

Damon system-the beauty of arch development

¹Athul SB, MDS, Department of Orthodontics Kannur Dental College, Kannur, Kerala

²Arun Kumar G, MDS, Prof and HOD, Department of Orthodontics, Sharavathi Dental College and Hospital, Shimoga, Karnataka

³Ramesh. G. C, MDS, Prof, Department of Orthodontics, Sharavathi Dental College and Hospital, Shimoga, Karnataka.

⁴Ganesh Chinthan. C, MDS, Reader, Department of Orthodontics, Sharavathi Dental College and Hospital, Shimoga, Karnataka.

⁵Greeshma Kannan M, MDS, Department of Orthodontics, Srinivas Dental College and Hospital, Mangalore, Karnataka

⁶Sachin Bharadwaj, MDS, Department of Orthodontics, Sharavathi Dental College and Hospital, Shimoga, Karnataka

Corresponding Author: Athul SB, MDS, Department of Orthodontics Kannur Dental College, Kannur, Kerala

How to citation this article: Athul SB, Arun Kumar G, Ramesh. G. C, Ganesh Chinthan. C, Greeshma Kannan M, Sachin Bharadwaj, “Damon system-the beauty of arch development”, IJMACR- May – June - 2021, Vol – 4, Issue -3, P. No. 187 – 191.

Copyright: © 2021, Athul SB, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License 4.0. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Orthodontic science always strived hard to deliver the best possible, both the patient and practicing Orthodontist. PEA helped us to move the teeth more predictably, but certain drawbacks associated with conventional ‘ligation’ slow down the phase considerably.

Following the introduction of Damon system brackets, it was claimed that by using this system, the patient would benefit by improved facial aesthetics. It provides a well-documented means, a virtually friction-free tube, by which the most advanced wire technologies can work to their maximum advantage, an aim most of us have aspired to but have not been able to achieve in conventionally ligated edgewise systems.

According to proponents of the Damon system brackets, considerable expansion can be achieved in the buccal

segments, producing a broader arch form (with reduced buccal corridors) that is more in balance with the tongue and cheeks.

Keywords: Beauty, friction, orthodontist, PEA, cheeks, tongue.

Introduction

A revolutionary change in the history of brackets was the introduction of the self-ligating brackets. Self-ligating brackets are supposed to be advantageous in that they provide greater patient comfort, reduced friction between bracket and archwire, shortened treatment time and reduced chair time.¹¹ They offer more precise control of tooth translation, ¹² reduced overall anchorage demands, rapid alignment and more certain space closure.¹³ There is reduced incidence of soft-tissue lacerations, improved

oral hygiene, 14 less chance of cross infection risk and better esthetics.¹³

Following the introduction of the Damon System by Dr. Dwight Damon, it was claimed that the patient would benefit by improved facial esthetics. It provides a well-documented means, a virtually friction-free tube, by which the most advanced wire technologies can work to their maximum advantage; an aim most of us have aspired to, but have not been able to achieve in conventionally ligated edgewise systems.

In all types of treatment, the widths of the arches increase during alignment with or without extractions. The greater changes occur in the area of premolars, followed by the area of canines and, finally, in the region of molars [3]. The use of low-friction brackets such as the Damon System, associated with wires of lighter forces produces a greater expansion in the posterior region of the arch, with less alteration in the intercanine distance and position of the mandibular incisor than the conventional appliances [4, 5].

Dr. Dwight Damon argues that he creates a functional adaptation similar to the Frankel effect with very light wires in his friction-free appliance and that tipping the balance of forces in a positive direction, thereby reestablishing a functional balance which allows the alveolar process to create a new arch form specific for each individual. Dr. Dwight Damon sees this as *adaptation* rather than *expansion*. The difference is that in using light forces to facilitate adaptation, you're not creating an artificially preset arch form with rigid wires or other high-force means such as expanders.

Our intension here is to compare the change in basal arch width in class I non extraction case using Damon System in pretreatment and post levelling and aligning stage.

Methodology

Patients who were undergoing orthodontic treatment with Damon System (Ormco, Orange, Calif) in the Department of Orthodontics and Dentofacial Orthopedics, Sharavathi Dental College and Hospital, Shimoga, Karnataka were selected for this comparison study. Individuals selected should have complete permanent denture to first molars, Class I malocclusion, slight to moderate crowding, and non-extraction in the treatment plan. Class II and III malocclusions and complex cases were excluded from the sample.

Patients were treated with the self-ligating Damon System. The wires used were 0.014 (CuNiTi), 0.014 x 0.025 (CuNiTi), 0.018 x 0.025 (CuNiTi).

In the initial and post levelling and alignment dental casts of each case, the following variables were evaluated: intercanine distance, interpremolar distance between Ist premolars and intermolar distances between Ist molars (Fig.1).

A metallic scale with reading of 150mm was used to analyse the dental casts for comparison of inter canine width, inter first premolar width and inter first molar width, before the treatment and after levelling and alignment.

After measuring the variables in the maxillary (Fig.2) and mandibular (Fig.3) dental casts, the values in the initial and post levelling and alignment stages were compared.

Result

On comparison with pre-treatment model, maxillary intercanine distance increased by 3.5mm, interpremolar distance increased by 7mm and intermolar distance increased by 2mm. Whereas mandibular intercanine distance increased by 3mm, interpremolar distance increased by 6mm and intermolar distance increased by 3mm.

Discussion

The results found in the present study must be considered only for Class I cases with slight to moderate crowding.

The largest increase in the maxillary arch with the Damon appliance develops the bone density of the maxilla, thus allowing a greater expansion of the dental arch, when they are known as expanded thermo activated Cupper-Niti super elastic, as pre-conceived by this technique. In the mandibular arch, where the bone is denser, a larger expansion with the Damon appliance, not available in all regions of the arch, even with the use of wires above.(fig.4,5,6)

Dr. Dwight Damon argues that he creates a functional adaptation similar to the Frankel effect with very light wires in his friction-free appliance and that tipping the balance of forces in a positive direction (thereby reestablishing a functional balance) allows the alveolar process to create a new arch form specific for each individual.

The considerable adaptation you realize from the Damon System is due to the functional interplay among the light forces of the Ni-Ti wires, the tongue and the lips that causes the buccal teeth to move laterally in the path of least resistance. It's the path of least resistance because the lower lip is maintaining incisal position. In superimposing the arch from this fully aligned case onto its original arch at the canines, you see the lateral movement of the buccal teeth. The final lower incisor position will depend upon a number of factors, including the original axial inclination of the canines and the position of the tongue.

When planning an orthodontic treatment, the choice not only of the appliances, but of the wires which we are using along with the appliance. When a greater expansion of the arch and perhaps a protrusion of the mandibular incisors are desired, it is recommended to use the self-ligating

Damon System with Cupper-Niti expanded arches. When the expansion of the dental arches is contraindicated, or not desired, it is recommended to use the conventional appliances.

Conclusion

Comparing the pre-treatment and post levelling and alignment model, the self-ligating Damon appliances promoted a significantly larger increase of the transverse dimensions of the maxillary and mandibular arch.

There was evident increase in transverse width at the level of premolars, followed by the canines and molars respectively.

References

1. Damon DH. The rationale, evolution and clinical application of the self-ligating bracket. *Clin Orthod Res.* 1998 Aug;1(1):52-61
2. Damon DH. The Damon low-friction bracket: a biologically compatible straight-wire system. *J Clin Orthod* 1998;32:670-80.
3. Alan Pollard. Capturing the essence of the Damon approach. *Clinical Impressions* 2003; 12(2):4-11.
4. Damon D. Damon system: The Workbook. Orange, CA: Ormco; 2004.
5. Hime, D.L. & Owen III, A.H.: The stability of the arch-expansion effects of Frankel appliance therapy, *Am J Orthod Dentofacial Orthop.* 1990;98(5):437-445.
6. Damon D. Stability of the Damon System. *Clinical Impressions* 2005;16:16-18.
7. Damon DH: Treatment of the face with biocompatible orthodontics, in Graber TM, Vanarsdall RL, Vig KWL (eds): *Orthodontics: Current Principles and Techniques.* St Louis, Elsevier Mosby, 2005, pp 753-831.

Legend Figure

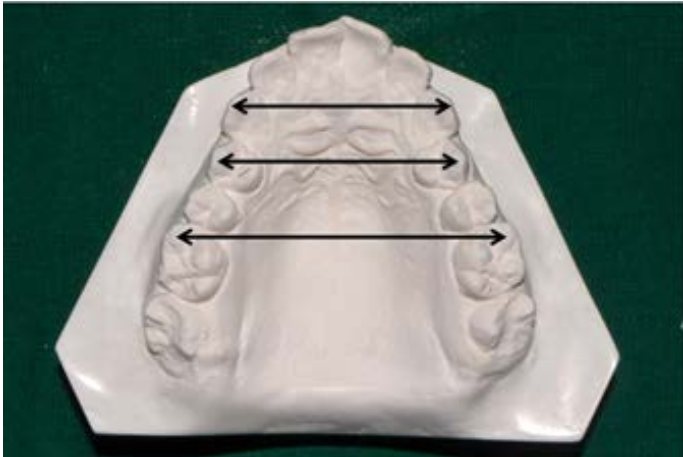


Figure 1

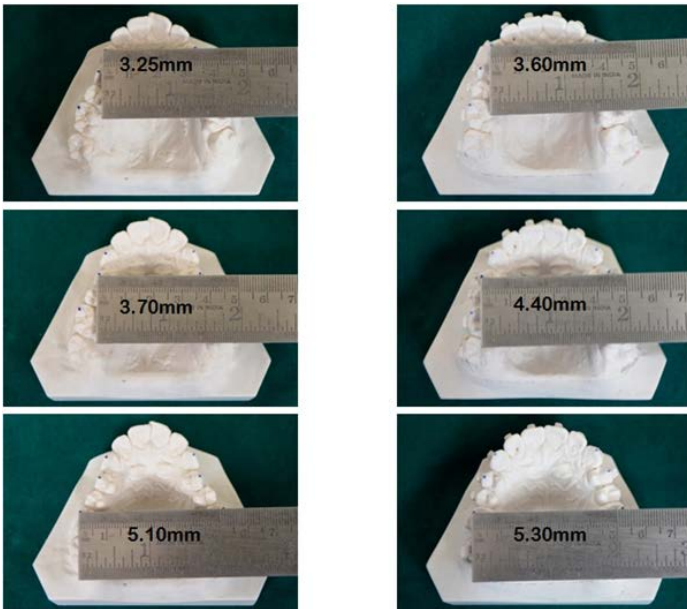


Figure 2

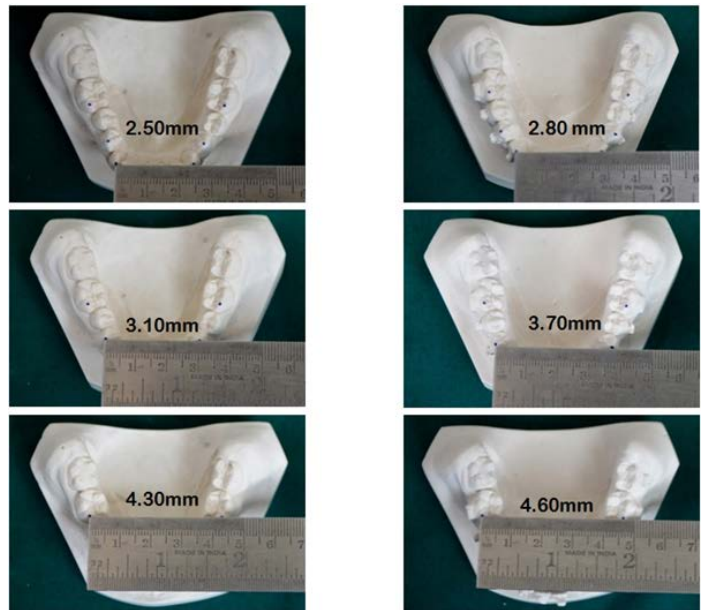


Figure 3



Figure 4: Pre treatment

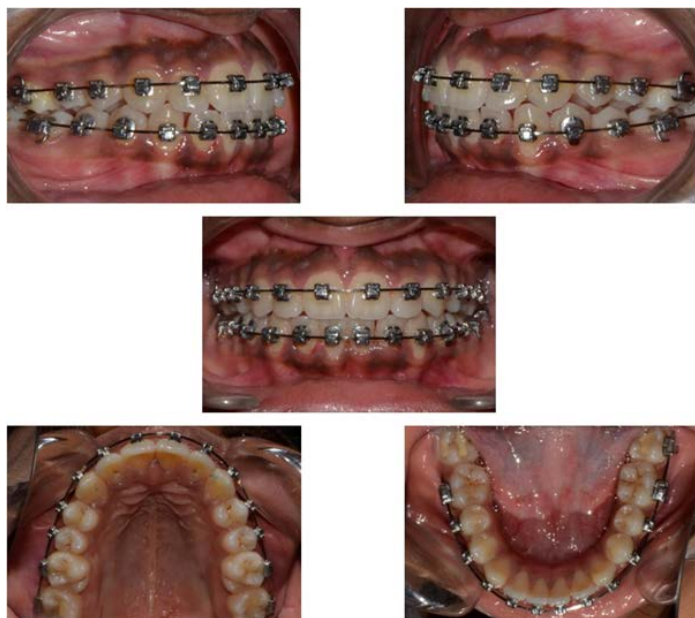


Figure 5: Mid treatment



Figure 6: Posttreatment