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Comparative Assessment of EN - MASSE Retraction and Amount of Anchorage Loss in Damon Q and MBT Brackets: A Clinical Study

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ABSTRACT

Background: Frictional forces generated between bracket and arch wire have a significant effect on tooth movement. Conventional ligated brackets incur increased levels of frictional resistance via the elastomeric attachment between bracket and arch wire. Self-ligation eliminates the requirement for an elastomeric attachment and is associated with considerably reduced friction with different arch wires.

Materials and Methods: The first group (Group A) consisted of 10 patients who had undergone treatment with Ormco Damon Q Brackets. The second group (Group B) consisted of 10 patients who had undergone treatment with Conventional Brackets (MBT). The distances from the mesial aspect of the canine bracket to the distal aspect of the first molar bracket were recorded before (T1) and after space closure (T2), and an average rate of space closure per month was calculated.

Results: The overall rate of retraction using Damon Q Group and Conventional MBT Group were similar and there were no significant differences in the amount of anchorage loss.

Conclusion: With Ni-Ti coil springs with the wire sequence and bracket prescription used in this study, there was no difference in the rates of space closure and anchorage loss between Damon Q and conventional MBT brackets.

Keywords: Damon Q, Conventional MBT, Retraction, Anchor Loss.

INTRODUCTION

It is difficult to imagine that there was a period in Orthodontics before the invention of brackets. Yet this was the situation when Edward Hartley Angle developed and perfected treatment procedures with his "E" arch, which expanded the dental arches. During this time he also advocated the pretreatment extraction of teeth and devised methods to close extraction spaces sans brackets. Brackets had a modest beginning in the form of the Ribbon Arch bracket designed by Angle. The introduction of brackets saw a new era in Orthodontics. With time both the Orthodontist and the manufacturers started shouldering the responsibility to arrive at new bracket designs and bracket systems. The wave of design changes continued to mount with contributions from Angle, Steiner, Holdaway, Jaraback, Fizzell, Ricketts, tweed and many others, which led to the introduction of the standard Edge-wise bracket which was also called the Siamese or Twin Bracket. The total incorporation of in-out, tip and torque (1st, 2nd and 3rd order tooth movements) into the brackets was advocated by Andrews who developed the so-called

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straight wire appliance. This appliance has become so popular that people started referring to all pre adjusted bracket systems as straight wire systems.

Self-ligating (SL) brackets are not new to Orthodontics; they have been resurging from the early 20th century. In the mid 1930s, the Russell attachment was an attempt to enhance clinical efficiency by reducing ligation time. Some early SL brackets were the Ormco Edgelok (1972), Forestadent Mobil-Lock (1980), Orec SPEED (1980), and "A" Company Activa (1986). The Damon self-ligating bracket (Ormco, Glendora, Calif) was developed as an integral component of a low-friction appliance. Damon SL in 1996, Damon 2 in 2000, Damon 3 in 2004, Damon 3MX in 2005 and Damon Q in 2009 were developed based on the theory "**Low Friction and Light Forces Produced More Biologically Stable Results**" by Dwight Damon in 1990's. It has been suggested that the low-level friction associated with this bracket encourages more rapid levelling and alignment, allowing longer appointment intervals and reducing overall treatment time. Damon Q brackets are more secure and more comfortable for the patient when opened and closed, immune to the effects of calculus accumulation. The brackets are smaller in all dimensions than their predecessors and space has been found for a horizontal as well as a vertical auxiliary slot.

The first phase of fixed appliance in orthodontic treatment is concerned with tooth alignment. The response of the periodontium to the applied orthodontic force provides the fundamental mechanism that allows tooth movement through alveolar bone. Although the biologic factors are largely outside the control of the Orthodontist, more direct influence can be achieved with the choice of bracket system and archwire. Frictional forces generated between bracket and archwire also have a significant effect on tooth movement. Friction is influenced by the physical characteristics of the archwire and bracket materials, and the method of attachment between archwire and bracket. Conventional ligated brackets incur increased levels of frictional resistance via the elastomeric attachment between bracket and archwire. To reduce unwanted friction, various self-ligating bracket systems have been developed.

Self-ligation eliminates the requirement for an elastomeric attachment and is associated with considerably reduced friction with different archwires. The Damon self-ligating bracket was developed as an integral component of a low-friction appliance. It has been suggested that the low-level friction associated with this bracket encourages more rapid leveling and alignment, allowing longer appointment intervals and reduced overall treatment time. The low-force and low-friction environment provided by the Damon appliance offers considerable advantages over those with conventional ligation. These include greater patient comfort during treatment, fewer visits to the Orthodontist, shorter overall treatment time, less need for extractions, and better outcomes in terms of both occlusal and facial esthetics.

Therefore, the purpose of this study was to evaluate and compare the duration of time taken for en-masse retraction using Damon Q brackets and MBT brackets and to evaluate the anchor loss in both the groups with two different bracket system. Dr. Robert Keim, editor of the *Journal of Clinical Orthodontics*, stated that the future of Orthodontics will focus on three areas: 3-dimensional (3D) imaging replacing 2-dimensional cephalometry, self-ligating brackets, and microimplants as endosseous anchorage (temporary anchorage device).

MATERIALS AND METHODS

Twenty (20) subjects were selected from patients reporting to the Department of Orthodontics and Dentofacial Orthopaedics, Coorg Institute of Dental Sciences, Virajpet, Coorg District, Karnataka.

Selection Technique: Study subjects comprised of those regular patients who reported to the department Orthodontics and Dentofacial Orthopaedics seeking treatment.. The twenty patients were divided equally into two groups, the 1st group (Group A) comprised of ten patients who were treated with the Damon Q Self Ligating Brackets and other ten in the 2nd group (Group B) who underwent treatment with Conventional Ligating Brackets (MBT).

Colour Plate – 1

Fig 1: Mission Dental USA - ezee etch-37.

Fig 2: Ortho Solo Universal Bond Enhancer- sds Ormco.

Fig 3: Ormco Enlight Light Cure Adhesive.

Colour Plate – 2

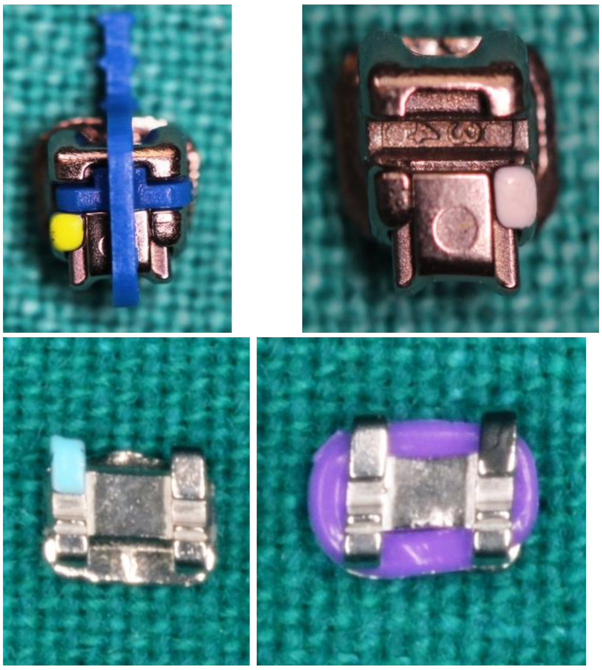


Fig 4: Damon Q Bracket and Conventional MBT Bracket.

Fig 5: 150mm Workzone Digital Caliper.

Fig 6: Damon Q Bracket Slot Opener.

Colour Plate – 3

Fig 7: Ligature Wire and 9mm (Libral Traders) Ni-Ti Coil Springs.

Fig 8: Orthopos XG 5 Ceph.

Colour Plate – 4

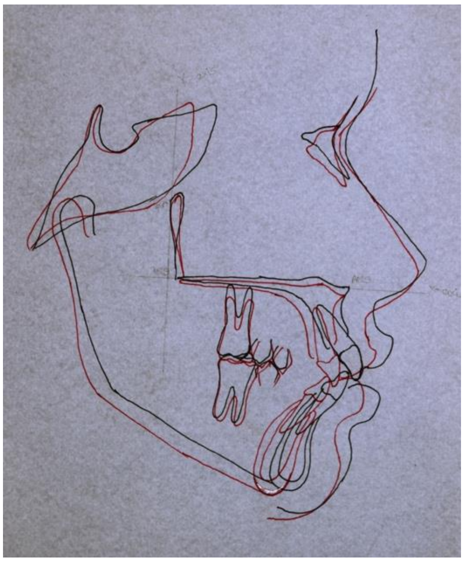


Fig 9: Ceph Superimposition to compare anchor loss.

Fig 10: Intra-oral measurement taken using 150mm Digital Caliper (Workzone).

Colour Plate 5

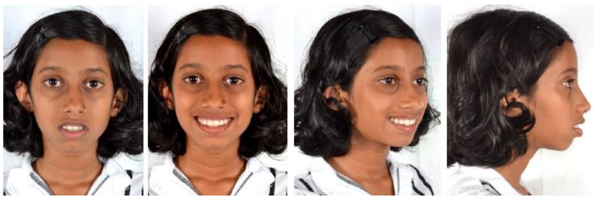


Fig 11: Pre Treatment Extra Oral Photographs (Damon Q).

Fig 12: Pre Treatment Intra Oral and Occlusal Photographs (Damon Q).

Colour Plate 6

Fig 13: Intra Oral and Occlusal Photographs Start Of Retraction (Damon Q).

Fig 14: Intra Oral and Occlusal Photographs End Of Retraction (Damon Q).

Colour Plate 7

Fig 15: Pre Treatment Extra Oral Photographs (Conventional MBT).

Fig 16: Pre Treatment Intra Oral and Occlusal Photographs (Conventional MBT).

Colour Plate 8

Fig 17: Intra Oral and Occlusal Photographs Start Of Retraction (Conventional MBT).

Fig 18: Intra Oral and Occlusal Photographs End Of Retraction (Conventional MBT).

Inclusion Criteria

1. Extraction of first premolar in atleast one arch.
2. No missing teeth other than third molars.
3. No asymmetric mechanics or asymmetric elastic wear during space closure.
4. Patients with Angle Class II molar and canine relationship or Angle Class I malocclusion with bialveolar dental protrusion, all permanent teeth erupted and good oral hygiene.
5. Use of conventional first molar anchorage
6. No previous history of orthodontic or orthognathic surgery.

Informed consent was taken from patients regarding the purpose, procedures, possible complications, and risk of the study.

Exclusion Criteria

1. Patients with second premolar extraction.
2. Missing permanent teeth (except third molars)
3. Periodontal bone loss and any medical condition or medication taken that could affect tooth movement.
4. Use of additional anchorage reinforcement (mini-implant, head gear, transpalatal arch, lingual arch, intermaxillary elastics, pendulum, twin block and Nance and any removable appliances during active treatment.
5. Patients with previous history of facial trauma.
6. Patients who skip their appointments.

Methodology

The study sample consisted of 20 subjects. The subjects were equally divided into two groups. The first group (Group A) consists of 10 patients who underwent treatment with Ormco Damon Q Brackets. The second group (Group B) consists of 10 patients who underwent treatment with Conventional Ligating Brackets (MBT).

EVALUATION OF EN – MASSE RETRACTION

After initial alignment & leveling, a 0.019*0.025-in SS archwire was placed with a soldered hook mesially to the canines and then left in place for 5 weeks. The 6 anterior teeth were consolidated with elastic stainless steel ligature wire, and the archwire end flush with the distal aspect of the first molar bracket on each side. After 5 weeks, 9-mm nickel- titanium (Ni-Ti) medium Sentalloy (150 g) coil springs (Libral Traders) were placed across the extraction sites from the molar buccal tube hook on the first molar; to the archwire hook mesial to the canine. The spring was activated between 6 and 9 mm and then ligated with an SS ligature The space between the mesial aspect of the canine bracket and the distal aspect of the first molar bracket was measured intraorally by using a digital caliper (150 mm WorkZone Digital caliper) to the nearest 0.01mm.Three measurements were taken, and, if there was any discrepancy, the 2 closer were recorded and mean average was taken. The patients were recalled every 5 weeks, excess wire was clipped distal to the molar brackets, the springs were checked for 6 to 9 mm activation and the spaces was measured until one extraction space had closed. The difference between the initial and final measurements was calculated to give the total amount of space closure, and this was divided by the number of months to give the rate of space closure in millimeters per month.

EVALUATION OF AMOUNT OF ANCHORAGE LOSS

Lateral cephalometric radiographs were taken for all patients before starting retraction (T1) and when space closure was completed (T2). Lateral cephalograms of the groups were standardized to a 1.25% magnification factor. The T1 and T2 lateral cephalograms for all patients were traced. The cephalograms were manually traced and superimposed on the maxilla. Maxillary bone, upper first molar (U6), upper central incisor (U1), and pterygomaxillary fissure (PTM) were traced on both cephalometric radiographs. Two references axes were constructed, and nine variables were identified. The first axis, or X axis, connected the anterior nasal spine (ANS) to the posterior nasal spine (PNS). The second axis (Y axis) was perpendicular to the X axis and tangent to the posterior border of the pterygomaxillary fissure, creating an X-Y coordinate system that was transferred for reference to the T2 tracing. The T1 and T2 superimposition was done over the incisive canal and posterior palatal plane. The U6 landmark represented the mesial contact point of the maxillary first molar. The other variables represented self-defined distances or angles to the coordinate system.

Statistical Methods Applied

- **Method of Study**: Comparative study.
- **Sampling Technique**: Purposive Sampling.
- **Statistical Analysis**: Descriptive Statistics. Paired and Independent sample ‘t’ test.

RESULTS

A total of 20 patients who reported to the Department of orthodontics and dentofacial orthopaedics seeking treatment for their dentofacial deformity were enrolled for the study. The twenty patients were divided into two groups. The first group comprised of ten patients who were treated with the Damon Q Self Ligating Brackets and the other ten in the second group were treated with the Conventional MBT Brackets. These patients were explained about the protocol, its advantages and limitations of the procedures and written consent was obtained from them before starting the treatment.

Comparison of Time Taken for Retraction

The total time duration taken for retraction from the day retraction started in both Group 1 and Group 2, till the day when one extraction space was closed were compared. The total time duration taken for treatment in Damon Q group was 248.50 (±14.07) days and for conventional group was 240.75 (±11.19) days. The comparison of time taken for retraction between the two groups shows that there was no significant difference between both groups.

Table 1: Comparison of Mean Cephalometric Differences (Retraction and Anchorage loss) with in Damon Q before and after treatment

Clinical parameters	Duration	Mean	Std. Deviation	Paired t value	P value and significance
RETRACTION IN MM	Before Treatment	10.62	2.18	8.857	<0.001
	After Treatment	4.51	0.57		

U6 - Y	Before Treatment	23.00	0.81	7.667	<0.001
	After Treatment	25.30	0.67		
U6 - X	Before Treatment	21.90	0.87	6.708	<0.001
	After Treatment	22.90	0.99		
U6 - X Degree	Before Treatment	85.00	1.76	6.866	<0.001
	After Treatment	87.30	1.25		
U1 - Y	Before Treatment	55.70	1.15	11.759	<0.001
	After Treatment	50.50	1.58		
U1 - X	Before Treatment	28.80	0.63	6.708	<0.001
	After Treatment	29.80	0.78		
U1 - X Degree	Before Treatment	123.80	3.70	5.056	0.001
	After Treatment	112.60	6.39		

p<0.05, HS - Highly Significant

Table 2: Comparison of Mean Cephalometric Differences (Retraction and Anchorage loss) with in MBT before and after treatment

Clinical parameters	Duration	Mean	Std. Deviation	Paired t value	P value and significance
RETRACTION IN MM	Before Treatment	10.77	2.05	11.446	<0.001
	After Treatment	4.51	0.63		
U6 - Y	Before Treatment	23.20	1.39	10.854	<0.001
	After Treatment	25.60	1.42		
U6 - X	Before Treatment	22.30	0.94	6.128	<0.001
	After Treatment	23.40	1.26		
U6 - X Degree	Before Treatment	84.60	1.64	6.692	<0.001
	After Treatment	87.50	1.08		
U1 - Y	Before Treatment	55.50	1.26	9.165	<0.001
	After	50.20	1.31		

	Treatment				
U1 - X	Before Treatment	28.80	0.63	4.583	0.001
	After Treatment	29.50	0.84		
U1 - X Degree	Before Treatment	123.00	3.16	4.842	0.001
	After Treatment	111.80	6.82		

p<0.05, HS - Highly Significant

Table 3: Comparison of Mean Cephalometric Differences between Damon Q and MBT before treatment

Clinical parameters	Groups	Mean	Std. Deviation	t value	P value and significance
Retraction	Damon Q	10.62	2.18	0.166	0.870 NS
	MBT	10.77	2.05		
U6 - Y	Damon Q	23.00	0.81	0.391	0.701 NS
	MBT	23.20	1.39		
U6 - X	Damon Q	21.90	0.87	0.980	0.340 NS
	MBT	22.30	0.94		
U6 - X Degree	Damon Q	85.00	1.76	0.524	0.607 NS
	MBT	84.60	1.64		
U1 - Y	Damon Q	55.70	1.15	0.368	0.717 NS
	MBT	55.50	1.26		
U1 - X	Damon Q	28.80	0.63	0.000	1.000 NS
	MBT	28.80	0.63		
U1 - X Degree	Damon Q	123.80	3.70	0.519	0.610 NS
	MBT	123.00	3.16		

p>0.05, NS – Non Significant

Interpretation: The overall rate of retraction & anchor loss was measured from the difference in the measurements taken at T1 and T2, divided by the number of days between the 2 measurements. This comparison was done between two groups with similar malocclusion.

Table 4: Comparison of Mean Cephalometric Differences between Damon Q and MBT after treatment

Clinical parameters	Groups	Mean	Std. Deviation	t value	P value and significance
RETRACTION IN MM	Damon Q	4.51	0.57	0.011	0.991 NS
	MBT	4.51	0.63		
U6 - Y	Damon Q	25.30	0.67	0.600	0.556 NS
	MBT	25.60	1.42		
U6 - X	Damon Q	22.90	0.99	0.983	0.339 NS
	MBT	23.40	1.26		
U6 - X Degree	Damon Q	87.30	1.25	0.383	0.707 NS
	MBT	87.50	1.08		
U1 - Y	Damon Q	50.50	1.58	0.461	0.650 NS
	MBT	50.20	1.31		
U1 - X	Damon Q	29.80	0.78	0.818	0.424 NS
	MBT	29.50	0.84		

U1 - X Degree	Damon Q	112.60	6.39	0.270	0.790 NS
	MBT	111.80	6.82		

p>0.05, NS – Non Significant

Graph 1 : Comparison of Mean Cephalometric Differences between Damon Q and MBT after treatment

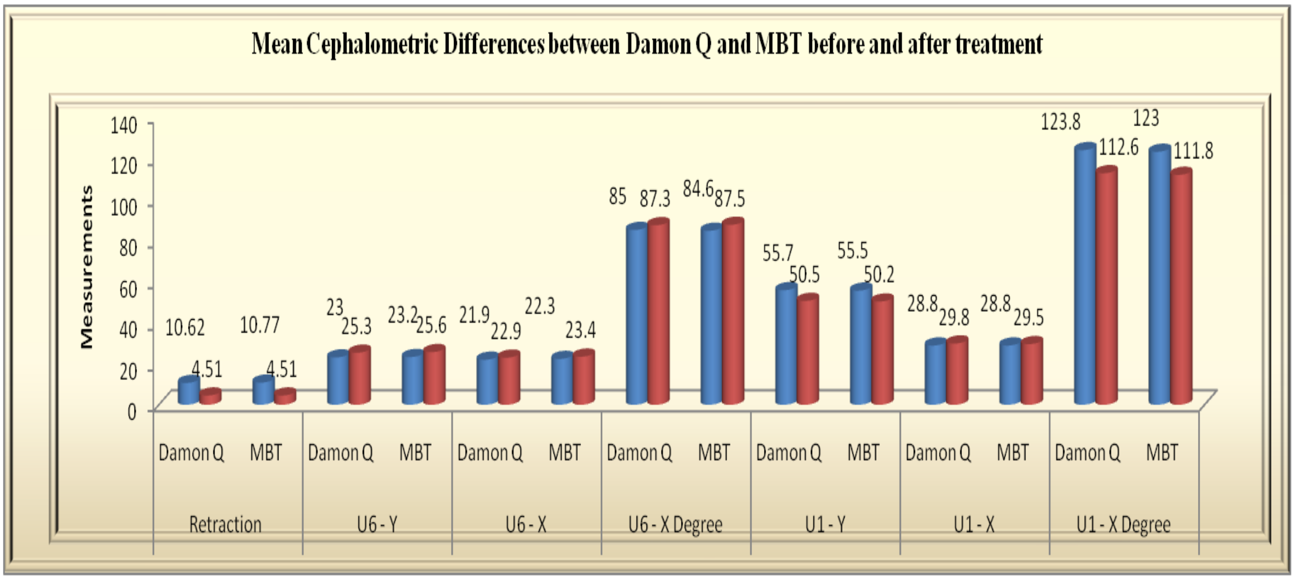


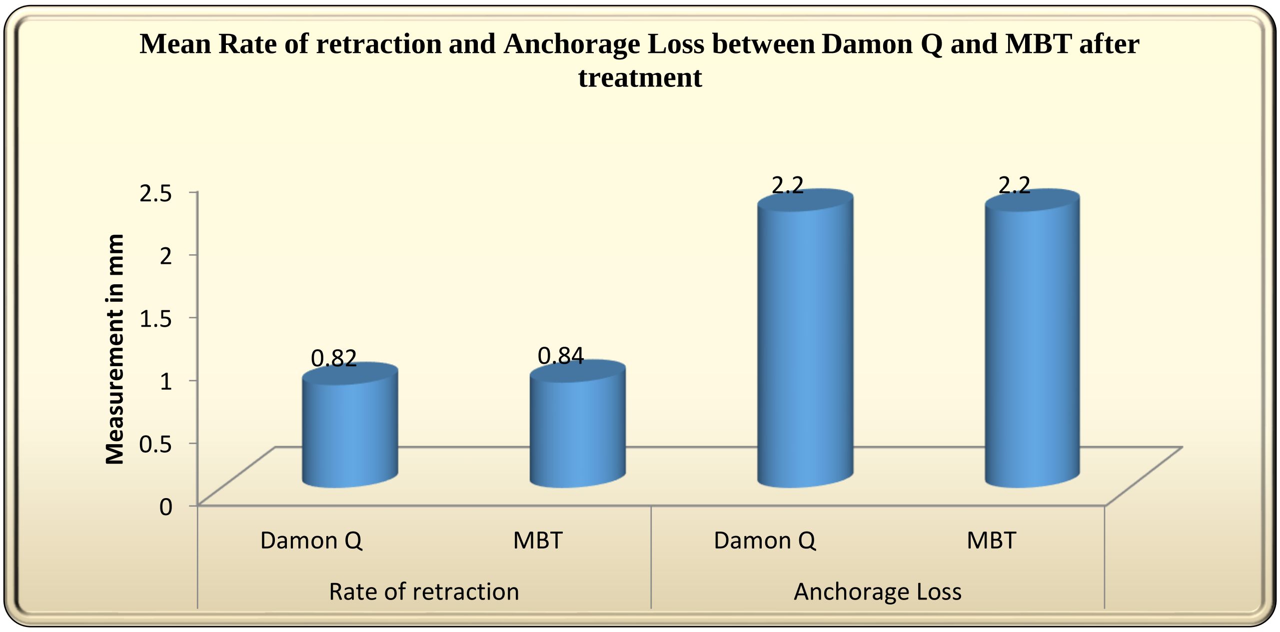
Table 5: Comparison of rate of Retraction and Anchorage loss between Damon Q and MBT after treatment

Clinical parameters	Groups	Mean	Std. Deviation	t value	P value and significance
Rate of retraction	Damon Q	0.82	0.07	0.181	0.606 NS
	MBT	0.84	0.13		
Anchorage Loss	Damon Q	2.20	0.91	0.087	1.000 NS
	MBT	2.20	0.42		

p>0.05, NS – Non-Significant

Interpretation: The mean for Overall rate of retraction for Damon was 0.82(±0.07) and for conventional.0.84(±0.13), there was no significant difference between Damon and Conventional in rate of retraction. The mean for Overall anchor loss for Damon was 2.20(±0.91) and for conventional 2.20(0.42), there was no significant difference between anchor loss between Damon and Conventional in Anchor loss.

Graph **2**: Comparison of rate of Retraction and Anchorage loss between Damon Q and MBT after treatment.



DISCUSSION

The concept of self-ligation is as old as that of the edgewise brackets. **S**elf-ligating brackets were introduced in this specialty in its first form some decades ago. Nonetheless, in the past 2 decades, there has been a boost in the manufacturing and release of self-ligating appliances with active or passive ligation modes. The basic advantages of these brackets involve the elimination of certain utilities or materials such as elastomeric modules along with the process or tools associated with their application. Efficiency of treatment mechanics is a major focus in modern orthodontics. During orthodontic tooth movement with the pre-adjusted edgewise system, friction generated at the bracket/archwire interface may impede the desired movement. Self-Ligating (SL) brackets are promoted on the premise that elimination of ligatures creates a friction-reduced environment and allows for better sliding mechanics, which would reduce the overall treatment time.

The first phase of fixed appliance orthodontic treatment is concerned with tooth alignment, with the effectiveness of this process dependent on several variables. Clearly, the underlying tissue biology will play a significant role; the response of the periodontium to the applied orthodontic force provides the fundamental mechanism that allows tooth movement through alveolar bone. Tissue vitality, cellular and connective tissue response, and periodontal health all contribute to the success of orthodontic tooth movement. Although these biologic factors are largely outside the control of the orthodontist, more direct influence can be achieved with the choice of bracket system and archwire

Frictional forces generated between bracket and archwire also have a significant effect on tooth movement. Friction is influenced by the physical characteristics of the archwire and bracket materials, and the method of attachment between archwire and bracket. Conventional ligated edgewise brackets incur increased levels of frictional resistance via the elastomeric attachment between bracket and archwire. To reduce unwanted friction, various self-ligating bracket systems have been developed. Self-ligation eliminates the requirement for an elastomeric attachment and is associated with considerably reduced friction with different archwires. Self-ligating brackets may also offer more certain archwire engagement, a requirement for less chair-side assistance and faster archwire removal and ligation. Significantly, an overall reduction in treatment time has been associated with these appliances

Damon system (Ormco, Glendora, Calif), which advocates a treatment philosophy based on the use of a passive self-ligated bracket design and super-elastic nickel-titanium archwires. According to this system, the low-force and low-friction environment provided by the Damon appliance offers considerable advantages over those with conventional ligation. These include greater patient comfort during treatment, fewer visits to the orthodontist, shorter overall treatment times, less need for extractions, and better outcomes in terms of both occlusal and facial esthetics. The purpose of this study was to compare rate of retraction & anchor loss between Damon Q and MBT brackets.

The study sample consisted of 20 subjects. The subjects were equally divided into two groups. The first group (Group A) consists of 10 patients who underwent treatment with Ormco Damon Q Brackets. The second group (Group B) consists of 10 patients who underwent treatment with Conventional Ligating Brackets (MBT).

EVALUATION OF EN – MASSE RETRACTION

The mean for Overall rate of retraction for Damon was 0.82(±0.07) and for conventional.0.84(±0.13), there was no significant difference between Damon and Conventional in rate of retraction. The total time duration taken for retraction from the day retraction started in both Group 1 and Group 2, till the day when one extraction space was closed were compared. The total time duration taken for treatment in Damon Q group was 248.50 (±14.07) days and for conventional group was 240.75 (±11.19) days. The comparison of time taken for retraction between the two groups shows that there was no significant difference between both groups.

Very Low friction with self-ligating brackets has been demonstrated clearly and quantified in work by various authors. It is assumed, therefore, that low friction in vitro, is associated with more rapid space closure and reduced treatment time in vivo. The results of this study demonstrate that the time required to complete orthodontic treatment is not significantly different between Damon Q brackets and the conventional MBT brackets tied with stainless steel ligatures.

Clinicians can therefore use their preferred bracket type (conventional or self-ligating) without it affecting the rate of space closure in extraction patients. SS ligatures were tied normally with no attempt to keep them loose, so this would seem to offer no advantage during en-masse space closure when the teeth are already levelled and aligned. However, if a different method were used such as modules or a chain tied around the bracket, the higher resistance to sliding might impact the rate of space closure.

Moreover, duration is likely to be governed by the skill, experience and objectives of the treating clinician, in addition to the dictates of the patient's malocclusion.

EVALUATION OF AMOUNT OF ANCHORAGE LOSS

The mean for Overall anchor loss for Damon was 2.20(±0.91) and for conventional 2.20(0.42), there was no significant difference between anchor loss between Damon and Conventional in Anchor loss. A premolar extraction in orthodontics is a treatment alternative geared primarily to resolve moderate to severe crowding and anterior tooth protrusion. Often the goal of space closure is to retract the maxillary anterior teeth while maintaining anchorage in the posterior teeth.

Anchorage conservation is among the said advantages of self-ligating brackets over conventional brackets. Friction reduction during sliding mechanics is supposed to reduce the force needed to move teeth during orthodontic treatment, which in turn lowers the reciprocal force on anchor tooth unit. This phenomenon is expected to improve anchorage and favour physiologic tooth movement, which may produce more stable treatment outcome. Although there was significant mesial movement of first molars in both Damon Q and conventional MBT brackets in this study, the loss of anchorage between the two groups was not significantly different.

The evidence has thus far been unable to prove enhanced performance of Self-ligating brackets as it relates to efficiency of tooth movement in space closure. This study also demonstrates that molar anchorage loss is similar regardless of the bracket system used. Biomechanical adjuncts to space closure, such as intrusion or gable bends, maybe more important than the type of ligation method in anchorage preservation.

Comparison with other studies

Our study is in agreement with the study conducted by Machibya, Bao, Zhao. They did a study to compare the treatment time, outcome, and anchorage loss of self-ligating and conventional brackets. The results showed that the mean treatment time for Self-ligating brackets did not show a statistically significant difference from months of conventional brackets. The study concluded that there was no difference in anchorage loss between the Self-ligating & conventional bracket groups. The treatment time and anchorage loss are not influenced by the type of bracket used.[3]

Our study is in agreement with the study done by Mezomo et al. They conducted a study to compare the Maxillary canine retraction with self-ligating and conventional brackets. The study included 15 patients who required maxillary canine retraction into first premolar extraction sites.In a random split-mouth design, the retraction was performed using an elastomeric chain with 150g of force. The evaluations were performed in dental casts (T0,initial; T1,4weeks;T2;8weeks,T3;12weeks). The amount of movement and the rotation of the canines as well as anchorage loss of the upper molars were evaluated. The study concluded that distal movement of the upper canines and anchorage loss of the first molars were similar with both conventional and self-ligating brackets.[6]

Peter G Miles conducted a study which was designed to compare en-masse space closure between Self-ligating and conventional twin brackets with sliding mechanics. The study consisted of 19 patients who had first premolar extractions in at least 1 arch, with second premolar and first molar distal to the extraction site bonded with Smartclip brackets on 1 side and conventional twin brackets on the other. Space closure was achieved on 0.016*0.022-in stainless steel wires with nickel- titanium coil springs activated 6 to 9 mm. The distance from mesial aspect of the canine bracket to the distal aspect of the first molar bracket was recorded before and after space closure and an average rate of space closure per month was calculated. The study concluded that not much significant difference was found in the rate of en-masse space closure between Smartclip brackets and conventional twin brackets.[4]

Our study is in strong agreement with the study conducted by Marcio de Almeida et al who compared anchorage control between conventional brackets and self-ligating brackets. The study consisted of 38 patients who were divided into two groups. Group 1 comprising of 23 patients, bonded with preadjusted conventional brackets. Group 2 compromising of 15 patients, bonded with preadjusted self-ligating brackets. Patients in both groups received a nickel titanium (NiTi) intrusion arch and a 150 g NiTi closing coil spring for separate canine retraction, followed by a continuous mushroom loop archwire to retract the incisors. Lateral cephalograms were available at the start of treatment (t1) and at the completion of space closure (t2). Statistical comparisons were performed with paired and unpaired student's t-tests. The study concluded that there was not much difference in the amount of anchorage loss of the maxillary first molars between Self ligating bracket and Conventional bracket systems.[5]

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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