procedures in smokers compared to non-smokers. 58 systemically healthy subjects with moderate to advanced periodontitis, who presented one area (3 to 6 teeth) with persisting diseased sites after initial therapy, were selected. 29 patients (mean age 39.7 years, 20 males) were smokers, while 29 patients (mean age 43.9 years, 7 males) were non-smokers. Full-mouth Plaque (PII) and Bleeding on Probing (BoP) scores, probing depth (PD) and clinical attachment level (CAL) were assessed immediately before surgery and at 6 months postsurgery. PII and BoP scores significantly decreased in both smokers and non-smokers. PD reduction and CAL gain were greater in non-smokers ( $2.4 \pm 0.9$  mm and  $1.6 \pm 0.7$  mm, respectively) than in smokers ( $2.0 \pm 0.9$  mm and  $1.2 \pm 0.8$  mm, respectively), however these differences did not reach the statistical significance. When sites presenting baseline PD  $\geq 7$  mm were considered, smokers showed significantly less PD reduction ( $3.1 \pm 1.1$  mm) and CAL gain ( $1.9 \pm 1.2$  mm) compared to non-smokers ( $3.9 \pm 0.8$  mm and  $2.8 \pm 1.0$  mm, respectively). In smokers, there was a significant difference in mean CAL change in patients with smoking exposure  $>15$  packs/years ( $0.9 \pm 0.5$  mm) compared to those with a lower exposure ( $1.5 \pm 0.8$  mm). **The results of this study suggest that healing outcome following FDS procedures is impaired in cigarette smokers.** This study was partly supported by MURST grant # 97/60/06/014

**683** Clinical and Microbiological Response to Mechanical Periodontal Treatment in Chinese Adult Periodontitis Patients. D.H. LEE\*, K.Y. ZEE, L.P. SAMARANAYAKE (Faculty of Dentistry, The University of Hong Kong, Hong Kong)

The aim of this study was to investigate the initial clinical and microbiological response to mechanical periodontal treatment in Chinese adult periodontitis patients. A total of 19 patients, 32 to 51 years of age (mean 42.8) with at least one site per quadrant with probing pocket depth  $>5$  mm, were recruited. All sites were treated conventionally, including oral hygiene instruction, subgingival instrumentation and monthly review with supragingival prophylaxis. Probing pocket depth (PPD), probing attachment level (PAL), bleeding on probing (BOP) and presence or absence of supragingival plaque (PI) were measured before and at 3 months after treatment. Subgingival plaque samples were taken from the deepest site in each quadrant, using sterile paper points. Each sample was dispensed in reduced transport fluid (RTF) and cultured on non-selective media (Enriched Trypticase soy agar) using anaerobic techniques to obtain pure isolates. After subculturing, all the pure isolates were identified based on Gram stains, aerotolerance, esculin hydrolysis, nitrate reduction,  $\alpha$ -glucosidase,  $\beta$ -galactosidase and N-acetyl- $\beta$ -glucosaminidase activity and N-benzoyl-D-arginine-2-naphthyl-amide hydrolysis. Statistical analysis was performed by F-test based on ANOVA using SAS/GLM procedure. Clinical results at the end of 3 months showed that there were significant differences ( $p < 0.05$ ) in PPD and PAL. Mean PPD was reduced from  $7.5 \pm 1.6$  mm to  $4.1 \pm 1.8$  mm with a mean PAL gain of  $1.3 \pm 1.5$  mm. There was a significant reduction of PPI (90% to 26%) and BOP% (90% to 32%). Microbiological results showed a significant difference ( $p < 0.05$ ) in the proportions of Gram negative anaerobic rods and facultative cocci, Gram positive anaerobic rods, Gram positive facultative rods and cocci between baseline and 3 months. The mean frequency of detection of *Veillonella* spp., *P. intermedia*, *P. gingivalis* and *P. melaninogenica* before treatment was 47%, 35%, 29%, 18%, respectively and was reduced to 24%, 12%, 18%, 6%, respectively after the treatment. **The results indicate that mechanical periodontal treatment is clinically efficacious and reduces the putative periodontopathic microflora in Chinese adult periodontitis patients.** (This study was supported by HKUCRCG Grant 10201262)

**684** Effect of SRP on Relation of GCF IL-8 and Granulocyte Elastase to Periodontopathogens. L.J. JIN\*, W.K. LEUNG, E.F. CORBET, L.P. SAMARANAYAKE, W.I.R. DAVIES, B. SÖDER and P.-Ö. SÖDER (University of Hong Kong & Karolinska Institute, Sweden)

Neutrophilic granulocytes play a key role in host response to periodontopathogens. IL-8 is a potent chemotactic agent with a distinct target for the recruitment and activation of neutrophilic granulocytes. This study aimed to assess the effect of scaling and root planing (SRP) on IL-8 and the granulocyte indicator-elastase activity, and their relations to the presence of periodontopathogens in adult periodontitis (AP). The participants were 16 Chinese subjects with untreated AP. GCF and subgingival plaque were collected at baseline and 4 weeks after SRP. IL-8 levels were determined by ELISA. Granulocyte elastase was analyzed with a specific substrate (pGlu-ProVal-pNA) and the maximal rate of elastase activity (MR-EA) was calculated. DNA-probes were used to detect the presence of *A. actinomycetemcomitans* (A.a.), *B. forsythii* (B.f.), *P. gingivalis* (P.g.), *P. intermedia* (P.i.), and *T. denticulata* (T.d.), with a sensitivity  $\geq 10^3$  cells/sample. Overall, total IL-8/IL-8 concentration and MR-EA levels were significantly reduced after SRP with a corresponding reduction of total count of the target species ( $p < 0.001$ ). Of the pocket sites ( $\geq 5$  mm) co-infected by B.f., P.g., P.i. & T.d. at baseline, the sites with undetectable levels of B.f., P.g., P.i. & T.d. after SRP exhibited a significant reduction of IL-8 levels ( $p < 0.05$ ), MR-EA levels ( $p < 0.01$ ) and probing depth ( $p < 0.01$ ). No such change was found in the sites where the co-infection of B.f., P.g., P.i. & T.d. persisted. SRP resulted in either a reduction or an increase of IL-8 levels. A marked reduction of IL-8 levels was accompanied by a concomitant reduction of MR-EA ( $p < 0.01$ ) and probing depth ( $p < 0.001$ ), while no significant change of MR-EA levels and probing depth were noted in those pocket sites that exhibited a significant increase of total IL-8/IL-8 concentration following SRP. **This study suggests that the IL-8-associated granulocyte activity was related to the dynamic change of the target periodontopathogens following SRP. A dynamic shifting relationship between IL-8 and granulocyte elastase in GCF may characterize the varying short-term treatment response in periodontal pockets and risk for further periodontal destruction.** This study was supported by the University of Hong Kong (RCG, 338/250/0001) and the Karolinska Institute

**685** Periodontal Scaling. Effect on CD4+T Lymphocytes of HIV+/AIDS Patients. P.R. CAMPBELL\*, C.C. LOIACONO, D.W. SPENCER, and J.P. DEWALD (Baylor College of Dentistry, Dallas, Texas, USA)

The purpose of this study was to determine if periodontal scaling procedures are related to a change in the CD4+T lymphocyte count in patients with HIV+/AIDS. The study consisted of 5 dentate adult subjects who were diagnosed as having HIV+/AIDS and stabilized on antiviral medications for at least three months prior to participating in the study. Additionally, all subjects had an APA periodontal classification of either III or IV. Prior to receiving periodontal scaling therapy, each subject received a CD4+T lymphocyte blood test. The CD4+T lymphocyte blood test was repeated 8 weeks after initial therapy and the data are presented below.

Subject	1	2	3	4	5
Baseline	196	504	200	738	273
8 weeks	331	609	225	841	381

An increase in the CD4+T lymphocyte blood count was noted in all patients. The results were analyzed using the t-test for paired samples and showed a significant difference ( $p = 0.007$ ) between the baseline and 8 week CD4+T lymphocyte counts. The subjects reported no change in medications or illness during the test period. **The increase in the CD4+T lymphocyte tests indicated an improvement of the immune system. It appears from this research that periodontal scaling procedures have a significant effect on the immune system of HIV+/AIDS individuals.** This study was funded by the Baylor College of Dentistry Intramural Grant #F9602.

**686** Influence of Calculus Removal on the Treatment of Adult Periodontitis. R.V. OPPERMANN\* and G. BERND. (Dept. Periodontology, ULBRA, Brazil)

The aim of this study was to compare the clinical results of plaque removal, with and without removal of calculus, in the treatment of adult periodontitis. The protocol of this study was approved by the Committee of Ethical Affairs and the volunteers gave a written consent of their participation. Eight patients 35-60 years of age were selected. Clinical parameters used were, Plaque Index (PII), Gingival Index (GI), pocket depth (PD), levels of attachment (LA) and bleeding on probing (BOP). The data was registered after supragingival plaque control and up to 180 days following a modified Widman flap. During the surgical procedure half of the single-rooted teeth involved received scaling (SRP) and the other half, cleaning with a powder jet (JET). Statistical analysis of the results for the proximal surfaces (PS) and buccal-lingual surfaces (FS) were performed with the t-test for PD and LA and  $\chi^2$  for the other parameters. Results showed a significant increase in scores 0 for the PII and GI at the 180-day observation in both groups. The frequency of BOP showed, similarly, a significant reduction. The average PD at start was 5.58mm for the JET and 5.88mm for the SRP in the proximal surfaces and 3.40mm for the JET group and 3.52 for the SRP group at the buccal-lingual surfaces. The average PD at the 180-day examination was reduced significantly to 2.40mm and 2.38mm for the proximal surfaces of the JET and SRP as well as in the bucco-lingual areas where these values were 1.25mm and 1.17mm. The LA reductions were similar for the JET and SRP in the proximal surfaces, 0.85mm and 0.66mm respectively. At the bucco-lingual surfaces the LA reduction was 0.66mm for the JET group and 0.30 for the SRP group. **It can be concluded that under the experimental conditions of the study, both modalities of plaque removal resulted in a similar clinical response after treatment.**

**687** Furcation Debridement with a New Diamond Coated Sonic Scaler. G. AUPUSH\*, I.G. NEEDLEMAN, D.R. MOLES & H.N. NEWMAN (Eastman Dental Institute, London, UK)

Recently, diamond coated sonic instruments have been developed for the purpose of debriding furcations at the time of surgery. The aim of this study was to compare the efficacy of debridement of these new tips (Sonipar-KaVo) with conventional sonic inserts (Sonirecall-KaVo) and hand instruments (Gracey curettes) in both class II and III furcations. The study simulated open (surgical) debridement using a manikin head and standardised plastic teeth coated with marker deposit within the furcation. Efficacy of debridement was assessed by image analysis of marker area, 'tooth' weight loss and time taken for debridement. Analysis of variance showed Sonipar to remove significantly more marker than hand instruments (mean difference, Sonipar-hand=2.52 mm<sup>2</sup>, 95% CI 1.11 to 3.94,  $p < 0.001$ ) although the difference between Sonipar to Sonirecall did not achieve significance (1.28 mm<sup>2</sup>, 95% CI -0.13 to 2.69,  $p = 0.09$ ). No significant difference was observed between Sonirecall and Gracey curettes. Debridement took significantly less time with Sonipar than other instruments (mean difference, Sonipar-hand=98.3 s, 95% CI 74.1 to 122.4,  $p < 0.001$ , Sonipar-Sonirecall=74.3 s, 95% CI 46.6 to 102.0,  $p < 0.001$ ). Surprisingly, no significant differences were found for weight loss. **In this in vitro study, the Sonipar insert was a more efficient instrument for open molar furcation debridement in relation to marker area and debridement time, compared with Sonirecall and hand instruments.** Study supported by KaVo Dental Ltd

**688** Root Surface Removal After Subgingival Preparation With Four Different Instruments. C. ROBINSON\*, M.E. AICHELMANN-REIDY, R.A. YUKNA. (Louisiana State University School of Dentistry, New Orleans, LA)

A histologic analysis of root surfaces previously subgingivally treated to the point of clinical smoothness with either hand curettes (H), standard smooth ultrasonic tip (U), fine-grit (F) or medium-grit (M) diamond coated ultrasonic tips were evaluated to compare root surface removal. A previous study (Yukna et al., 1997) showed all performed equally well for calculus removal but there was concern excessive root structure removal might result with diamond-coated ultrasonic tips. Seven patients with four hopeless single rooted teeth each ( $\geq 5$  probing depth) were randomly treated with each of the 4 instruments. The teeth (N=28) were atraumatically extracted and decalcified. Horizontal semi-sagittal sections beginning 1 mm coronal to the most apical extent of treatment were performed. H&E stained (6 $\mu$ ) cross-sections were examined by light microscope and ocular grid at 40x magnification. The mean thickness of root surface removal was statistically similar for all 4 instrument types ( $p > 0.05$ ). The mean cementum removal was as follows: H =  $8.6 \pm 1.9 \mu$ , U =  $6.5 \pm 0.5 \mu$ , F =  $7.0 \pm 0.8 \mu$ , M =  $7.7 \pm 0.5 \mu$  and dentin removal H =  $8.7 \pm 2.5 \mu$ , U =  $5.1 \pm 3.2 \mu$ , F =  $11.4 \pm 1.9 \mu$ , M =  $6.2 \pm 1.4 \mu$ . Residual cementum thickness for each instrument was similar (H =  $2.7 \pm 0.8 \mu$ , U =  $2.1 \pm 0.8 \mu$ , F =  $1.9 \pm 1.2 \mu$ , M =  $2.0 \pm 1.0 \mu$ ). **These preliminary data suggest that the 4 instrument types are able to remove cementum and dentin similarly (MANOVA analysis) when used in moderate-severe periodontal pockets contrary to our clinical impression.** Supported by Dentsply Equipment Division & Louisiana Periodontics Support Fund