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FEATURES SECTION

Evidence-based orthodontics

Structured abstracts of clinical trials

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An *in vivo* investigation into the use of resin-modified glass poly(alkenoate) cements as orthodontic bonding agents. 2001, **23,** 403–409. S. C. Choo, A. J. Ireland and M. Sherriff

Objective To assess the effectiveness of two resin-modified glass poly(alkenoate) cements for bonding orthodontic brackets to teeth.

Design A split-mouth randomized controlled trial.

Setting University of Bristol Dental Hospital.

Participants Twenty consecutive patients attending for upper and lower fixed orthodontic appliance therapy.

Interventions Experimental: two resin-modified glass poly(alkenoate) cements (Fuji Ortho LC, 3M Unitek™ Multi-cure Glass Ionomer). Control: Transbond APC™.

Outcome measures Bond failure over 1 year.

Results Bond failure rate over 1 year was 5.8 per cent for Fuji Ortho, 5.9 per cent for 3M Unitek™ Multi-cure, and 7.2 per cent for Transbond APC™. These differences were not statistically different (Fuji OR 1.4 95 per cent CI 0.4–4.7; 3M Multi-cure OR 1.0 95 per cent CI 0.3–3.7).

Conclusions There were no statistically significant differences between the failure rates of the bonding materials tested. The failure rates were found not to be affected by time.

Implications All the bonding materials tested had failure rates that are likely to be clinically acceptable. Although no statistically significant difference in the bond failure rates between the adhesives was found, the number of patients in the trial was small and so the study was under powered to detect these minor differences in bond failure rate. If, indeed, there isn't a clinically significant difference in failure rate, then the use of resin-modified glass poly(alkenoate) cements for bonding orthodontic brackets could be explored due to their potential advantage of being able to release fluoride which may reduce decalcification during orthodontic treatment. This could be the subject of another RCT.

American Journal of Orthodontics and Dental Orthopedics

The effect of pre-emptive and/or postoperative ibuprofen therapy for orthodontic pain. 2001, **120,** 20–27. M. K. Bernhardt, K. A. Southard, K. D. Batterson, H. L. Logan, K. A. Baker and J. R. Jakobsen

Objectives To compare the incidence and severity of pain after separator placement.

Design A three-armed, triple blind, randomized, placebo controlled trial.

Setting Orthodontic Department, College of Dentistry, Iowa, USA.

Participants Forty-one patients, scheduled to receive comprehensive orthodontic treatment by graduate students, with no complicating medical history, who were a maximum of 16 years old and a weighed a minimum of 88 pounds.

Interventions Ibuprofen (400 mg) or a lactose capsule, taken orally, 1 hour prior to appointment for separation and 400 mg ibuprofen or a lactose capsule, taken orally, 6 hours after the initial dose.

There was no group that received oral lactose on both occasions. The ibuprofen and lactose capsules were identical in appearance.

Outcome measures Degree of discomfort, measured on a 10-cm visual analogue scale, recorded at intervals during the week following separation.

Results Peak pain occurred upon rising the day following separation. At 2 hours after separation, and at

bedtime that day, patients who received ibuprofen preoperatively had significantly less pain than those who received a placebo. Subsequently there were no statistically significant differences between the pain reported by patients in each group.

Conclusions 400 mg ibuprofen, taken orally, 1 hour prior to separator appointment alone or in combination with a repeat dose 6 hours later, reduced pain on the day of treatment.

Implications It is probably worth suggesting that patients attending for separator placement take 400 mg ibuprofen, orally, 1 hour prior to the appointment and 6 hours after the initial dose.

Effects of combined application of anti-microbial and fluoride varnishes in orthodontic patients. 2001, **120**, 28–35. B. Ögaard, E. Larsson, T. Henriksson, D. Birkhead and S. E. Bishara.

Objectives To investigate the effect of a combination of anti-microbial and fluoride varnishes on the development of white spot lesions (WSLs), gingivitis, and plaque formation during fixed orthodontic treatment.

Design Randomized controlled trial.

Setting Orthodontic clinics in Falköping and Skövde, Sweden.

Participants Two-hundred-and-twenty patients, 12–15 years old, starting orthodontic treatment between 1994 and 1996.

Interventions Cervitec® (Vivadent, Schaan, Liechtenstein; 1 per cent chlorhexidine, 1 per cent thymol) or placebo Cervitec® (Vivadent; no chlorhexidine or thymol) and Fluor Protector® (Vivadent; 5 per cent difluorosilane) prior to and during treatment.

Outcome measures WSLs were assessed according to Gorelick *et al.*[1] Plaque levels were assessed using the visible plaque index (VPI). Gingivitis was assessed using the gingival bleeding index (GBI). Stimulated saliva and plaque samples were taken to assess their bacterial content.

Results Sixty-four patients (58 per cent) in the treatment group and 67 (61 per cent) in the control group developed WSLs during treatment. The prevalence of WSLs for the treatment group was 1.14 ± 0.08 and the control group 1.18 ± 0.10. There were no statistically significant differences between the prevalence of WSLs, VPI, and GBI in either group. The number of *mutans streptococci* (MS) in plaque was statistically significantly lower in the treatment group until 48 weeks after bonding, but not at debond.

Conclusions Cervitec® varnish significantly reduced the number of MS in plaque during the first 48 weeks of fixed orthodontic treatment. This did not result in a significant reduction in WSLs at debond.

Implications It appears that an anti-microbial varnish, in addition to a fluoride one, does not affect the incidence of WSLs following orthodontic treatment.

Reference

1. Gorelick *et al.* Incidence of white spot formation after bonding and banding. *Am J Orthod* 1982; **81**: 403–407.

Modified composite or conventional glass ionomer for band cementation? A comparative clinical trial. 2001, **120**, 49–53. T. J. Gillgrass, P. C. M. Bennington, D. T. Millet, J. Newell and W. H. Gilmour.

Objectives To compare the time to first failure, position of band failure and white spot enamel lesions (WSELs) during fixed orthodontic treatment.

Design A split mouth, randomized controlled trial.

Setting Orthodontic Department, Glasgow Dental Hospital, UK.

Participants Ninety-eight patients, contributing 140 band pairs, receiving fixed orthodontic treatment.

Interventions Band-Lok® (Reliance Orthodontic Products, Itasca, Illinois, USA) and Ketac-cem® (ESPE, Gmbh, Seefeld Oberay, Germany).

Outcome measures Band failure was identified as band loosening and recorded as the day patients attended for recementation. The amount of cement remaining on the tooth at deband was recorded. WSELs were assessed according to Geiger *et al.*[1]

Results The failed bands were in situ for a mean of 20.3 months (minimum 4.8, maximum 46.4). Seven bands (5 per cent) cemented with Bank-Lok® and four bands (2.8 per cent) cemented with Ketac-cem® failed. There was no significant difference ($P = 0.36$) in the band failure pattern between the two groups. There was a significant difference ($P < 0.001$) in the distribution of cement on the tooth/band at deband. Bank-Lok® remained predominantly on the band and Ketac-cem® on the tooth. This did not result in a significant difference ($P = 0.16$) in WSELs between the groups.

Conclusions There were no significant differences in the pattern of bond failure or WSELs between the two groups. Bank-Lok® failed predominantly at the enamel-cement interface and Ketac-cem® at the band-cement interface.

Implications Although Band-Lok® failed predominantly at the enamel-cement interface, rendering the tooth more susceptible to decalcification, this did not result in a significant increase in WSELs. The reduction in cement remaining on the tooth at deband has the potential for time savings.

Reference

1. Geiger *et al.* The effect of a fluoride program on white spot formation during orthodontic treatment, *Am J Orthod Dentofacial Orthop* 1988; **93**: 29–37.