



Comparison of the Effects of Three Different Treatment Modalities on Dental Arch Dimensions in Skeletal Class II Malocclusion – A Cross-Sectional Study

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Objective

To compare the dentoalveolar widths and buccolingual inclinations in class II patients treated with Clark's twin block appliance (CTB), non- extraction (NE) and upper premolars extraction (U4) treatment modalities

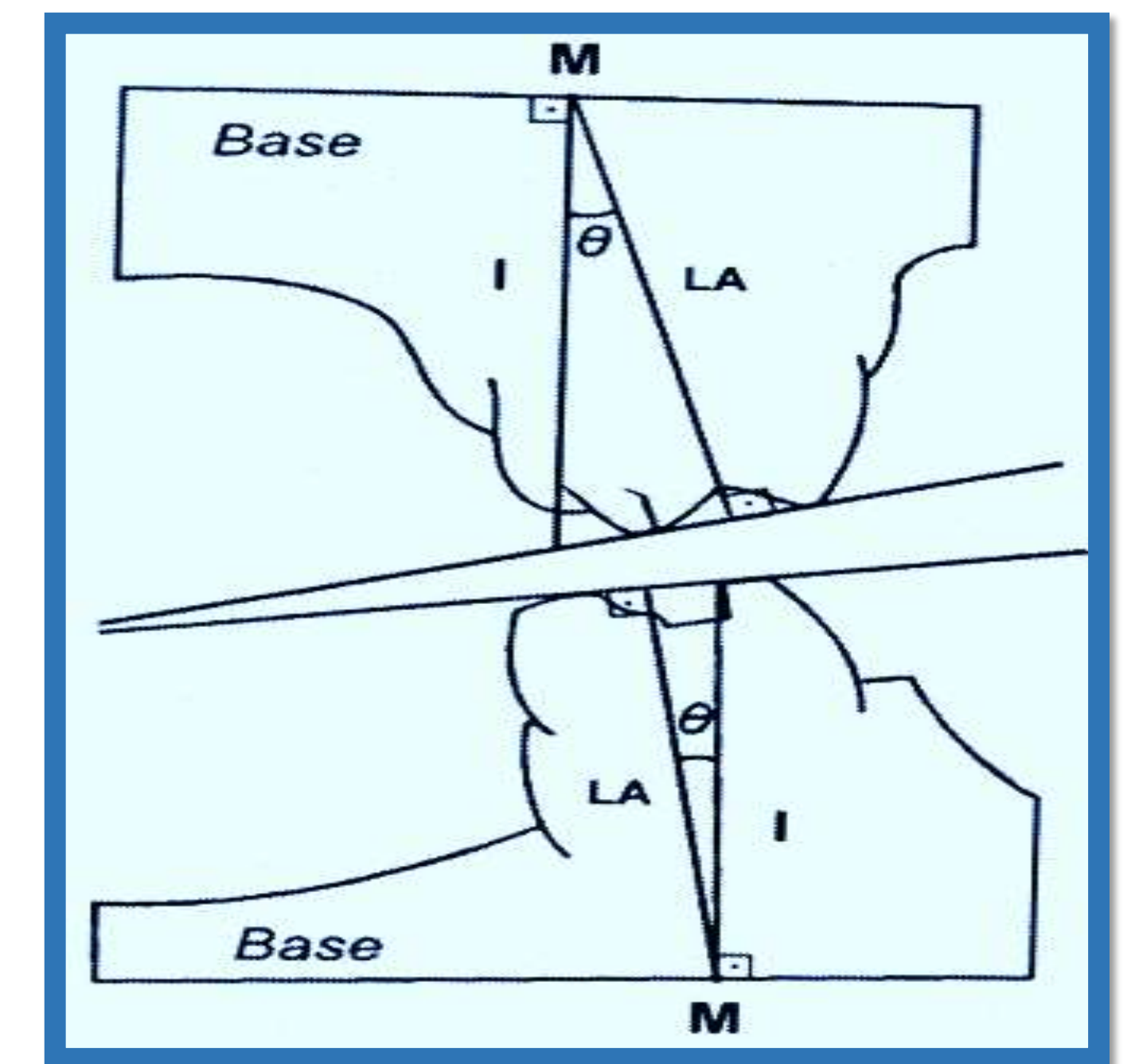
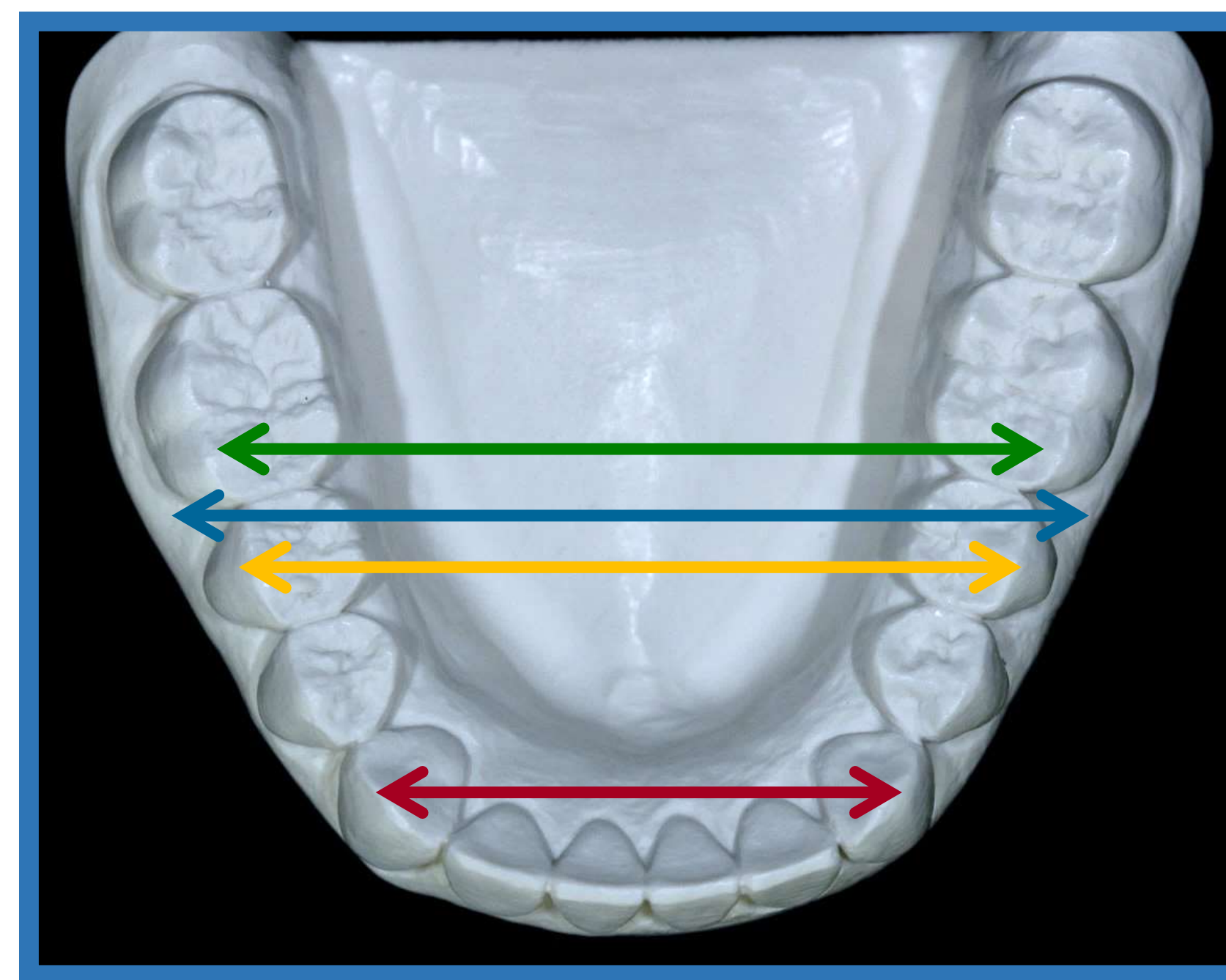
Materials and Methods

Inclusion Criteria

- Class II malocclusion
- Standardized pre- and post-treatment dental casts
- Patients aged between 10-35 years
- Patients completing full course of treatment

Exclusion Criteria

- Past orthodontic treatment
- History of trauma to the maxillofacial structures
- Clefts or craniofacial developmental defects



Buccolingual inclinations (BL)

Results

Groups	CTB		NE		U4	
	Pre (Mean ± SD)	Post (Mean ± SD)	Pre (Mean ± SD)	Post (Mean ± SD)	Pre (Mean ± SD)	Post (Mean ± SD)
UA-IC	33.93 ± 2.29	35.62 ± 1.42	33.17 ± 2.41	32.19 ± 1.25	33.39 ± 0.88	30.27 ± 4.91
UA-IP	43.33 ± 2.98	45.74 ± 2.31	45.17 ± 1.50	44.56 ± 2.12	43.29 ± 0.89	40.68 ± 1.65
UA-IM	48.31 ± 4.45	50.61 ± 2.83	49.80 ± 2.53	50.22 ± 2.21	47.96 ± 1.37	45.71 ± 2.52
UA-IA	51.54 ± 4.33	54.27 ± 3.08	52.30 ± 2.03	52.78 ± 1.91	52.80 ± 1.55	50.14 ± 1.45
UA-BI	-12.22 ± 0.49	-10.36 ± 6.21	-13.84 ± 1.12	-13.62 ± 0.98	-13.45 ± 0.89	-13.14 ± 0.86
LA-IC	26.52 ± 1.80	26.53 ± 1.39	25.85 ± 1.74	25.14 ± 1.39	27.89 ± 0.47	30.29 ± 2.46
LA-IP	38.61 ± 2.07	39.75 ± 2.14	36.84 ± 2.24	37.11 ± 1.97	39.26 ± 0.44	40.34 ± 1.23
LA-IM	44.90 ± 3.23	45.84 ± 3.27	42.31 ± 2.46	43.41 ± 1.90	45.22 ± 1.96	48.15 ± 0.52
LA-IA	49.96 ± 3.47	51.87 ± 2.90	47.97 ± 2.00	48.07 ± 1.78	49.64 ± 1.50	53.69 ± 1.50
LA-BI	-24.59 ± 0.98	-24.46 ± 0.74	-29.64 ± 1.51	-29.28 ± 1.30	-30.57 ± 0.62	-30.50 ± 0.68

Variables

- Inter-canine width (IC)
- Inter-premolar width (IP)
- Inter-molar width (IM)
- Alveolar width (IA)

Design: Cross-sectional study
Sample Size: 45
Groups: CTB, NE & U4

Data Analysis:

Intra- class Correlation
Shapiro-Wilk Test
Paired t-test
One-way ANOVA
Post-hoc Tukey

Groups	Mean Age ± SD
Males (n = 13)	14.57 ± 3.43
Females (n = 32)	20.22 ± 7.36
Sample (N = 45)	18.59 ± 6.93

Paired t-test

Pairwise Comparison

Variables	CTB vs NE	CTB vs U4	NE vs U4
UA-IC-1	0.01*	≤0.001**	0.20
UA-IP-1	0.27	≤0.001**	≤0.001**
UA-IM-1	0.90	≤0.001**	≤0.001**
UA-IA-1	0.18	≤0.001**	≤0.001**
UA-BI-1	0.04*	0.10	0.93
LA-IC-1	0.10	≤0.001**	≤0.001**
LA-IP-1	≤0.001**	0.65	≤0.001**
LA-IM-1	0.01*	0.01*	≤0.001**
LA-IA-1	≤0.001**	0.06*	≤0.001**
LA-BI-1	≤0.001**	≤0.001**	≤0.001**

Conclusions

- Least changes in the transverse dimensions were seen in the lower arch with CTB treatment
- NE group showed mild changes between both the upper and lower arches
- Greatest increase in the lower arch dimensions were seen in U4 group