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Original Research

Comparative analysis of pendulum appliance (PA) and the distal screw appliance (DS) in Class II malocclusion patients

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ABSTRACT:
Background: Recent developments in mechanotherapy & changes in concepts have reduced the need for extraction in several types of discrepancies. The present study compared pendulum appliance (PA) and the distal screw appliance (DS) in Class II patients. **Materials & Methods:** The present study was conducted on 92 patients of class II malocclusion of both genders. Patients were divided into 2 groups of 46 each. Group I patients were treated with the pendulum and group II patients were treated with distal screw appliance. The mean distalization time was assessed. Lateral cephalograms were obtained before treatment and at the end of distalization. **Results:** Out of 92 patients, males were 50 and females were 42. Group I patients were treated with the pendulum and group II patients were treated with distal screw appliance. Each group had 46 patients. The mean distalization time in group I was 7.2 months and I group II was 8.6 months. The difference was non- significant (P> 0.05).
Conclusion: Authors found that both pendulum appliance and distal screw appliance was equally effective in distalizing molar in class II malocclusion patients.
Key words: Class II malocclusion, Distal screw appliance, Pendulum appliance

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INTRODUCTION

In the adult patients there is no clinically significant growth in the bone structure; therefore, alternative solutions must be found to obtain space in which the teeth can be moved, to correct the malocclusion.[1] Edward Angle, the "father of modern orthodontics," set a non extraction tone to treatment. He believed that when teeth could be corrected by other modalities, extraction of teeth for orthodontic purpose seemed particularly.[2]

Recent developments in mechanotherapy & changes in concepts have reduced the need for extraction in several types of discrepancies. Management of borderline cases has always surmounted controversies. An estimated 25-30% of all orthodontic patients can be benefited from maxillary expansion, and 95% of class II cases can be improved by molar rotation, distalization & expansion.[3] With the recent trend towards more non extraction treatment, several appliances have been advocated to distalize molars in the upper arch. Certain principles, as outlined by Burstone must be borne in mind when designing such an appliance must have magnitude of forces, magnitude of moments, moment-to-force ratio, constancy of forces and moments, bracket friction (frictionless appliances are preferable) and ease of use.[4] The present study compared pendulum appliance

(PA) and the distal screw appliance (DS) in Class II patients.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics. It comprised of 92 patients of class II malocclusion of both genders. All patients were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 46 each. Group I patients were treated with the pendulum and group II patients were treated with distal screw appliance. The mean distalization time was assessed. Lateral cephalograms were obtained before treatment and at the end of distalization. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Total- 92		
Gender	**Males**	**Females**
Number	50	42

Table I, graph I shows that out of 92 patients, males were 50 and females were 42.

Table II: Distribution of patients in both groups

Groups	Group I	Group II
Appliance	Pendulum	Distal screw
Number	46	46

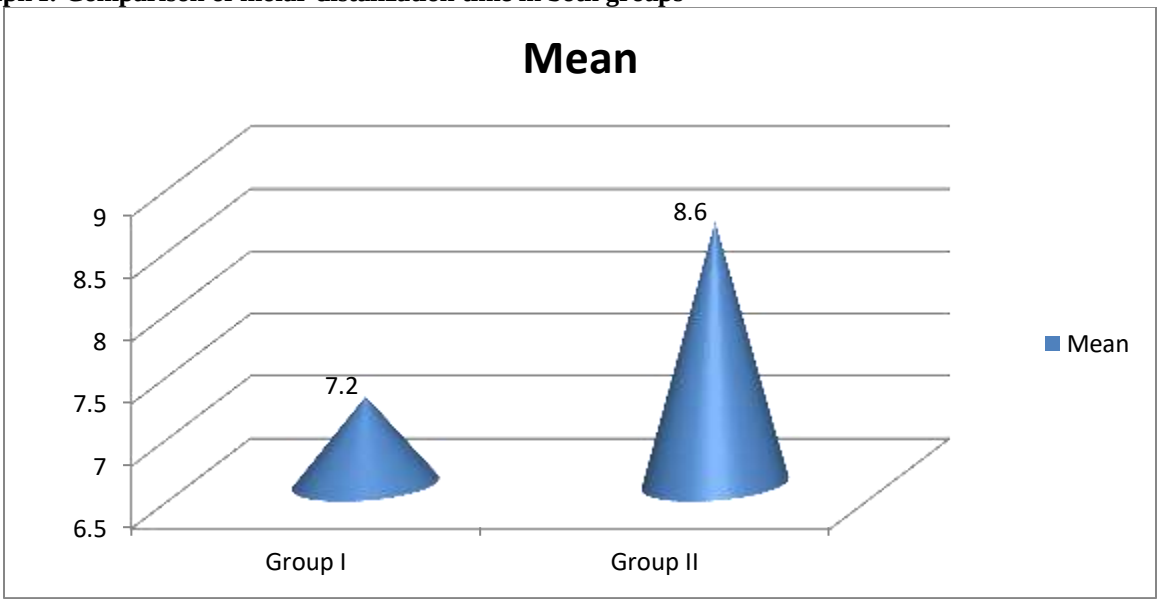
Table II shows that shows that group I patients were treated with the pendulum and group II patients were treated with distal screw appliance. Each group had 46 patients.

Table III Comparison of molar distalization time in both groups

Distalization time (months)	Group I	Group II	P value
Mean	7.2	8.6	0.08

Table III, graph I shows that mean distalization time in group I was 7.2 months and I group II was 8.6 months. The difference was non- significant (P> 0.05).

Graph I: Comparison of molar distalization time in both groups



DISCUSSION

Angle used traction headgear appliances to retract the maxillary molars in cases with Class II division 1 malocclusion.[5] Molar distalization is the term that is now used for lengthening the dental arch by posterior movement of the buccal segment teeth in order to provide space in the maxillary arch.[6] Distal movement of the maxillary molars is mainly used to correct a Class II molar relationship, to reduce a mild to moderately increased overjet or for treatment of midline deviation problems. As an interceptive measure, maxillary molar distalization can also provide space for spontaneous eruption of ectopic canines. This has been shown to have a success rate of 80% compared to 50% in a control group.[7]

In addition, molar distalization can be used to regain lost space caused by mesial migration of molars in premolar Mohammed Almuzian crowding cases and to upright maxillary first permanent molars when they are impacted against maxillary deciduous second molars.8,9 Limitations and contraindications Most distalization techniques result in loss of anchorage in the form of incisor proclination and are therefore contraindicated where the incisors are already proclined, where the overjet is increased, or for patients with a protrusive profile. Molar distalization should be avoided in cases with thin labial bone and gingival problems due to the risk of gingival recession.[8]The present study compared pendulum appliance (PA) and the distal screw appliance (DS) in Class II patients.

In this study, out of 92 patients, males were 50 and females were 42. Group I patients were treated with the pendulum and group II patients were treated with distal screw appliance. Each group had 46 patients.Chiu et al[9] conducted a study I which forty-three patients with Class II malocclusion were retrospectively selected for the study. Twenty-four patients (mean age, 12.2 ± 1.5 years) were treated with the PA, and 19 patients (mean age, 11.3 ± 1.9 years) were treated with the DS. The mean distalization time was 7 months for the PA group and 9 months for the DS group. PA and DS were equally effective in distalizing maxillary molars (4.7 mm and 4.2 mm, respectively) between T1 and T2; however, the maxillary first molars showed less distal tipping in the DS group than in the PA group (3.2o vs. 9.0o , respectively). Moreover, significant premolar anchorage loss (2.7 mm) and incisor proclination (5.0^o) were noted in the PA group, whereas premolar distal movement (1.9 mm) and no significant changes at the incisor (0.1^o) were observed in the DS group. No significant sagittal or vertical skeletal changes were detected between the two groups during the distalization phase.

We found that mean distalization time in group I was 7.2 months and I group II was 8.6 months. The pendulum device is one of the most commonly used conventional distalizing devices.1,2 However, despite its efficacy in molar distalization, premolar mesial movement and anterior anchorage loss continue to represent an unpleasant problem and require additional treatment time for correction during fixed appliance therapy. The distal jet appliance was modified into a skeletonized distal Jet appliance, in which the Nance button was eliminated but the arms on the premolar were retained; it was later modified into the distal screw appliance.[10]

CONCLUSION

Authors found that both pendulum appliance and distal screw appliance was equally effective in distalizing molar in class II malocclusion patients.

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