

Asymmetric dental arch treatment with Forsus fatigue appliances: Long-term results

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ABSTRACT

Objectives: To investigate the treatment efficacy and follow-up stability of the asymmetric Forsus appliance by evaluating longitudinal changes in dental arch asymmetry on digital dental models from 21 patients.

Materials and Methods: Maxillary and mandibular reference lines were used for measurements of intra-arch asymmetry at pretreatment (T1), posttreatment (T2), and 4.2 years after treatment (T3). Maxillary and mandibular measurements were performed relative to the dental midline and anterior reference line on digital dental models. To determine the amount of asymmetry between the Class I and Class II sides of a given arch, all maxillary and mandibular parameters were measured on each side of the model separately. Repeated-measures analysis of variance/paired sample *t*-tests were performed to evaluate dental arch asymmetries at the $P < .05$ level.

Results: The alveolar transverse dimensions of the posterior segment of both arches were increased during treatment ($P < .05$) and remained stable during the retention period. Class II subdivision malocclusion was caused by distal positioning of the mandibular canine, premolars, and first molar on the Class II side ($P < .05$). Asymmetry was resolved by treatment with asymmetric Forsus appliances. The resolved asymmetry remained stable over the long term. There were no significant differences between T2 and T3 ($P > .05$).

Conclusions: The asymmetric Forsus appliance can be used to treat dental arch asymmetry in patients with Class II subdivision malocclusions. (*Angle Orthod.* 2019;89:688–696.)

KEY WORDS: Forsus fatigue; Class II subdivision; Asymmetry

INTRODUCTION

Class II malocclusions are a frequent dental problem. Angle¹ classified the Class II subdivision molar relationship as a subgroup of Class II malocclusions. In this occlusion, one side had Class I characteristics, while the other had Class II characteristics, with the right and left sides of the occlusion asymmetric. The asymmetry could be due to a dental or skeletal issue or to a combination of both.² Unilateral distal position of

the mandibular first molar is a common factor in the molar relationship in the presence of a Class II subdivision.^{3–6} Mesial positioning of the upper molars,⁵ posterior positioning of the glenoid fossa,⁷ mandibular asymmetry,^{2,8,9} and functional shifts^{7,10,11} can also cause this malocclusion.

Orthodontic treatment should be determined based on the etiology of the asymmetry. Treating such Class II malocclusions is intrinsically difficult and typically involves asymmetric extraction, mechanics, or surgery. However, many patients reject surgery, and thus, orthodontists may use an alternative treatment modality such as Class II elastics, extractions, extraoral traction, orthodontic distalizers, temporary skeletal anchorage devices, and fixed functional appliances.¹²

Various intra- and extraoral orthodontic appliances are used to treat Class II malocclusions. The Forsus fatigue-resistant device (3M Unitek, Monrovia, Calif) is an intraoral semirigid fixed functional appliance for treating Class II malocclusions. It is fracture resistant, exerts consistent force, and is easy to use.

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Few studies have assessed the efficacy of Forsus appliances in Class II subdivision patients, and no studies have evaluated long-term outcomes. The purpose of this study was to investigate the treatment efficacy and long-term stability of the asymmetric Forsus appliance by evaluating longitudinal changes in dental arch asymmetry using digital dental models.

MATERIALS AND METHODS

This study was approved by the Ethical Committee of the Faculty of Dentistry, Noninvasive Ethical Committee of Dentistry, Faculty of Selcuk University. Patients were selected retrospectively from the archives of the Department of Orthodontics, Faculty of Dentistry, Selcuk University. One hundred fifty patients with Class II subdivision malocclusions treated orthodontically with an asymmetric Forsus appliance were evaluated. Patients were selected based on the initial anteroposterior dental relationship on lateral cephalograms and dental models. The inclusion criteria were (1) Angle Class II subdivision malocclusion in the permanent dentition, based on the presence of a Class I molar relationship on one side and at least an end-to-end Class II molar relationship on the other; (2) 13–18 years old; (3) no previous orthodontic treatment; (4) all permanent teeth up to the first molars present; (5) no anterior or posterior crossbite; (6) no history of facial trauma, medical conditions, or TMJ problems that could have altered the growth of the apical base; (7) no lateral mandibular shift during closure on clinical examination; (8) no ectopic teeth or anomalies in tooth shape; (9) nonextraction treatment indicated; (9) normal or slightly increased overbite; (10) mandibular plane angle (SN-GoGn) $\leq 36^\circ$; (11) models without fractured cusps or severe attrition; and (11) bilateral Class I canine relationships. Exclusion criteria were (1) patients who discontinued treatment and (2) treatment obtained by headgear or extraction treatment. According to the power analysis with a .05 level and 85% power to detect a difference of 1.5 mm (± 1.32 mm) for midline correction based on the findings of Bock et al.,¹³ the required minimum sample size was 19 for the study group.

Twenty-one patients treated with asymmetric Forsus appliances were enrolled in this study. In all patients, Forsus appliances were used after the maxillary arch was aligned using MBT brackets (0.022-inch slot size prescription). In all patients, 0.019×0.025 -inch stainless-steel archwires were inserted and cinched back (no additional root torque or skeletal anchored). Forsus appliances were placed from the maxillary first molar to the mandibular canine on the Class II side. The plaster models were scanned using a 3Shape R700 (Copenhagen K Denmark) surface scanner and converted to digital orthodontic models using ScanIt

Table 1. Abbreviations of Model Landmarks

Abbreviation	Definition
U1/L1	Midincisal edge of upper/lower lateral incisors
U2/L2	Midincisal edge of upper/lower lateral incisors
U3/L3	Upper/lower canine cusp tip
U4/L4	Upper/lower first premolar buccal cusp tip
U5/L5	Upper/lower second premolar buccal cusp tip
U6MB/L6MB	Upper/lower first molar mesiobuccal cusp tip
U6DB/L6DB	Upper/lower first molar distobuccal cusp tip

Orthodontics (Copenhagen K Denmark) in stereo-lithography format. The digital models were analyzed by an investigator (Dr Öztürk) using 3-Shape Orthoanalyzer software (version 1.0; 3Shape A/S, Copenhagen, Denmark). Cast measurements were based on information in Veli et al.¹⁴ To determine the amount of asymmetry between the Class I and Class II sides of a given arch, all maxillary and mandibular parameters were measured on both sides of the digital models separately. Maxillary and mandibular measurements were performed relative to the dental midline and anterior reference line. The median raphe was used as the dental midline, and the anterior reference line was constructed perpendicular to the transferred median raphe through the midpoint between the central incisors using the horizontal default position of the software. Horizontal and vertical measurements were made bilaterally from the midincisal edges of anterior teeth, the cusp tips of canine teeth, and the buccal cusp tips of posterior teeth. Definitions and abbreviations of model landmarks are listed in Table 1. Linear measurements were made bilaterally from the tooth landmarks to the horizontal and vertical reference lines on the maxillary and mandibular dental models (Figures 1–4). Measurements were made at pretreatment (T1), posttreatment (T2), and 4.2 years after treatment (T3).

Statistical Analysis

To assess the method error level of measurements, 20 digital models were randomly selected, and measurements were repeated at a 4-week interval by the same investigator. The Dahlberg formula was used to calculate method error,¹⁵ and systematic error was calculated by paired-sample *t*-tests at $P < .05$. The differences between the first and second measurements were not significant.

Statistical analyses were performed using the Statistical Package for the Social Sciences (version 21.0; SPSS Inc, Chicago, Ill). All of the data were found to be normally distributed with homogeneous variance; therefore, parametric tests were used. The means and SDs of all parameters measured were calculated. A paired *t*-test was used to evaluate the

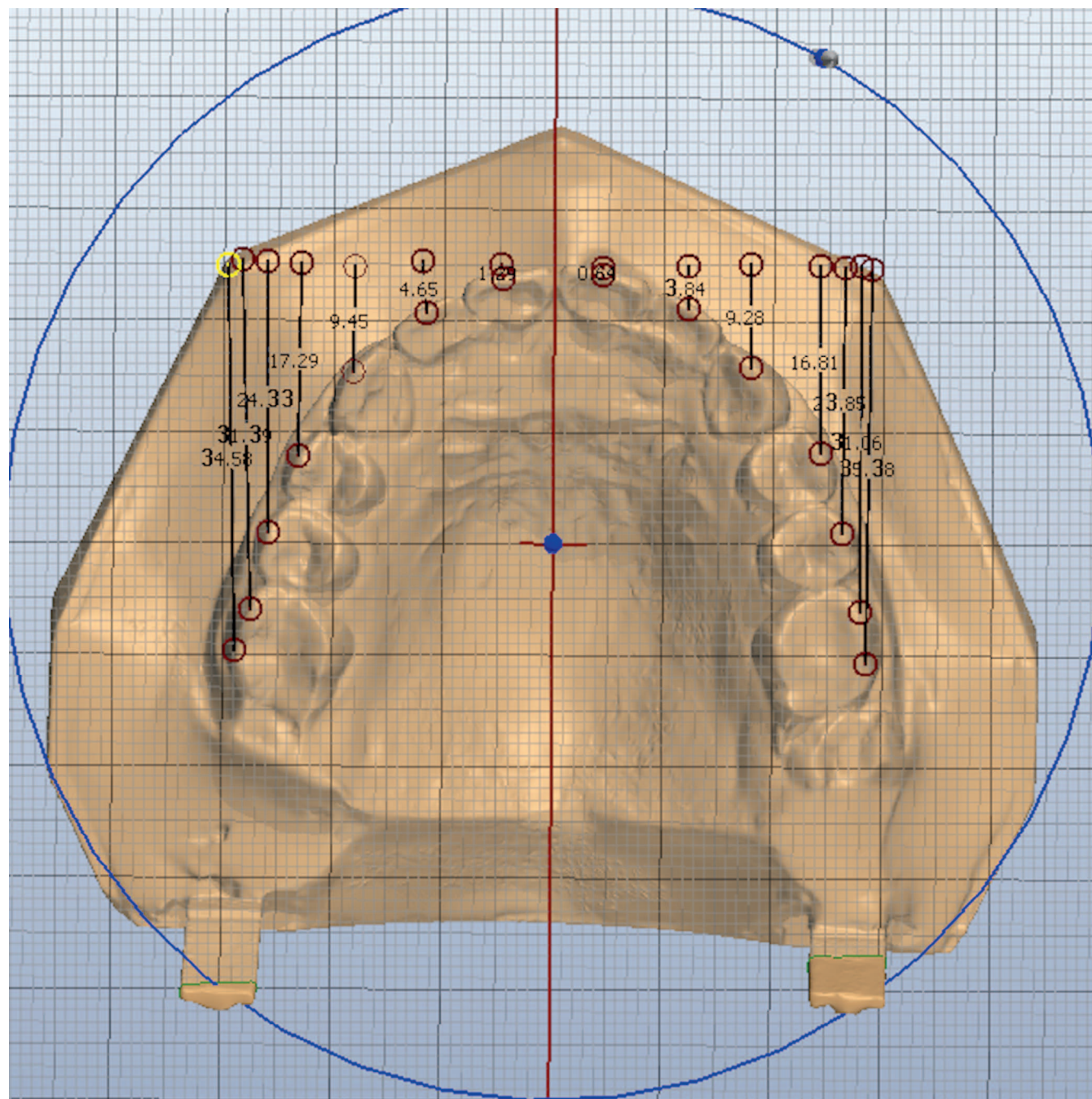


Figure 1. Linear measurements from bilateral tooth landmarks to the horizontal reference line on the maxillary dental model. ARL, anterior reference line.

significance of differences in means between groups. Group differences were evaluated by one-way analysis of variance, and post hoc comparisons were performed using the Tukey test. Statistical significance was set as $P < .05$.

RESULTS

The absolute differences between vertical measurements on the Class I and Class II sides are listed in

Tables 2 and 3. The absolute differences between horizontal measurements are listed in Tables 4 and 5. The alveolar transverse dimensions of the posterior segment in both arches were increased during treatment ($P < .05$) and remained stable over the long term. Before treatment, all subjects had significant asymmetry between the Class I and Class II sides in the mandible, and Class II subdivision malocclusions were caused by distal positioning of the mandibular

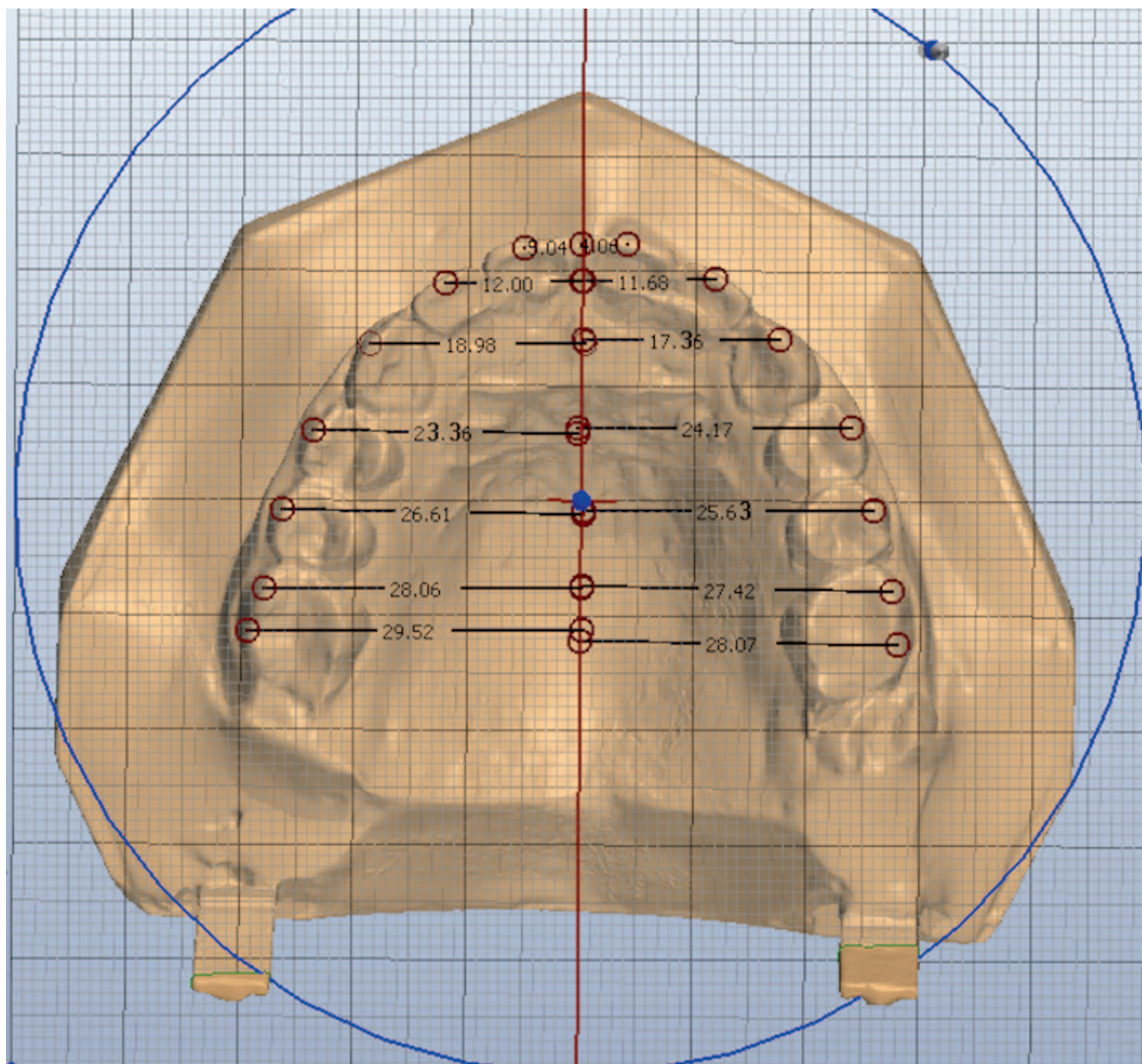


Figure 2. Linear measurements from bilateral tooth landmarks to the vertical reference line on the maxillary dental model. MR, median raphe.

canine, premolars, and first molar on the Class II side ($P < .05$).

Asymmetry was resolved after treatment with asymmetric Forsus appliances and remained stable over the long term. There was no significant difference between T2 and T3 ($P > .05$). No significant changes in intra-arch asymmetry were detected in the maxillary and mandibular dental arches at any time point.

DISCUSSION

Knowledge of changes in occlusion during development is important for planning orthodontic treatment.^{15,16} Treatment and retention planning for Class

II subdivision malocclusions are hampered by their asymmetric occlusal relationship. Few studies have assessed the treatment of Class II subdivisions with Forsus appliances, and none has evaluated the long-term treatment efficacy. Therefore, this study investigated the efficacy and stability of treatment with the asymmetric Forsus appliance by evaluating longitudinal changes in dental arch asymmetry after treatment of Class II subdivisions. Dental models selected by a blinded examiner according to the selection criteria were evaluated retrospectively. Before treatment, all subjects had significant asymmetry between the Class I and Class II sides in the mandible; the Class II

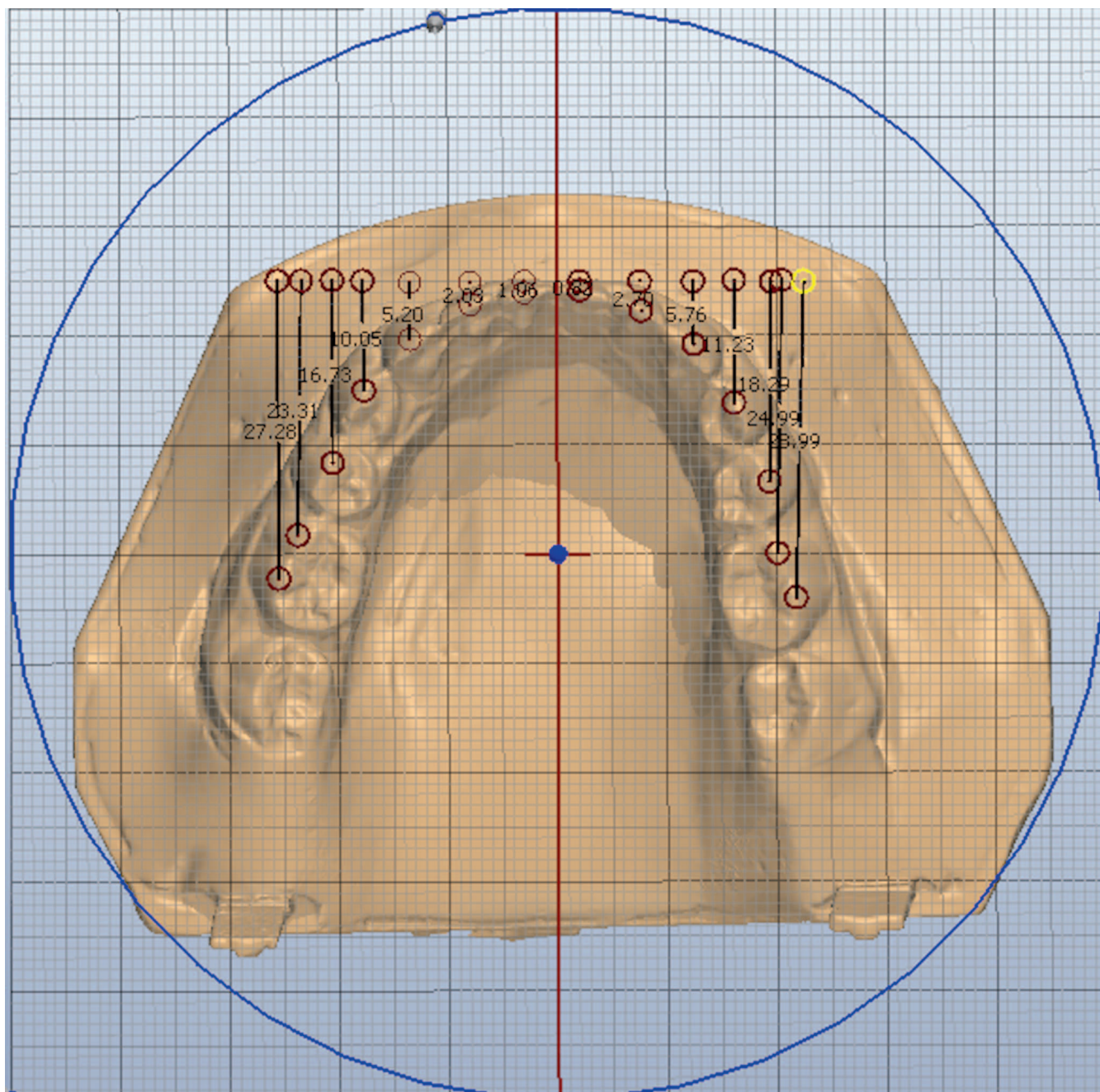


Figure 3. Linear measurements from bilateral tooth landmarks to the horizontal reference line on the mandibular dental model. ARL, anterior reference line.

subdivision malocclusion was corrected to a Class I molar relationship bilaterally using the asymmetric Forsus appliance. No relapse occurred during the retention period.

Janson et al.¹⁷ reported frequencies of 61.4% type 1 (due to mandibular asymmetry), 18.2% type 2 (due to maxillary asymmetry), and 20.5% combined Class II subdivision malocclusions in 44 untreated subjects. All cases reported in the present study were type 1 Class II subdivision malocclusions as determined using a

reference line connecting the superior points of the orbital contours.

Scanning technology was used to convert plaster models into three-dimensional (3D) digital models.¹³ Although plaster dental models are typically used in orthodontic diagnosis and treatment planning, they must be stored under appropriate conditions, may provide imprecise information, are labor intensive, and have a high risk of breakage and distortion.^{18–20} In contrast, measurements using 3D digital models are

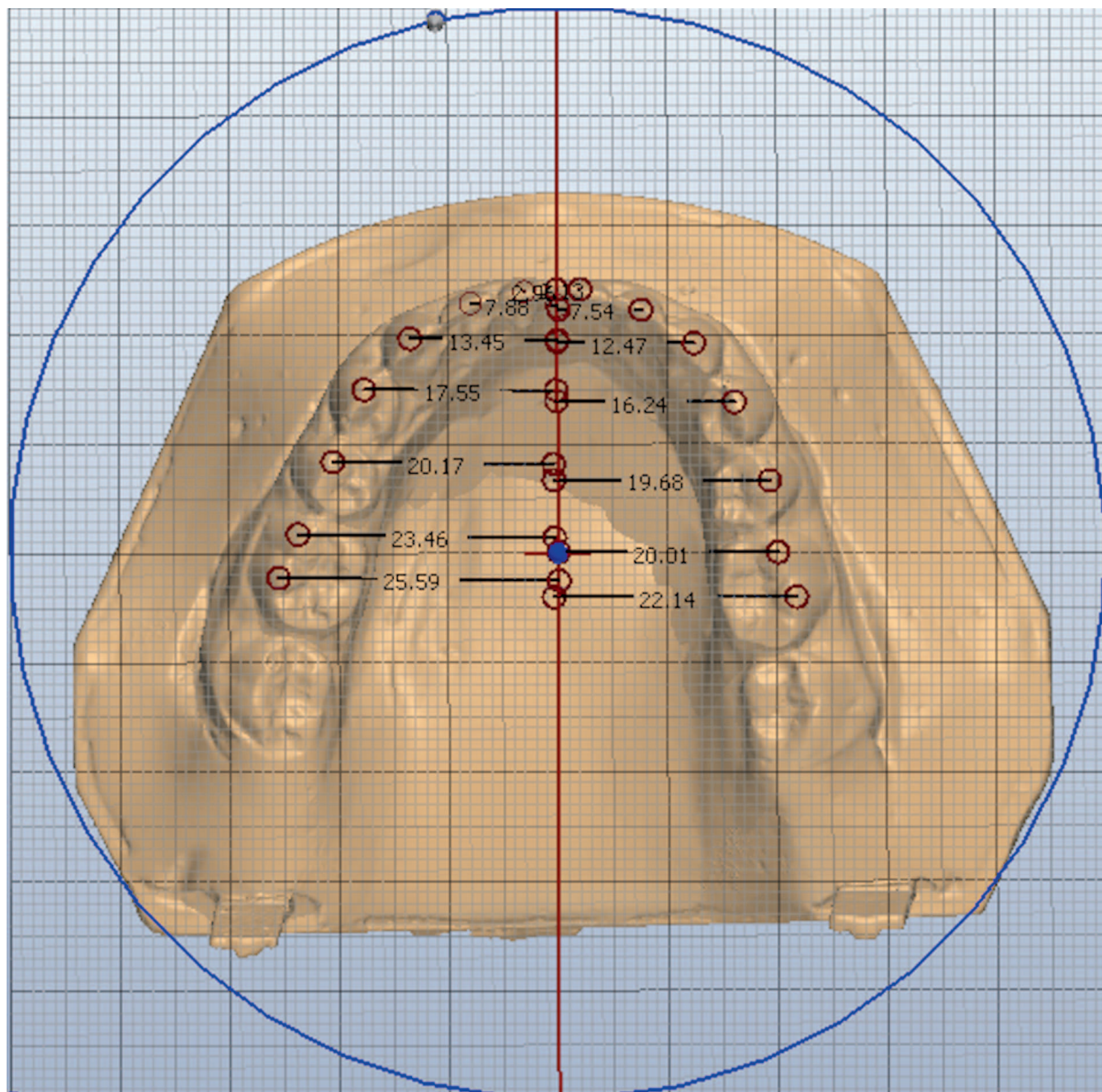


Figure 4. Linear measurements from bilateral tooth landmarks to the vertical reference line on the mandibular dental model. MR, median raphe.

rapid, reliable, and reproducible.^{21–23} Gracco et al.,²¹ Alcan et al.,²² and Sousa et al.²³ evaluated the reliability of linear dental anatomic measurements from plaster and digital models; the accuracy and reliability of digital orthodontic models were similar to those of traditional plaster models. Because of their various advantages, 3D digital models were preferred for use in this study.

In previous studies, the cause of asymmetry was found to be generally dentoalveolar, most frequently distal eruption of the mandibular first molars on the Class II side in relation to normally positioned maxillary

first molars and rarely mesial eruption of maxillary molars on the Class II side.^{2–4,19,24} The findings of the current study supported previous reports that Class II subdivision malocclusion was caused by distal positioning of the mandibular canine, premolars, and first molar on the Class II side.

Recently, Aras and Pasaoglu²⁵ compared the efficacy of a Forsus appliance and intermaxillary elastics for Class II subdivision treatment and reported that the Forsus appliance was effective and required a shorter treatment time. Ross et al.⁴ used unilateral Forsus

Table 2. Statistical Comparisons of Absolute Differences Between Anterior-Posterior Measurements of Upper and Lower Bilateral Dental Landmarks^a

	T1, Mean $\pm$ SD			T2, Mean $\pm$ SD			T3, Mean $\pm$ SD		
	Class I Side	Class II Side	P	Class I Side	Class II Side	P	Class I Side	Class II Side	P
Upper									
U1-ARL	1.12 $\pm$ 0.21	1.04 $\pm$ 0.19	NS	1.09 $\pm$ 0.25	1.05 $\pm$ 0.22	NS	1.05 $\pm$ 0.31	1.08 $\pm$ 0.29	NS
U2-ARL	4.62 $\pm$ 0.43	4.79 $\pm$ 0.55	NS	4.26 $\pm$ 0.42	4.19 $\pm$ 0.51	NS	4.22 $\pm$ 0.54	4.20 $\pm$ 0.48	NS
U3-ARL	9.89 $\pm$ 0.73	10.13 $\pm$ 0.84	NS	9.21 $\pm$ 0.67	9.32 $\pm$ 0.73	NS	9.39 $\pm$ 0.72	9.48 $\pm$ 0.81	NS
U4-ARL	17.56 $\pm$ 1.23	18.02 $\pm$ 1.30	NS	16.98 $\pm$ 0.88	17.05 $\pm$ 0.92	NS	17.32 $\pm$ 1.10	16.85 $\pm$ 1.07	NS
U5-ARL	23.65 $\pm$ 1.41	24.07 $\pm$ 1.07	NS	23.17 $\pm$ 1.31	23.36 $\pm$ 1.44	NS	23.63 $\pm$ 1.43	22.98 $\pm$ 0.98	NS
U6MB-ARL	27.92 $\pm$ 1.63	28.40 $\pm$ 1.72	NS	27.31 $\pm$ 1.52	27.68 $\pm$ 1.68	NS	28.03 $\pm$ 1.73	27.48 $\pm$ 1.82	NS
U6DB-ARL	35.78 $\pm$ 2.14	36.21 $\pm$ 2.31	NS	34.91 $\pm$ 2.04	35.36 $\pm$ 1.95	NS	35.22 $\pm$ 1.98	35.90 $\pm$ 2.13	NS
Lower									
L1-ARL	0.63 $\pm$ 0.15	0.53 $\pm$ 0.20	NS	0.48 $\pm$ 0.17	0.52 $\pm$ 0.23	NS	0.58 $\pm$ 0.21	0.61 $\pm$ 0.26	NS
L2-ARL	2.75 $\pm$ 0.34	2.98 $\pm$ 0.42	NS	2.04 $\pm$ 0.36	2.26 $\pm$ 0.45	NS	2.24 $\pm$ 0.52	2.54 $\pm$ 0.41	NS
L3-ARL	5.48 $\pm$ 1.03	8.61 $\pm$ 0.93	***	4.89 $\pm$ 0.95	4.98 $\pm$ 1.12	NS	5.22 $\pm$ 0.82	5.56 $\pm$ 1.04	NS
L4-ARL	11.04 $\pm$ 1.17	15.20 $\pm$ 1.27	***	10.46 $\pm$ 1.32	11.04 $\pm$ 1.27	NS	11.24 $\pm$ 1.29	12.10 $\pm$ 1.73	NS
L5-ARL	18.26 $\pm$ 1.31	22.47 $\pm$ 1.44	***	18.04 $\pm$ 1.29	18.21 $\pm$ 1.33	NS	18.53 $\pm$ 1.45	19.32 $\pm$ 1.82	NS
L6MB-ARL	24.52 $\pm$ 2.01	28.92 $\pm$ 1.87	***	23.87 $\pm$ 1.52	23.99 $\pm$ 1.47	NS	24.29 $\pm$ 2.16	25.08 $\pm$ 1.95	NS
L6DB-ARL	29.81 $\pm$ 2.29	32.83 $\pm$ 2.19	***	29.08 $\pm$ 1.97	29.54 $\pm$ 2.10	NS	30.02 $\pm$ 2.41	30.42 $\pm$ 2.29	NS

^a NS indicates statistically not significant.* $P < .05$; ** $P < .01$; *** $P < .001$.

appliances in a Class II subdivision patient and reported that treatment was completed in a short time with no breakage. In the present study, asymmetry was resolved by treatment with asymmetric Forsus appliances. The results indicated that the maxilla did not have an effect in Class II subdivision malocclusion according to the dental arch asymmetry as had been reported by others.¹³⁻¹⁸

Bock et al.¹³ evaluated treatment of Class II subdivisions using a Herbst appliance and compared Class II malocclusion using study models before (T1) and after Herbst treatment (T2), as well as examined

multibracket treatment (T3) and retention over time (T4). They reported that Herbst treatment was successful with respect to occlusal correction and retention in both groups, and Class III malocclusions were more frequent in Class II subdivision patients, whereas mild Class II malocclusions were more frequent in Class II cases. In the present study, the resolved asymmetry remained stable over the long term. Achieving and maintaining a Class I molar and canine relationship is the main goal of treatment of Class II subdivision malocclusion.

Table 3. Statistical Comparisons of Absolute Differences Between Anterior-Posterior Measurements of Upper and Lower Bilateral Dental Landmarks^a

	Post Hoc Comparison							
	Sign One Way		T1-T2		T1-T3		T2-T3	
	Class I Side	Class II Side	Class I Side	Class II Side	Class I Side	Class II Side	Class I Side	Class II Side
Upper								
U1-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U2-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U3-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U4-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U5-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U6MB-ARL	NS	NS	NS	NS	NS	NS	NS	NS
U6DB-ARL	NS	NS	NS	NS	NS	NS	NS	NS
Lower								
L1-ARL	NS	NS	NS	NS	NS	NS	NS	NS
L2-ARL	NS	NS	NS	NS	NS	NS	NS	NS
L3-ARL	NS	***	NS	***	NS	***	NS	NS
L4-ARL	NS	***	NS	***	NS	**	NS	NS
L5-ARL	NS	***	NS	***	NS	**	NS	NS
L6MB-ARL	NS	***	NS	***	NS	***	NS	NS
L6DB-ARL	NS	***	NS	***	NS	***	NS	NS

^a NS indicates statistically not significant.* $P < .05$; ** $P < .01$; *** $P < .001$.

Table 4. Statistical Comparisons of Absolute Differences Between Horizontal Measurements of Upper and Lower Bilateral Dental Landmarks and Arch Length-Width Measurements^a

	T1, Mean $\pm$ SD			T2, Mean $\pm$ SD			T3, Mean $\pm$ SD		
	Class I Side	Class II Side	<i>P</i>	Class I Side	Class II Side	<i>P</i>	Class I Side	Class II Side	<i>P</i>
Upper									
U1-MR	4.22 $\pm$ 0.71	4.16 $\pm$ 0.62	NS	4.20 $\pm$ 0.42	4.24 $\pm$ 0.51	NS	4.21 $\pm$ 0.39	4.23 $\pm$ 0.42	NS
U2-MR	10.89 $\pm$ 0.89	11.03 $\pm$ 0.93	NS	11.19 $\pm$ 0.60	11.25 $\pm$ 0.55	NS	11.23 $\pm$ 0.57	11.20 $\pm$ 0.60	NS
U3-MR	16.82 $\pm$ 1.28	16.93 $\pm$ 1.37	NS	17.45 $\pm$ 0.92	17.40 $\pm$ 0.88	NS	17.41 $\pm$ 0.86	17.37 $\pm$ 0.93	NS
U4-MR	20.91 $\pm$ 1.57	21.10 $\pm$ 1.72	NS	22.35 $\pm$ 1.31	22.28 $\pm$ 1.42	NS	22.27 $\pm$ 1.25	22.21 $\pm$ 1.38	NS
U5-MR	23.87 $\pm$ 1.62	23.63 $\pm$ 1.57	NS	25.29 $\pm$ 1.29	25.40 $\pm$ 1.37	NS	25.12 $\pm$ 1.43	25.19 $\pm$ 1.52	NS
U6MB-MR	27.45 $\pm$ 1.82	27.18 $\pm$ 1.64	NS	29.04 $\pm$ 1.53	29.18 $\pm$ 1.47	NS	28.89 $\pm$ 1.50	28.92 $\pm$ 1.47	NS
U6DB-MR	27.92 $\pm$ 1.73	28.07 $\pm$ 2.02	NS	29.62 $\pm$ 1.49	29.81 $\pm$ 1.52	NS	29.31 $\pm$ 1.53	29.27 $\pm$ 1.62	NS
Arch length	68.79 $\pm$ 3.78			71.38 $\pm$ 3.42			71.16 $\pm$ 3.71		
Lower									
L1-MR	2.51 $\pm$ 0.42	2.47 $\pm$ 0.50	NS	2.54 $\pm$ 0.38	2.50 $\pm$ 0.41	NS	2.51 $\pm$ 0.44	2.52 $\pm$ 0.51	NS
L2-MR	7.49 $\pm$ 0.61	7.68 $\pm$ 0.54	NS	8.03 $\pm$ 0.55	8.10 $\pm$ 0.48	NS	7.97 $\pm$ 0.48	8.01 $\pm$ 0.53	NS
L3-MR	12.78 $\pm$ 0.83	13.82 $\pm$ 0.97	*	13.92 $\pm$ 0.68	13.90 $\pm$ 0.72	NS	13.88 $\pm$ 0.72	13.81 $\pm$ 0.65	NS
L4-MR	15.43 $\pm$ 0.98	16.92 $\pm$ 1.06	*	17.23 $\pm$ 0.74	17.19 $\pm$ 0.81	NS	17.13 $\pm$ 0.73	17.07 $\pm$ 0.81	NS
L5-MR	18.78 $\pm$ 1.19	19.21 $\pm$ 1.20	NS	19.38 $\pm$ 0.92	19.42 $\pm$ 0.89	NS	19.14 $\pm$ 0.99	19.23 $\pm$ 0.94	NS
L6MB-MR	21.34 $\pm$ 1.41	21.90 $\pm$ 1.33	NS	23.09 $\pm$ 1.29	23.16 $\pm$ 1.34	NS	22.97 $\pm$ 1.18	22.95 $\pm$ 1.32	NS
L6DB-MR	22.77 $\pm$ 1.39	22.91 $\pm$ 1.54	NS	24.12 $\pm$ 1.32	24.15 $\pm$ 1.43	NS	23.89 $\pm$ 1.41	23.94 $\pm$ 1.52	NS
Arch length	59.75 $\pm$ 3.20			61.82 $\pm$ 2.89			61.67 $\pm$ 2.98		

^a NS indicates statistically not significant.* $P < .05$.

In fixed functional treatment using appliances such as Forsus and Herbst, the mandibular incisors were intruded and protruded.^{13,17} One limitation of the present study was that only models were used instead of models plus cone-beam computed tomography (CBCT) images. When the patients in this study were treated, it was considered unethical to take CBCTs for every patient. Therefore, CBCTs were not available for

this population, and the study was designed using only models.

The small sample size and lack of a control group could be limitations of this study. Also, the retrospective nature of this study made it dependent on the accuracy and availability of orthodontic records. Because the use of patients with Class II subdivision malocclusions as controls would be unethical, the

Table 5. Statistical Comparisons of Absolute Differences Between Horizontal Measurements of Upper and Lower Bilateral Dental Landmarks and Arch Length-Width Measurements^a

	Post Hoc Comparison							
	Sign One Way		T1-T2		T1-T3		T2-T3	
	Class I Side	Class II Side	Class I Side	Class II Side	Class I Side	Class II Side	Class I Side	Class II Side
Upper								
U1-MR	NS	NS	NS	NS	NS	NS	NS	NS
U2-MR	NS	NS	NS	NS	NS	NS	NS	NS
U3-MR	NS	NS	NS	NS	NS	NS	NS	NS
U4-MR	*	*	*	*	*	*	NS	NS
U5-MR	*	*	*	*	*	*	NS	NS
U6MB-MR	*	*	*	*	*	*	NS	NS
U6DB-MR	*	*	*	*	*	*	NS	NS
Arch length	*		*		*		NS	
Lower								
L1-MR	NS	NS	NS	NS	NS	NS	NS	NS
L2-MR	NS	NS	NS	NS	NS	NS	NS	NS
L3-MR	*	NS	*	NS	*	NS	NS	NS
L4-MR	*	NS	*	NS	*	NS	NS	NS
L5-MR	NS	NS	NS	NS	NS	NS	NS	NS
L6MB-MR	*	*	*	*	*	*	NS	NS
L6DB-MR	*	*	*	*	*	*	NS	NS
Arch length	*		*		*		NS	

^a NS indicates statistically not significant.* $P < .05$.

Class I sides of the patients were used as the controls. This was the first study on the long-term efficacy of treatment of Class II subdivision patients using asymmetric Forsus appliances. Therefore, it was not possible to compare the results with those of prior studies. Further clinical trials are needed to further evaluate the long-term outcomes.

CONCLUSION

- Class II subdivision malocclusion treatment using the asymmetric Forsus yielded good occlusal correction outcomes. In addition, no relapse was observed over a 4-year retention period. Within the limitations of this study, the results indicate that the asymmetric Forsus is an effective treatment option for patients with Class II subdivision malocclusions.

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