Original Article

Two Different Applications of Class II Elastics with Nonextraction Segmental Techniques

Aslihan Uzel[a]; Ilter Uzel[b]; M. Serdar Toroglu[c]

ABSTRACT

Objective: To evaluate the relative effects of Class II elastics applied directly with utility arches (UAs) or with the Reciprocal Mini–Chin Cup (RMCC) appliance.

Materials and Methods: Thirty patients with Class II division 1 malocclusion were included. Fifteen of them were treated with the RMCC appliance and the other 15 treated with Class II elastics on UAs. Lateral cephalograms of an additional 15 untreated persons having the same characteristics as the treatment groups were used as a control group.

Results: The mean control period was 10 months. Class I molar and canine relationships were achieved in a mean treatment time of 4.6 months with the RMCC appliance and in 8.5 months with the elastics on UAs. The amount of overjet reduction was 4.7 mm in the RMCC group (87.87% dental) and 5.2 mm in the UA group (80.76% dental). The molar correction was 4.5 mm in the RMCC group (87.36% dental) and 2.0 mm in the UA group (51.47% dental). The anterior lower facial height increased in both of the treatment groups.

Conclusions: The RMCC appliance is a valuable alternative for Class II elastic use in Class II cases in which the upper molars need to be moved to the distal more than the upper incisors.

KEY WORDS: Class II elastics; RMCC appliance; Segmental technique

INTRODUCTION

Class II elastics are auxiliary forces that can be classified as active elements in a fixed appliance system.[1] They have been used in the correction of Class II malocclusion since the early days of orthodontic treatment,[2–6] although some undesirable effects can occur, depending on their vertical force vectors.[4,6–10] The vertical force can extrude the mandibular molars and maxillary incisors, leading to the rotation of the occlusal plane, and may also adversely affect the smile line.[4,6,8,11]

Because the force vectors vary according to the area where they are applied, methods have been recommended to overcome the negative side effects.[6,7,12–16] It is been suggested that the position of the intermaxillary elastics should be located according to the differing clinical objectives.[17] Various timing and application methods have been proposed for different mandibular vertical growth patterns.[7,16] Short elastics have been recommended in order to prevent lower molar extrusion, and the use of segmental techniques has been recommended in order to prevent upper canine extrusion.[12,14,15]

Langlade[18] introduced the Reciprocal Mini–Chin Cup (RMCC) appliance in 1998 as an alternative method for dental Class II treatment. He claimed that it increases the effectiveness of Class II elastics while eliminating the adverse effects on the upper incisors in a very short treatment time. In this system, a Class II elastic force is applied directly to the upper molars instead of the upper incisors through the maxillary arch, and a parallel force vector is increased by using the chin as an anchorage unit. The RMCC can be fabricated in the laboratory and also is available in the market.[18]

Although numerous suggestions have been made about the application of Class II elastics, there are surprisingly few studies in the literature that have examined their isolated effects, and most of them are based

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on Begg mechanics.[4,5,19–21] Their effects were compared within two different fixed appliance systems by Ellen et al,[4] who found no difference in lower molar anchorage loss between the use of Class II elastics with bioprogressive and with standard edgewise techniques.

The aim of this prospective study was to compare the skeletal and dentoalveolar effects of Class II elastics applied with the segmental technique either directly with utility arches (UAs) or with an RMCC appliance.

MATERIALS AND METHODS

The study group consisted of 30 patients selected using the following inclusion criteria: Class II division 1 malocclusion, nonextraction treatment plan, and reduced or normal lower facial height combined with deep bite and mandibular dental arch retrusion. Fifteen of the patients (7 boys, 8 girls; mean age 11.4 ± 1.3 years) were treated with the Class II elastics on UAs and the other 15 (9 boys, 6 girls; mean age 13.2 ± 1.7 years) were treated with the RMCC appliance.

Lateral cephalometric radiographs of 15 untreated subjects (8 boys, 7 girls; mean age 11.2 ± 0.5 years) having Class II division 1 malocclusion were used as a control group to distinguish developmental changes from treatment effects. The control group was selected among the patients on the waiting list of our clinic. All patients agreed to participate in this study and signed written consent forms.

Appliance Design and Treatment Protocols

Roth Omni brackets (GAC, Central Islip, NY) were used as a fixed appliance system in both of the treatment groups. Maxillary and mandibular incisors were first aligned with 0.016-inch nickel titanium preformed UAs (GAC). After incisor alignment, 0.016 × 0.0022-inch stainless steel (SS) UAs were inserted and the use of Class II elastics begun. In the maxillary arch, tip-back bends of approximately 45° were placed at the distal of the utility arch before insertion. In the mandibular arch, a utility arch was inserted to stabilize previously aligned incisor and molar segments. Because most of the patients were in the transitional dentition, the posterior segments were not included in the Class II elastic application.

In the UA group, maxillary UAs with hooks distal to the lateral incisors were bent using 0.016 × 0.022-inch SS arch wire. The patients were instructed to wear the elastics 24 hours a day with 3.5 ounces of traction.

In the RMCC group, 0.016 × 0.022-inch SS maxillary UAs were used after the incisor alignment was accomplished. All RMCC appliances in this study were made in the laboratory. The appliance consisted of two parts: a reciprocal maxillary arch and a mini–chin cup (Figures 1 and 2). The maxillary arch, inserted into the maxillary molar tubes, was a 0.045-inch round wire. A vertical step went under the upper lip and two soldered anterior hooks were used to attach intermaxillary Class II elastics. Two headgear tubes were also soldered to the buccal sections for the attachment of the mini–chin cup.

The mini–chin cup is composed of an acrylic section having two anterior 0.045-inch wire hooks at the level of the labial commisure for additional Class II elastic traction from the lower first molar. The maxillary arch was worn for 24 hours a day and the mini–chin cup during sleeping hours at home. All patients were in-

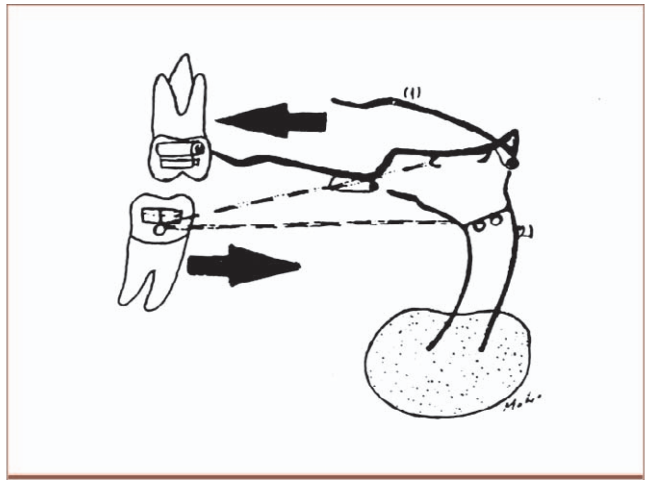

Figure 1. The schematic presentation of the RMCC appliance.[18]

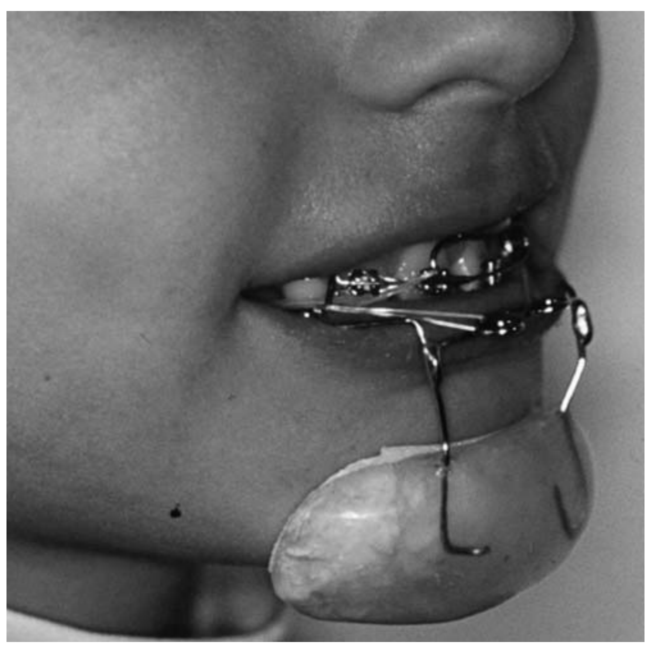

Figure 2. The RMCC appliance.

Table 1. The Cephalometric Changes of the Treatment Groups and the Control Group[a]

Cephalometric Measures	Control			RMCC			UA		
	Mean ± SD		*P*	Mean ± SD		*P*	Mean ± SD		*P*
	T1	T2	T1–T2	T1	T2	T1–T2	T1	T2	T1–T2
Skeletal									
SNA (°)	79.8 ± 3.0	79.5 ± 2.8	—	79.3 ± 2.8	79.2 ± 2.8	—	78.9 ± 3.0	78.5 ± 2.9	*
A-PTV (mm)	51.8 ± 3.1	52.1 ± 3.5	—	52.8 ± 2.7	52.8 ± 2.6	—	51.9 ± 3.1	51.8 ± 3.1	—
SNB (°)	72.55 ± 3.3	72.4 ± 2.9	—	75.1 ± 2.5	75.4 ± 2.4	—	73.6 ± 3.2	74.2 ± 3.6	—
Pg-PTV (mm)	38.7 ± 3.7	39.3 ± 3.8	—	46.2 ± 6.1	46.8 ± 6.9	—	44.3 ± 5.2	45.3 ± 6.0	—
ANB (°)	7.2 ± 1.4	7.1 ± 1.3	—	4.2 ± 1.5	3.7 ± 1.8	*	5.4 ± 1.8	4.3 ± 2.3	*
Max. depth (°)	88.5 ± 2.6	88.2 ± 2.9	—	87.5 ± 2.6	87.3 ± 3.5	—	89.3 ± 2.2	89.2 ± 2.4	—
Facial depth (°)	82.2 ± 1.9	82.3 ± 2.2	—	85.4 ± 3.2	85.5 ± 3.5	—	85.5 ± 2.6	86.3 ± 3.3	—
PP-FH (°)	−1.1 ± 2.8	−0.9 ± 2.7	—	−0.1 ± 5.2	−0.0 ± 4.9	—	1.6 ± 2.2	1.5 ± 2.2	—
LFH (°)	46.0 ± 3.6	46.1 ± 3.2	—	42.9 ± 5.3	44.6 ± 4.9	**	43.4 ± 3.0	45.3 ± 3.7	*
FMA (°)	28.6 ± 3.7	29.4 ± 3.8	—	23.9 ± 6.1	24.9 ± 6.5	*	22.8 ± 4.3	23.5 ± 5.2	—
Dentoalveolar									
U1-FH (°)	111.5 ± 4.3	111.5 ± 3.6	—	116.3 ± 7.2	109.9 ± 5.0	**	117.7 ± 7.0	110.3 ± 9.1	**
U1-FH (mm)	52.1 ± 4.1	54.1 ± 4.5	**	51.4 ± 4.9	52.4 ± 4.9	**	48.7 ± 2.9	50.1 ± 2.8	**
U1-PTV (mm)	55.3 ± 3.4	55.7 ± 3.6	—	57.4 ± 3.7	55.2 ± 3.5	**	56.5 ± 4.0	53.8 ± 4.8	**
IMPA (°)	98.1 ± 3.7	97.8 ± 3.7	—	94.0 ± 4.8	100.7 ± 7.6	**	97.3 ± 6.3	101.3 ± 8.8	*
L1-MP (mm)	41.8 ± 3.4	42.1 ± 3.0	—	40.7 ± 3.2	39.3 ± 2.8	**	39.8 ± 2.6	39.1 ± 3.5	—
L1-PTV (mm)	47.8 ± 4.7	48.8 ± 4.8	*	50.2 ± 3.7	52.7 ± 4.4	**	43.1 ± 4.3	51.6 ± 4.5	**
Overbite (mm)	5.4 ± 2.3	5.6 ± 2.3	—	5.2 ± 1.9	2.8 ± 2.1	**	5.7 ± 1.3	2.2 ± 1.4	**
Overjet (mm)	7.3 ± 2.0	7.2 ± 2.3	—	7.4 ± 2.4	2.5 ± 1.9	**	7.6 ± 1.5	2.2 ± 1.4	**
U6-FH (°)	75.2 ± 5.8	75.2 ± 5.6	—	78.4 ± 42.8	70.4 ± 8.9	**	78.3 ± 5.9	74.7 ± 11.0	—
U6-FH (mm)	41.0 ± 3.8	42.1 ± 3.8	—	42.8 ± 3.6	42.3 ± 4.3	—	39.8 ± 2.3	40.3 ± 2.9	—
U6-PTV (mm)	12.4 ± 2.3	13.9 ± 3.3	*	15.2 ± 3.6	12.8 ± 3.6	**	13.5 ± 3.1	13.2 ± 3.5	—
L6-MP (°)	80.1 ± 5.5	79.9 ± 5.4	—	78.4 ± 6.0	81.8 ± 6.2	*	80.1 ± 6.5	73.9 ± 8.4	**
L6-MP (mm)	29.5 ± 3.3	29.5 ± 3.6	—	26.4 ± 1.9	27.7 ± 2.5	**	27.5 ± 1.8	29.3 ± 1.9	**
L6-PTV (mm)	9.6 ± 2.3	10.3 ± 2.6	—	12.7 ± 4.1	14.9 ± 4.3	**	11.6 ± 2.9	13.4 ± 3.1	**
OP-FH (dg)	12.7 ± 2.6	12.1 ± 2.3	—	7.1 ± 4.6	9.8 ± 5.5	**	7.7 ± 4.0	11.0 ± 4.5	**
Molar relation (mm)	2.1 ± 1.2	2.6 ± 1.4	—	2.5 ± 1.3	−2.0 ± 1.03	**	1.8 ± 2.1	−0.1 ± 2.7	**
Soft tissue									
LL-E (mm)	2.2 ± 2.4	79.5 ± 2.8	—	−1.3 ± 2.4	−0.9 ± 3.4	—	−0.1 ± 2.6	−0.4 ± 2.4	—
Nasolabial (°)	114.4 ± 10.6	52.1 ± 3.5	—	113.6 ± 10.1	111.9 ± 10.3	—	112.5 ± 6.4	112.4 ± 8.5	—
Labiomental (°)	97.5 ± 17.3	72.4 ± 2.9	—	89.0 ± 23.4	103.7 ± 20.2	**	102.7 ± 17.8	120.6 ± 11.1	**

[a] n = 15 for each group. RMCC indicates Reciprocal Mini-Chin Cup, UA, utility arch; T1, before treatment; T2, after Class I relationship achieved; and —, nonsignificant.
* *P* = .05; ** *P* = .01; *** *P* = .001.

structed to use elastic traction of 3.5 ounces with both of the parts.

Cephalometric Analysis

In order to determine the pure effects of the elastics in the treatment groups, standard lateral cephalograms were exposed just before the application of the Class II elastics and right after the correction of the Class II relationships.

The skeletal, dental, and soft tissue measurements used in the study are shown in Tables 1 and 2. Pancherz's[22,23] mathematical model was used to analyze the linear skeletal and dental contributions to the overjet and molar corrections, and the percentages were calculated. PTV was used as a vertical perpendicular reference plane (Figure 3).

The dental changes within the jaw bases were calculated using:[22,23]

U1-PTV minus A-PTV; change in position of the central upper incisor within the maxillary base (U1-A);

L1-PTV minus Pg-PTV; change in position of the central lower incisor within the mandibular base (L1-Pg);

U6-PTV minus A-PTV; change in position of the first upper molar within the maxillary base (U6-A);

L6-PTV minus Pg-PTV; change in position of the first lower molar within the mandibular base (L6-Pg).

Statistical Analysis

The arithmetic mean and standard deviations were calculated for each cephalometric variable. The Wil-

Table 2. Comparison of Cephalometric Changes Among the Treatment and the Control Groups[a]

Cephalometric Measures	Mean ± SD			P		
	Control	RMCC	UA	Control-RMCC	Control-UA	RMCC-UA
Skeletal						
SNA (°)	−0.2 ± 0.6	0.0 ± 0.3	−0.4 ± 0.7*	—	—	—
A-PTV (mm)	0.3 ± 0.9	0.0 ± 0.3	0.0 ± 0.8	—	—	—
SNB (°)	−0.1 ± 0.6	0.2 ± 0.5	0.6 ± 1.8	—	—	—
Pg-PTV (mm)	0.6 ± 1.6	0.5 ± 1.2	0.9 ± 2.1	—	—	—
ANB (°)	−0.0 ± 0.6	−0.4 ± 0.6*	−1.1 ± 1.4*	—	—	—
Maximum depth (°)	−0.3 ± 0.5	−0.2 ± 0.6	−0.1 ± 0.7	—	—	—
Facial depth (°)	0.0 ± 0.6	0.0 ± 0.5	0.8 ± 1.3	—	—	—
PP-FH (°)	0.2 ± 0.3	0.1 ± 1.9	−0.1 ± 1.3	—	—	—
LFH (°)	0.0 ± 0.8	1.7 ± 1.3**	1.9 ± 2.5*	**	**	—
FMA (°)	0.8 ± 1.5	1.0 ± 1.7*	0.6 ± 1.5	—	—	—
Dentoalveolar						
U1-FH (°)	−0.0 ± 0.8	−6.4 ± 4.0**	−7.4 ± 9.4**	***	*	—
U1-FH (mm)	1.9 ± 1.3**	0.9 ± 0.8**	1.3 ± 1.4**	—	—	—
U1-PTV (mm)	0.4 ± 1.3	−2.1 ± 0.9**	−2.7 ± 2.5**	***	**	—
IMPA (°)	−0.3 ± 1.1	6.6 ± 6.6**	4.0 ± 7.2*	**	*	—
L1-MP (mm)	0.2 ± −0.6	−1.4 ± 1.4**	−0.7 ± 1.6	**	*	—
L1-PTV (mm)	1.0 ± 0.9*	2.5 ± 2.1**	2.4 ± 1.8**	*	*	—
Overbite (mm)	0.2 ± 0.9	−2.4 ± 2.1**	−3.5 ± 1.9**	**	***	—
Overjet (mm)	0.0 ± 0.8	−4.7 ± 2.1**	−5.2 ± 2.1**	***	***	—
U6-FH (°)	0.0 ± 0.8	−8.0 ± 7.3**	−3.5 ± 1.8	**	**	—
U6-FH (mm)	1.1 ± 1.0	−0.4 ± 1.4	0.5 ± 1.1	**	—	—
U6-PTV (mm)	0.8 ± 0.7*	−2.3 ± 1.8**	−0.3 ± 1.8	***	**	*
L6-MP (°)	−0.2 ± 0.6	3.4 ± 5.3*	−6.1 ± 7.3**	*	*	**
L6-MP (mm)	0.0 ± 0.4	1.3 ± 1.1**	1.7 ± 0.9**	**	***	—
L6-PTV (mm)	0.7 ± 1.0	2.2 ± 1.3**	1.7 ± 1.40**	**	*	—
OP-FH (°)	−0.6 ± 1.1	2.6 ± 2.5**	3.2 ± 2.9**	**	**	—
Molar relation (mm)	0.5 ± 0.8	−4.5 ± 1.4**	−2.0 ± 1.6**	***	**	***
Soft tissue						
LL-E (mm)	−0.5 ± 1.3	0.4 ± 1.8	−0.3 ± 1.4	—	—	—
Nasolabial (°)	−2.0 ± 2.7	−1.6 ± 5.9	−3.3 ± 6.2	—	—	—
Labiomental (°)	−1.6 ± 10.0	14.7 ± 10.9**	17.8 ± 22.4**	**	*	—

[a] n = 15 for each group. RMCC indicates Reciprocal Mini-Chin Cup, UA, utility arch; and —, nonsignificant.
* $P = 0.5$; ** $P = .01$; *** $P = .001$.

coxon test was used for in-group comparisons and the Mann-Whitney *U*-test for intergroup comparisons.

RESULTS

The mean treatment time was significantly shorter with the RMCC appliance (4.6 ± 1.7 months) when compared with the UA + Class II elastic combination treatment (8.5 ± 2.6 months; $P < .001$). The mean control period was 10 ± 2.2 months.

Skeletal Changes

Comparison of the treatment groups with the control group showed no statistically significant skeletal changes during elastic application, except for the LFH angle (Table 2). A significant increase in the LFH angle of 1.7° ($P < .01$) was measured in the RMCC group, and a significant increase of 1.9° ($P < .05$) in the UA group. There were no other significant skeletal changes among the three groups.

Dentoalveolar and Soft Tissue Changes

The upper incisors retroclined and moved backward ($P < .01$), and lower incisors tipped forward (RMCC, $P < .01$; UA, $P < .05$) in both of the treatment groups. The lower incisors intruded 1.4 mm ($P < .01$) in the RMCC group and 0.7 mm in the UA group. In the RMCC group, the upper molars tipped distally 8.0° ($P < .01$), along with distal movement, as shown by a decrease of 2.3 mm ($P < .01$) in the U6-PTV distance. In the UA group there was no significant change in the upper molar measurements, but the lower molars extruded and moved mesially significantly in both of the treatment groups (Table 1).

There were significant reductions of 4.7 mm ($P < .01$) in overjet and 2.4 mm ($P < .01$) in overbite in the RMCC group. In the UA group, the overjet was significantly reduced by 5.2 mm ($P < .01$) and overbite by 3.5 mm ($P < .01$).

Comparison of the RMCC and the UA groups

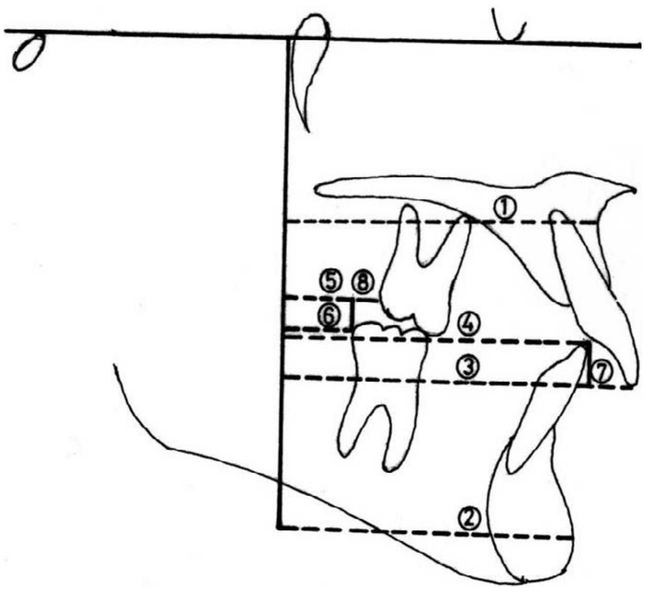

Figure 3. The linear measurements used to analyze skeletal and dental contributions to the overjet and the molar corrections. (1) A-PTV (mm); (2) Pg-PTV (mm); (3) U1-PTV (mm); (4) L1-PTV (mm); (5) U6-PTV (mm); (6) L6-PTV (mm); (7) overjet (U1PTV-L1PTV); (8) molar relationship (U6PTV-L6PTV).

showed statistically significant differences for three dentoalveolar measurements. In the RMCC group, the upper molar distal movement (−2.3 mm; $P < .05$), lower molar mesial tipping (3.4°; $P < .01$), and improvement of the molar relationship were greater (−4.5 mm; $P < .001$) than in the UA group.

Dentoalveolar changes in both treatment groups were statistically significant when compared with the growth changes in the control group. The exceptions among the three groups were for vertical linear movement of the maxillary incisors with respect to the FH plane, and also for upper molar vertical movement in the UA group, which showed a nonsignificant difference with the control group.

Significant ($P < .01$) treatment changes were seen in the labiomental angle in the both treatment groups. This angle increased by 14.7° and 17.8° in the RMCC and UA groups, respectively. There were no significant differences in LL-E distance or nasolabial angle.

Treatment Changes by Percentages

In the RMCC group, 87.82% of overjet reduction and 87.36% of molar relation correction was dentoalveolar. In the UA group, 80.76% of overjet reduction and 51.47% of molar relation correction was dentoalveolar. The maxillary incisor backward movement contributed 45% of the whole overjet reduction in the RMCC group and 52% in the UA group. Lower incisor forward movement contribution was greater in the RMCC group (43%) than in the elastic group (29%).

Maxillary molar distal movement contributed 51% of the molar correction in the RMCC group and only 12% in the UA group. The mandibular molar forward movement was 36% in the RMCC and 39% in the UA group.

DISCUSSION

It is not always easy to differentiate between active treatment effects and normal growth, especially with a long observation period. In order to determine the isolated effects of the elastics in this study, the observation period was limited to the time of Class II elastic usage. Also, an untreated control group that was well matched with the treatment groups was used to distinguish developmental changes from treatment effects. Significant intergroup differences were noted for only a few initial measurements. The control group initially had a more retrusive mandible and a greater ANB angle when compared with the treatment groups. However, all subjects had a similar Class II division 1 growth pattern with a retrusive mandible.

Treatment Effects

The observation period was longer in the RMCC group than in the UA group. The mean correction time of the RMCC group was approximately half that of the UA group (4.6 ± 1.7 months and 8.5 ± 2.6 months, respectively). This result is in accordance with Langlade's report.[18] In the other previous studies, the mean correction time of dental relationships with Class II elastics were also reported to be between 6 months and 1.3 years.[4,5,19,20] Therefore, it is obvious that the RMCC appliance system significantly reduced the elastic application time. This is also important in motivating the patients. The longer the correction time, the less willing the patients are to complete the treatment.

In both treatment groups, the only significant skeletal difference from the control group was the increase of the LFH angle, which is in general agreement with the results of the previous studies.[5,6,10,20,24] The percentages also showed that the overjet reduction and the improvement in the molar relationship were mainly dental, as expected.[19–21,24]

It was apparent that significant dentoalveolar changes did occur within the treatment groups when compared with the control group. The exceptions were U6-FH distance in the UA group, and the vertical linear movement of the upper incisors (U1-FH) in both of the treatment groups. In this study, the extrusion of the upper incisors with Class II elastics did not exceed normal growth changes. This can be the result of the intrusive effect of the UAs on the upper incisors. An in vitro study showed that the effect of Class II elastics in reducing the intrusive force of an arch wire is less

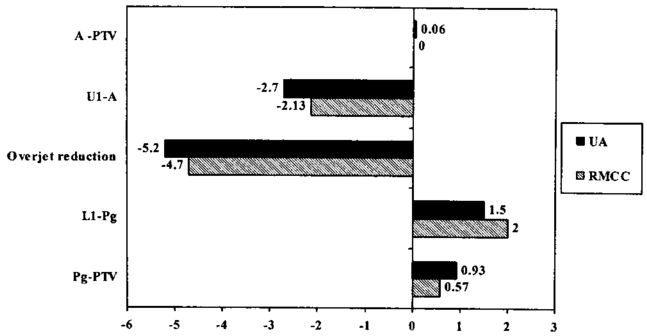

Figure 4. The effects of skeletal and dental linear changes in the overjet reduction. U1-A (mm) = (U1-PTV) − (A-PTV); L1-Pg (mm) = (L1-PTV) − (Pg-PTV).

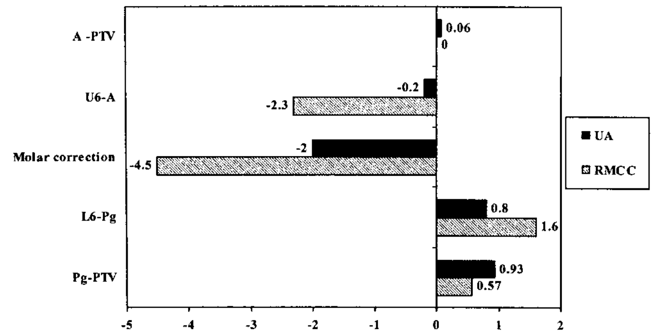

Figure 5. The effects of skeletal and dental linear changes in the molar correction. U6-A (mm) = (U6-PTV) − (A-PTV); L6-Pg (mm) = (L6-PTV) − (Pg-PTV).

than what was previously believed.[17] The nonsignificant extrusion of the upper incisors in this present study is in conflict with previous reports in which the treatment changes were not compared with a control group.[4,5,19]

When comparing the treatment groups with each other, there were significant differences in three dental measurements. The distal movement of the upper first molar, the mesial tipping of the lower first molar, and the improvement of the molar relationship were significantly greater in the RMCC group than in the UA group. The maxillary molars were tipped, intruded, and moved distally with the RMCC application. The Class II elastics on the utility arch only prevented their normal mesial movement. In limited studies investigating the effects of Class II elastics on the upper molar movements, similar findings were shown.[4,5,18,19]

Although statistical significances were recorded for only three measurements, there were other dentoalveolar differences between the two groups that should be considered as clinically important. Although the RMCC appliance was significantly more effective on molar correction, elastics on UAs were more effective for overjet reduction (Figures 4 and 5). In the RMCC group, the upper incisors were less retroclined, were less extruded, and moved backward less, whereas the lower incisors were tipped more forward and were more intruded than those in the UA group. The reason the RMCC is more effective on upper first molars and less effective on upper incisors can be explained by the transmission of both the elastic force and the upper lip force directly to the molars through the maxillary arch, creating a "lip bumper" effect.[18,25] The explanation for the greater forward movement of the lower arch in the RMCC group is the increase of the horizontal vector of the Class II elastic force when the chin is used as an anchorage unit.

These results confirmed that Class II elastic applications should be varied according to the clinical objective of the individual case. Elastic use with the RMCC appliance can be recommended for selected cases in which less effect is desired on maxillary incisors, but there is a need for distalization of maxillary first molars.

This study was concerned with the immediate treatment effects of the Class II elastic applications. However, the long-term implications of different elastic systems need to be investigated.

CONCLUSIONS

- The RMCC appliance is a valuable alternative treatment method for Class II dental malocclusion in selected cases.
- The RMCC appliance corrects the molar relationship and overjet in a very short period of treatment time by distal upper molar movement and protrusion of the mandibular dental arch, with less extrusive and uprighting effects on the maxillary incisors.

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