

Comparison between the treatments of anterior cross-bite with three different techniques in a group of Iraqi patients

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Abstract:

this study evaluated the effect of fixed orthodontic appliance treatment of anterior cross-bite having a removable posterior bite plate (removable appliance combined with fixed appliance) and fix orthodontic appliance treatment with composite light cure filling material on the occlusal surfaces of lower second premolars and first molars as block by etching and bonding the teeth, 24 patients were selected from the medical technical institute clinic in Baghdad from the first of January 2013 until the 30th of December 2013 complaining from anterior cross-bite one tooth or more age range (13-19) 11 male and 13 female subdivided into three groups depending on the type of treatment used, results showed that there are highly significant difference in treatment time in response to the group of patient with posterior composite etched block (<0.001) even though the displacement space results between groups showed a non significant difference, in conclusion fix orthodontic appliance with posterior composite etched block on premolars and molar teeth is the shortest and best treatment technique we can use for treating such conditions

Key words anterior cross bite, bite plate, fixed orthodontic appliance

Introduction

Bishara(1) defined normal occlusion as the way maxillary and mandibular teeth articulate, while Klinberg and Jagger(2) stated that occlusion is dynamic biological relationship of components of the masticator system that determine teeth relation.

Graber has defined cross-bite as a condition where one or more teeth may be abnormally malposed either lingually or labially with reference to opposing teeth(3). Anterior cross-bite is defined also as malocclusion resulting from the lingual positioning of the maxillary anterior teeth in relationship to the mandibular anterior teeth(4) anterior cross-bite is also defined as upper frontal primary or individual permanent teeth lingual position in relationship to the lower incisor teeth(5).

Anterior cross-bite may result from variety of factors such as lingual eruption path of maxillary anterior incisors, repaired cleft lip, trauma to the primary incisors resulting in a lingual displacement of the permanent tooth germ, supernumerary anterior teeth, an over retained necrotic or pulp less deciduous tooth or root, odontomas , crowding in the incisor region, inadequate arch length , biting habit of upper lip.(6-8)

Cross-bite is a major aesthetic and functional concern for the child and the adult as delay in treatment may become more complicated (9), patient with this problem complaint from poor esthetic, periodontal problems ,pain in the temporo mandibular joint , disturbance in eruption path of adjacent and opposing teeth.

The incidence of interior cross-bite has a strong ethnic distribution as 10% of Japanese population suffer from such a condition, Ferguson(10) also found 3% of the population suffer from this condition in the United States .there are several techniques for treatment of such a condition.

The aim of the study was to compare between three types of treatment techniques using fixed appliances of different type to **treat** cross-bite so that to determine what type of treatment was the best to get the most of it with shorter time and perfect job.

Subjects and methods:

Twenty four patients selected from the patients attending the medical technical institute clinic in Baghdad from the first of January 2013 until the 30th of December 2013 complaining from anterior cross-bite one tooth or more age range (13-19) 11 male and 13 female subdivided into three groups depending on the type of treatment used and as follows:

1-Group1: include 8 patients 4 males and 4 females with anterior cross-bite treated by ordinary fix orthodontic appliance (control) for the upper and lower jaws with the extraction of the upper and lower first premolars and retracted the canine posteriorly so that the anterior cross-bite teeth moved to the normal position, all the cases was class1 Angle's classification with crowded anterior teeth.

2-Group2: include another 8 patients 3 males and 5 females with anterior cross- bite treated by fix orthodontic appliance on the maxillary and mandibular teeth with the extraction of the upper and lower first premolars with incorporation of a removable posterior bite plate (removable appliance combined with fixed appliance) to enhance opening the cross-bite anteriorly to help correcting the problem, all the cases was class1 Angle's classification with crowded anterior teeth.

3-Group3: include 8 patients 4 males and 4 females with anterior cross-bite treated by ordinary fix orthodontic appliance for the upper and lower jaw with the extraction of the upper and lower first premolars, but the difference here is by applying composite light cure filling material on the occlusal surfaces of lower second premolars and first molars as block by etching and bonding the teeth to prevent patient closing in occlusion which lead to help in treatment, , all the cases was class1 Angle's classification with crowded anterior teeth.

The inferential statistical analysis methods used in this study were in order to asses and analysis the results include:-

1-T Test for the comparison between two means.

2-Analysis of variance (ANOVA) the least significant difference to compare between the three groups with least significant difference (LSD).

Results:

To the limit of this study results that is listed below showed that in (table 1) the mean of treatment time was significantly lower in group -2-(7.75 ± 0.65)than in group- 1-(8.94 ± 0.82) ($P=0.0064$).

Table(1):comparison between group 1 and group 2by t test

Parameters	GROUP1 (n=8) Mean \pm SD	GROUP2 (n=8) Mean \pm SD	P value
Treatment time (months)	8.94 \pm 0.82	7.75 \pm 0.65	0.0064
Displacement space (mm)	4.19 \pm 1.98	3.25 \pm 0.65	0.2244

While comparing between group 1 and group 3 by T test showed in (table2) the mean of treatment time was highly significant lower in group- 3 -(5.19±0.46)than in group- 1- (8.94±0.82)(P=0.001)

Table(2):comparison between group 1 and group 3by t test

Parameters	GROUP1 (n=8) Mean±SD	GROUP3 (n=8) Mean±SD	P value
Treatment time (months)	8.94±0.82	5.19±0.46	0.001
Displacement space (mm)	4.19±1.98	3.0±0.53	0.1239

Table (3)represent the comparison between group 2 and group 3 by T test and the results showed that the mean of treatment time was highly significant lower in group- 3-(5.19±0.46) than in group- 2- (7.75±0.65)(P=0.001)

Table(3):comparison between group 2 and group 3 by t test

Parameters	GROUP2 (n=8) Mean±SD	GROUP3 (n=8) Mean±SD	P value
Treatment time (months)	7.75±0.65	5.19±0.46	0.001
Displacement space (mm)	3.25±0.65	3.0±0.53	0.4168

By using ANOVA test comparing between means of the same variables in more than 2 groups (3 or more) was used to show the correlation in reducing the time of treatment within the 3 groups and this was evident as it appear in (table 4) as the mean treatment time was highly significant lower among three groups in favor to the third group as it was the minimum time needed for treatment of anterior cross bite.

Table (4): comparison between 3 groups by ANOVA test

Parameters	GROUP1 (n=8) Mean±SD	GROUP2 (n=8) Mean±SD	GROUP3 (n=8) Mean±SD	P Value
Treatment time (months)	8.94±0.82	7.75±0.65	5.19±0.46	0.001
Displacement space (mm)	4.19±1.98	3.25±0.65	3.0±0.53	0.1566

As shown in all tables the displacement space measured by millimeter correlation was non significant between groups.

Discussion:

Dental anterior cross-bite involving one tooth or more can be corrected by means of fix orthodontic appliance as the fix appliance ,having greater power of action and liberating more continuous forces when compared to removable ones ,reduces the need for patient cooperation and allows for three –dimensional control of the tooth to be moved(11) .

In this study results showed that in comparing between the groups ,group number three was having the best results in correspond to time interval of treatment as all eight patient take shorter time for correction of cross-bite than other two groups and that the treatment by fix appliances with composite block was superior in results in relation to decreasing time of treatment and this was in agreement with Skeyos & Sandler(12)who stated that the use of fix appliances

was correctly used for treatment of anterior cross-bite malocclusion and it is completed more rapidly than would have occurred with conventional removable technique and also agreed with Randel et al(13) who stated that the using of fix appliance will utilize light continuous force to correct the cross-bite.

Opening the bite posteriorly helped to enhance the treatment time for the third group of patient.

In concern to the distance moved by displacement of the teeth in mm, statistical analysis showed that type of treatment was not correlated to distance and there is no relation between type of treatment and time of treatment and all the results showed a non significant difference relation.

Conclusion:

In conclusion the treatment of anterior cross-bite with one tooth or more can be successfully treated by fix orthodontic appliance for the maxillary and mandibular jaw with the application of composite bite block on 65 56 to open the bite for shorter time than the two other techniques.

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