Orthodontic treatment and quality of life: a 24-month interim report

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Objectives: To evaluate if changes in patient perception of oral health-related quality of life (OHRQoL) occur following 2 years of orthodontic treatment.

Methods: A convenience sample of 11 to 14-year-old children were recruited: pediatric dental group (N=40); orthodontic group (N=50); and craniofacial anomaly group (N=44), which was further subdivided into unilateral (N=27) and bilateral cleft (N=17) groups. Subjects completed the Child Perceptions Questionnaire for 11 to 14-year-old children (CPQ11-14) at enrollment. The pediatric and craniofacial groups also completed the CPQ11-14 at 24 months, while the orthodontic group completed the CPQ11-14 six months post orthodontic treatment. The effects of group, time, group by time, group by gender, time by gender, and group by time by gender were investigated using Factorial ANOVA and the Tukey-Kramer method.

Results: Group type and time had significant effects on the total CPQ11-14 scores (P<0.05). Over time, the CPQ11-14 scores improved for all groups (P<0.05). Significant differences between the orthodontic group and the bilateral cleft group and between the bilateral cleft group and the pediatric group were present at the 24-month time point (P<0.05). It appears that a group by gender interaction may exist for all groups (P=0.0522). Data collection is continuing.

Conclusions: The OHRQoL for children ages 11-14 in all groups studied improved over time. Gender differences are suggested with males having greater improvement in their OHRQoL than females.

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Orthodontic microimplant stress generation

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Objectives: Currently several thread, tip and insertion techniques for orthodontic microimplants are used for anchorage. Although previous studies have determined microimplant pullout strengths, the stress generating characteristics have not been examined. The purpose of this study was to evaluate the stresses produced by different orthodontic microimplant thread and tip designs.

Methods: Composite photoelastic rectangular blocks were fabricated with individual simulants for curtural and trabecular bone. Self-drilling and self-threading implants of 1.7mm diameter (Stryker) and self-drilling implants of 1.6mm diameter (Rocky Mountain Orthodontics) were tested. All microimplants tested were 6mm long. The implants were inserted into the blocks according to manufacturers’ recommendations. Stresses generated from the different microimplant designs were analyzed immediately after insertion. Loads of 125, 175 and 225gm were then applied at 90 degrees to the long axes of the implants. Stresses were digitally photographed in the field of a circular polariscope and analyzed using a computer graphic program to quantify stress intensity.

Results: Widely different installation stresses were observed between the various microimplant designs. The least amount of lateral and apical stresses was seen with the self-threading microimplants. Self-drilling implants generated the highest lateral and apical stresses. Self-drilling systems with a fluted tip produced a fringe distribution similar to non-fluted self-drilling tips, but at a lower intensity. Applied forces on the implants altered stress intensity and distribution. The intensity modifications were relatively low compared to the installation stresses.

Conclusion: Installation stress distribution and intensity was primarily a function of microimplant design. Self-threading microimplant designs produced the lowest installation stresses. Increasing anchorage forces, within the clinically normal range, had less of an effect on stress distribution than the initial installation as dictated by microimplant design.


The effect of orthodontic treatment and splinting on gingival health

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Objectives: The aim of the present study was to evaluate the effect of orthodontic treatment and orthodontic splinting on gingival health.

Methods: The study population was drawn from patients who arrived for a routine dental check-up. Past orthodontic treatment and smoking habits were self-reported. Clinical examination included the following periodontal parameters measured for the anterior sextants: plaque index (PI), gingival index (GI), gingival recessions, probing depth (PD) and bleeding on probing (BOP). In cases where an extra-coronal bonded splint was present, the distance between the splint and the incisal edge of the teeth as well as from the cemento-enamel-junction (CEJ) was also measured.

Results: A total of 47 subjects aged 19 to 25 years (mean 20.82) participated in this study. The cohort consisted of 29 (61.7%) males and 23 (38.3%) females. Only 8 (17%) participants reported current smoking. Clinical examination revealed mean PD of 1.8mm; 16.2% of all sites exhibited BOP. Patient which underwent orthodontic treatment had significantly greater PD compared with non-orthodontic treated patients (1.86±0.2 vs. 1.66±0.3mm, p=0.0085). Localized gingival recessions were significantly more prominent in the splinted teeth compared to the non-splinted teeth (0.11 vs. 0.01mm, p=0.002). Likewise, PD, PI, GI and BOP were significantly greater for the splinted teeth.

Conclusions: Orthodontic treatment, especially when combined with post-orthodontic splinting may result in greater gingival breakdown. Consequently, meticulous oral hygiene and close monitoring is advised for these patients during and after therapy.

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