

Self Ligating Bracket vs Twin Brackets Articles and Abstracts

- I. [http://www.ajodo.org/article/S0889-5406\(10\)00858-9/abstract](http://www.ajodo.org/article/S0889-5406(10)00858-9/abstract)

Duration of treatment and occlusal outcome using Damon3 self-ligated and conventional orthodontic bracket systems in extraction patients: A prospective randomized clinical trial

Introduction

This was a prospective randomized clinical trial comparing the effect of bracket type on the duration of orthodontic treatment and the occlusal outcome as measured by the peer assessment rating (PAR).

Methods

A multi-center randomized clinical trial was carried out in 2 orthodontic clinics. Sixty-two subjects (32 male, 30 female; mean age, 16.27 years) with a mean pretreatment PAR score of 39.40, mandibular irregularity from 5 to 12 mm, and prescribed extractions including mandibular first premolars were randomly allocated to treatment with either the Damon3 self-ligated or the Synthesis conventional ligated preadjusted bracket systems (both, Ormco, Glendora, Calif). An identical archwire sequence was used in both groups excluding the finishing archwires: 0.014-in, 0.014 × 0.025-in, and 0.018 × 0.025-in copper-nickel-titanium aligning archwires, followed by 0.019 × 0.025-in stainless steel working archwires. Data collected at the start of treatment and after appliance removal included dental study casts, total duration of treatment, number of visits, number of emergency visits and breakages during treatment, and number of failed appointments.

Results

Sixty-two patients were recruited at the start of treatment, and the records of 48 patients were analyzed after appliance removal. Accounting for pretreatment and in-treatment covariates, bracket type had no effect on overall treatment duration, number of visits, or overall percentage of reduction in PAR scores. Time spent in space closure had an effect on treatment duration, and the pretreatment PAR score influenced only the reduction in PAR as a result of treatment.

Conclusions

Use of the Damon3 bracket does not reduce overall treatment time or total number of visits, or result in a better occlusal outcome when compared with conventional ligated brackets in the treatment of extraction patients with crowding

II. [http://www.ajodo.org/article/S0889-5406\(14\)00088-2/abstract](http://www.ajodo.org/article/S0889-5406(14)00088-2/abstract)

Comparative assessment of alignment efficiency and space closure of active and passive self-ligating vs conventional appliances in adolescents: A single-center randomized controlled trial

Introduction

The aim of this study was to compare the time to initial alignment and extraction space closure using conventional brackets and active and passive self-ligating brackets.

Methods

One hundred adolescent patients 11 to 18 years of age undergoing maxillary and mandibular fixed appliance therapy after the extraction of 4 premolars were randomized with stratification of 2 age ranges (11-14 and 15-18 years) and 3 maxillomandibular plane angles (high, medium, and low) with an allocation ratio of 1:2:2. Restrictions were applied using a block size of 10. Allocation was to 1 of 3 treatment groups: conventional brackets, active self-ligating, or passive self-ligating brackets. All subjects were treated with the same archwire sequence and space-closing mechanics in a district general hospital setting. The trial was a 3-arm parallel design. Labial-segment alignment and space closure were measured on study models taken every 12 weeks throughout treatment. All measurements were made by 1 operator who was blinded to bracket type. The patients and other operators were not blinded to bracket type during treatment.

Results

Ninety-eight patients were followed to completion of treatment (conventional, n = 20; active self-ligating brackets, n = 37; passive self-ligating brackets, n = 41). The data were analyzed using linear mixed models and demonstrated a significant effect of bracket type on the time to initial alignment ($P = 0.001$), which was shorter with the conventional brackets than either of the self-ligating brackets. Sidak's adjustment showed no significant difference in effect size (the difference in average response in millimeters) between the active and passive self-ligating brackets (the results are presented as effect size, 95% confidence intervals, probabilities, and intraclass correlation coefficients) ($-0.42 [-1.32, 0.48]$, 0.600, 0.15), but the conventional bracket was significantly different from both of these ($-1.98 [-3.19, -0.76]$, 0.001, 0.15; and $-1.56 [-2.79, -0.32]$, 0.001, 0.15). There was no statistically significant difference between any of the 3 bracket types with respect to space closure. Space-closure times were shorter in the mandible, except for the Damon 3MX bracket (Ormco, Orange, Calif), where active and total space-closure times were shorter in the maxilla. No adverse events were recorded in the trial.

Conclusions

Time to initial alignment was significantly shorter for the conventional bracket than for either the active or passive self-ligating brackets. There was no statistically significant difference in passive, active, or total space-closure times among the 3 brackets under investigation.

III. [http://www.ajodo.org/article/S0889-5406\(07\)00363-0/abstract](http://www.ajodo.org/article/S0889-5406(07)00363-0/abstract)

Self-ligating vs conventional brackets in the treatment of mandibular crowding: A prospective clinical trial of treatment duration and dental effects

Introduction: The aim of this study was to investigate the duration of mandibular-crowding alleviation with self-ligating brackets compared with conventional appliances and the accompanying dental effects. **Methods:** Fifty-four subjects were selected from a pool of patients satisfying the following inclusion criteria: nonextraction treatment in the mandibular or maxillary arches; eruption of all mandibular teeth; no spaces in the mandibular arch; irregularity index greater than 2 in the mandibular arch; and no therapeutic intervention planned with any extraoral or intraoral appliance. The patients were randomly assigned to 2 groups: 1 group received treatment with a self-ligating bracket (Damon 2, Ormco, Glendora, Calif) and the other with a conventional edgewise appliance (Microarch, GAC, Central Islip, NY), both with 0.022-in slots. The irregularity index of the mandibular arch was normalized between the groups, and the time to alignment was estimated in days. Treatment duration was assessed by data modeling with the Cox proportional hazard regression. Lateral cephalometric radiographs were used to assess the alteration of mandibular incisor position before and after alignment. Measurements of intercanine and intermolar widths were also made on dental casts to determine changes associated with correction.

Results and Conclusions: Overall, no difference in the time required to correct mandibular crowding with Damon 2 and conventional brackets was observed. For moderate crowding (irregularity index <5), however, the self-ligating group had 2.7 times faster correction. This difference was marginally insignificant for subjects with irregularity index scores greater than 5. Greater crowding prolonged treatment by an additional 20% for each irregularity index unit. Increases in intercanine and intermolar widths associated with crowding correction regardless of bracket group were noted. The self-ligating group showed a statistically greater intermolar width increase than the conventional group. Also, an alignment-induced increase in the proclination of the mandibular incisors was observed for both bracket groups, but no difference was found between Damon 2 and conventional brackets for this parameter

Comparison of maxillary arch dimensional changes with passive and active self-ligation and conventional brackets in the permanent dentition: A multicenter, randomized controlled trial

Introduction

The purpose of this study was to compare maxillary arch dimensional and inclination changes during alignment with conventional brackets and self-ligation.

Methods

Ninety-six patients, ages 16 years and above, were included in this multicenter, 3-group parallel randomized trial. The main outcome measures were changes in maxillary intercanine, inter premolar, and intermolar dimensions, and molar and incisor inclination changes. The patients were randomly allocated in permuted blocks of 12 subjects into 3 equal groups with the allocations concealed in opaque sealed envelopes. Each participant underwent alignment with a standard Damon Q (Ormco, Orange, Calif) wire sequence for a minimum of 34 weeks. Blinding of clinicians and patients was not possible. Data were analyzed on a per-protocol basis, since losses to follow-up were minimal.

Results

Complete data were obtained from 87 subjects. Bracket type had no significant effect on any of the transverse dimensional changes. No difference in molar inclination was found between passive self-ligation and conventional brackets (0.67° ; 95% CI, -2.24 , 3.58 ; $P = 0.65$) or active self-ligation (0.91° ; 95% CI, -1.95 , 3.78 ; $P = 0.53$). Similarly, incisor inclination changes with the Damon Q could not be differentiated from those developing with either conventional system (0.44° ; 95% CI, -1.93 , 2.8 ; $P = 0.71$) or In-Ovation C (-0.22° ; 95% CI, -2.58 , 2.14 ; $P = 0.85$). No harms were encountered.

Conclusions

No difference in the arch dimensional or inclination changes during alignment can be expected between conventional brackets and either active or passive self-ligation.

Article Citation:

Peter G. Miles, Robert J. Weyant, and Luis Rustveld (2006) A Clinical Trial of Damon 2™ Vs Conventional Twin Brackets during Initial Alignment. *The Angle Orthodontist*: May 2006, Vol. 76, No. 3, pp. 480-485.

A Clinical Trial of Damon 2™ Vs Conventional Twin Brackets during Initial Alignment

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Abstract

The objective of this study was to compare the effectiveness and comfort of Damon 2 brackets and conventional twin brackets during initial alignment. Sixty consecutive patients participated in a split mouth design. One side of the lower arch was bonded with the Damon 2 bracket and the other with a conventional twin bracket. The sides were alternated with each consecutive patient. The irregularity index (II) was measured for each half of the arch at baseline, at 10 weeks at the first archwire change, and at another 10 weeks at the second archwire change. Any difference in discomfort was assessed within the first few days of archwire placement and again at the first archwire change. Comfort on the lips, preferred look, and bracket failure rates were also recorded. The twin bracket was more uncomfortable with the initial archwire ($P = .04$). However, at 10 weeks, substantially more patients reported discomfort with the Damon 2 bracket when engaging the archwire ($P = .004$). At both archwire changes at 10 and 20 weeks ($P = .001$), the conventional bracket had achieved a lower II than the Damon 2 bracket by 0.2 mm, which is not clinically significant. Patients preferred the look of the twin bracket over the Damon 2 ($P < .0005$) and more Damon 2 brackets debonded during the study ($P < .0005$). The Damon 2 bracket was no better during initial alignment than a conventional bracket. Initially, the Damon 2 bracket was less painful, but it was substantially more painful when placing the second archwire and had a higher bracket failure rate.

CONCLUSIONS

- The Damon 2 bracket was no more effective at reducing irregularity than the conventional twin bracket with elastomeric ligation.
- The Damon 2 brackets were initially less painful than the conventional twin bracket but were more painful when tying in the second archwire.
- Significantly more Damon 2 brackets debonded during the study.

VI. <http://www.angle.org/doi/abs/10.2319/112414837.1>

Article Citation:

Lian O'Dwyer, Simon J. Littlewood, Shahla Rahman, R. James Spencer, Sophy K. Barber, and Joanne S. Russell (2016) A multi-center randomized controlled trial to compare a self-ligating bracket with a conventional bracket in a UK population: *Part 1: Treatment efficiency*. The Angle Orthodontist: January 2016, Vol. 86, No. 1, pp. 142-148.

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Original Articles

A multi-center randomized controlled trial to compare a self-ligating bracket with a conventional bracket in a UK population: *Part 1: Treatment efficiency*

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ABSTRACT

Objective: To use a two-arm parallel trial to compare treatment efficiency between a self-ligating and a conventional preadjusted edgewise appliance system.

Materials and Methods: A prospective multi-center randomized controlled clinical trial was conducted in three hospital orthodontic departments. Subjects were randomly allocated to receive treatment with either a self-ligating (3M SmartClip) or conventional (3M Victory) preadjusted edgewise appliance bracket system using a computer-generated random sequence concealed in opaque envelopes, with stratification for operator and center. Two operators followed a standardized protocol regarding bracket bonding procedure and archwire sequence. Efficiency of each ligation system was assessed by comparing the duration of treatment (months), total number of appointments (scheduled and emergency visits), and number of bracket bond failures.

Results: One hundred thirty-eight subjects (mean age 14 years 11 months) were enrolled in the study, of which 135 subjects (97.8%) completed treatment. The mean treatment time and number of visits were 25.12 months and 19.97 visits in the SmartClip group and 25.80 months and 20.37 visits in the Victory group. The overall bond failure rate was 6.6% for the SmartClip and 7.2% for Victory, with a similar debond distribution between the two appliances. No significant differences were found between the bracket systems in any of the outcome measures. No serious harm was observed from either bracket system.

Conclusions: There was no clinically significant difference in treatment efficiency between treatment with a self-ligating bracket system and a conventional ligation system.

VII. <http://www.angle.org/doi/abs/10.2319/042312-338.1>

Article Citation:

Michael H. Bertl, Kanji Onodera, and Aleš G. Čelar (2013) A prospective randomized split-mouth study on pain experience during chairside archwire manipulation in self-ligating and conventional brackets. *The Angle Orthodontist*: March 2013, Vol. 83, No. 2, pp. 292-297.

doi: <http://dx.doi.org/10.2319/042312-338.1>

Original Articles

A prospective randomized split-mouth study on pain experience during chairside archwire manipulation in self-ligating and conventional brackets

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ABSTRACT

Objective: To investigate patient discomfort during archwire engagement and disengagement in patients treated with self-ligating and conventional brackets using a split-mouth design.

Materials and Methods: Eighteen consecutive patients (15 female, 3 male; age: 22.2 ± 6.4 years) who requested treatment with fixed orthodontic appliances were randomly assigned for bonding with SmartClip self-ligating brackets on one side of the dentition and conventional standard edgewise brackets on the other. During the course of treatment, patients rated the discomfort experienced during every archwire engagement and disengagement using a numeric rating scale. Results were evaluated for round and rectangular nickel titanium and rectangular stainless steel, titanium molybdenum, and Elgiloy archwires. Patients also rated their overall experience retrospectively for both bracket systems.

Results: Regardless of archwire type, disengagement was rated as being significantly more painful on the SmartClip side ($P = .027$). For rigid, rectangular archwires, engagement and disengagement were rated as being significantly more painful on the SmartClip side ($P = .031$; $P = .004$). Retrospective ratings favored conventional brackets beyond ratings recorded during treatment.

Conclusion: Engagement and disengagement of rigid rectangular archwires caused more pain with SmartClip self-ligating brackets than with conventional ones. Careful archwire manipulation and patience during full alignment are essential for limiting chairside pain. Low pain levels will help ensure treatment satisfaction and compliance.

VIII. <http://www.angle.org/doi/abs/10.2319/042312-338.1>

Article Citation:

A. Alper Oz, Nursel Arici, and Selim Arici (2012) The clinical and laboratory effects of bracket type during canine distalization with sliding mechanics. The Angle Orthodontist: March 2012, Vol. 82, No. 2, pp. 326-332.

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Original Articles

The clinical and laboratory effects of bracket type during canine distalization with sliding mechanics

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Abstract

Objective: To compare the extent of canine movement with sliding mechanics between a self-ligating (SC) bracket and a modified twin design (MT) bracket. To test the in vitro coefficient of friction (COFs) of these two metal brackets on 0.019- × 0.025-inch, stainless-steel arch wires.

Materials and Methods: For the clinical portion of this study, a split-mouth design was used to bond the brackets of 19 patients. Canine distalization was achieved on a 0.019- × 0.025-inch, stainless-steel arch wire with a nickel-titanium, closed-coil spring strained between a mini-screw and a canine bracket. The linear and angular measurements were performed using lateral cephalometric radiographs taken before and after canine distalization. A tribometer was also used to measure the COFs of the bracket types in vitro. For comparisons, Student's *t*-tests for paired and unpaired samples were used at the 95% confidence level.

Results: The extent of canine movement and the changes in the canine and molar teeth angles were not significantly different between the SC and MT brackets. After 8 weeks, the mean canine movements were 1.83 and 1.89 mm in the maxilla and 1.79 mm and 1.70 mm in the mandible with the SC and MT brackets, respectively. The mean COF of the MT brackets (0.21) was significantly lower than that of the SC brackets (0.37) during in vitro testing.

Conclusion: It is suggested that the rate of canine distalization was not different between the two groups, although in vitro COFs of the SC bracket was higher.

IX. <http://www.angle.org/doi/abs/10.2319/060809-322.1>

Article Citation:

S. Jack Burrow (2010) Canine retraction rate with self-ligating brackets vs conventional edgewise brackets. *The Angle Orthodontist*: July 2010, Vol. 80, No. 4, pp. 626-633.

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Original Articles

Canine retraction rate with self-ligating brackets vs conventional edgewise brackets

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Abstract

Objective: To compare the rates of retraction down an archwire of maxillary canine teeth when bracketed with a self-ligating bracket was used on one side and a conventional bracket on the other.

Materials and Methods: In 43 patients requiring maxillary premolar extraction, a self-ligating bracket (Damon3, SmartClip) was used on the maxillary canine on one side and a conventional bracket (Victory Series) on the other. The teeth were retracted down a 0.018-inch stainless steel archwire, using a medium Sentalloy retraction spring (150 g). The rates of retraction were analyzed using a paired *t*-test.

Results: The mean movement per 28 days for the conventional bracket was 1.17 mm. For the Damon bracket it was 0.9 mm and for the SmartClip bracket it was 1.10 mm. The differences between the conventional and self-ligating brackets were statistically significant: paired *t*-test, SmartClip, $P < .0043$; Damon3, $P < .0001$.

Conclusion: The retraction rate is faster with the conventional bracket, probably because of the narrower bracket width of the self-ligating brackets.

X. <http://www.angle.org/doi/abs/10.2319/081009-454.1>

Article Citation:

Padhraig S. Fleming and Ama Johal (2010) Self-Ligating Brackets in Orthodontics. *The Angle Orthodontist*: May 2010, Vol. 80, No. 3, pp. 575-584.

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Review Article

Self-Ligating Brackets in Orthodontics

A Systematic Review

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Abstract

Objective: To evaluate the clinical differences in relation to the use of self-ligating brackets in orthodontics.

Materials and Methods: Electronic databases were searched; no restrictions relating to publication status or language of publication were applied. Randomized controlled trials (RCTs) and controlled clinical trials (CCTs) investigating the influence of bracket type on alignment efficiency, subjective pain experience, bond failure rate, arch dimensional changes, rate of orthodontic space closure, periodontal outcomes, and root resorption were selected. Both authors were involved in study selection, validity assessment, and data extraction. Disagreements were resolved by discussion.

Results: Six RCTs and 11 CCTs were identified. Meta-analysis of the influence of bracket type on subjective pain experience failed to demonstrate a significant advantage for either type of appliance. Statistical analysis of other outcomes was unfeasible because of inadequate methodological design and heterogenous designs.

Conclusions: At this stage there is insufficient high-quality evidence to support the use of self-ligating fixed orthodontic appliances over conventional appliance systems or vice versa

XI. <http://www.angle.org/doi/abs/10.2319/121007-579.1>

Article Citation:

P. S. Fleming, A. T. DiBiase, G. Sarri, and R. T. Lee (2009) Pain Experience during Initial Alignment with a Self-Ligating and a Conventional Fixed Orthodontic Appliance System. *The Angle Orthodontist*: January 2009, Vol. 79, No. 1, pp. 46-50.

doi: <http://dx.doi.org/10.2319/121007-579.1>

Original Articles

Pain Experience during Initial Alignment with a Self-Ligating and a Conventional Fixed Orthodontic Appliance System

A Randomized Controlled Clinical Trial

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Abstract

Objectives: To test the hypotheses that (1) there is no difference in the pain experience during the week following initial placement of two orthodontic appliances (SmartClip™ and Victory™; 3M Unitek, Monrovia, Calif); and (2) there is no difference in the pain experience during removal and insertion of orthodontic archwires with these brackets.

Materials and Methods: Sixty-six consecutive patients were treated with a self-ligating bracket system (SmartClip™) or a conventional appliance (Victory™) on the basis of computer-generated random allocation. After appliance placement and engagement of a 0.016" nickel-titanium archwire, pain experience was recorded after 4, 24, and 72 hours and after 7 days with the use of a visual analog system (VAS) questionnaire. At a subsequent visit, participants documented pain experiences during removal and insertion of 0.019 × 0.025" archwires on an additional 100 mm VAS questionnaire. Independent *t*-tests and analyses of covariance were used to analyze normally distributed data; the Mann-Whitney *U*-test was used for skewed distributions.

Results: Forty-eight (72.2%) and fifty-one (77.3%) subjects completed the first and second parts of the study, respectively. Bracket type had no influence on pain experience at 4 hours ($P = .958$), 24 hours ($P = .289$), 72 hours ($P = .569$), and 7 days ($P = .756$) following appliance placement. However, bracket type significantly influenced pain experience during archwire removal ($P = .001$) and insertion ($P = .013$).

Conclusions: Hypothesis 1 cannot be rejected. The bracket type had no effect on subjective pain experience during the first week after initial placement of two preadjusted orthodontic appliances. Hypothesis 2 was rejected. Significantly greater discomfort was experienced during archwire insertion and removal with the SmartClip™ appliance.