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## **Ultrasonic vs. Manual Toothbrushing in Orthodontic Patients with Manifest Gingivitis**

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### **Objectives:**

Plaque retention around orthodontic brackets increases the short term gingivitis risk and the long term caries risk in susceptible patients. It was, therefore, the aim of a randomized clinically-controlled study to compare the improvement (i) of plaque control and (ii) gingivitis control by ultrasonic vs. manual toothbrushing.

### **Methods:**

80 adolescents wearing fixed orthodontic appliances 6 month before removal and exhibiting  $\geq 4$  gingivitis teeth were randomly divided in 2 groups. The test group US (n=42) used the Emmi-dental ultrasonic toothbrush (EMAG, Mörfelden-Waldorf, Germany). The control group CT (n=38) used the manual toothbrush with oral hygiene tablets (Denttabs, Berlin, Germany). The Gingiva-Index was used at 6 points/tooth at baseline, after 3-day-plaque-regrowth at start of study, after 2 and 12 weeks. The modified Navy-Plaque-Index (Lang et al., 2011) was used at index teeth. Intra-oral photography documented all teeth at baseline, at start and end of study with blinded pre-brushing and post-brushing assessment of 6 planimetric fields around the brackets buccally and 6 fields lingually and palatally.

### **Results:**

Highly significant reduction of gingivitis was documented for both groups, number of Gingivitis Teeth from 13 to 4 in US and from 12 to 3 in CT. There was highly significant reduction of plaque index (Ultrasonic 9.59 BL to 0.45 End around brackets, Manual 9.64 BL to 0.64 End). Hard and soft tissue trauma have not been identified.

### **Conclusions:**

The study confirms earlier results of plaque reduction and contribution to gingival health (Denda, 2011 and May, 2013). The Emmi-dental Professional ultrasonic toothbrush used in a high risk cohort of subjects under orthodontic treatment and exhibiting chronic gingivitis is clinically effective in significant plaque reduction and highly significantly decreasing the number of gingivitis teeth. The improvement of oral hygiene is matching that of the control group. The advantage of ultrasonic brushing is the wear-free action.