



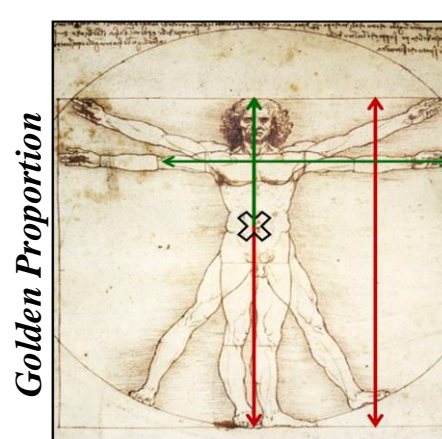
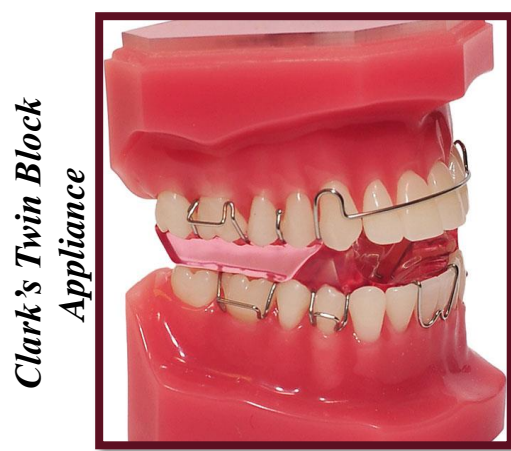
Analysis of Facial Proportions in Skeletal Class II Subjects Treated with Clark's Twin Block Appliance Therapy

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Objectives

- To assess the changes in facial proportions before and after CTB appliance therapy in skeletal class II subjects
- To determine the influence of CTB appliance therapy in achieving golden proportion in post-treatment facial profile outcomes

Materials and Methods



Ricketts 13 Facial Proportion Ratios

| | |
|----|---|
| 1 | Corpus axis length (SPq to Xi); Condylar axis length (Xi to Co) |
| 2 | Anterior cranial base length (CC to Ni); Posterior cranial base length (CC to Ar) |
| 3 | Length of the hard palate (ANS to PNS); Distance from PNS to the posterior border of the mandible |
| 4 | Distance from A to the anterior border of the mandible; Distance from the anterior border of the mandible to the outline of the pharynx |
| 5 | Anterior length of FH (PY to Or); Distance from PY to the glenoid fossa |
| 6 | Facial axis length (Co to Go); Posterior facial height (CC to Go) |
| 7 | Lower facial axis (Go to ANS-Xi line); Upper facial axis (ANS-Xi line to CC) |
| 8 | Distance from SPq to A; Distance from A to FH |
| 9 | Distance from Me to the palate of the incisive canal; Distance from the palate of the incisive canal to external canthus of eye |
| 10 | Distance from SPq to H; Distance from H to A |
| 11 | Sella-Nasion (SN); Sella-Basion (SB) |
| 12 | Ramus height (R3 to R4); Ramus depth (R1 to R2) |
| 13 | PY to the mesial of the mandibular first molar; Mesial of the mandibular first molar to H |

Results

Pre- & Post-treatment Comparison

| Variables | Pre-treatment (Mean ± SD) | Post-treatment (Mean ± SD) | p-value |
|-----------|---------------------------|----------------------------|---------|
| Ratio 1 | 1.649 ± 0.15 | 1.631 ± 0.16 | 0.324 |
| Ratio 2 | 1.495 ± 0.28 | 1.497 ± 0.17 | 0.958 |
| Ratio 3 | 1.682 ± 0.20 | 1.696 ± 0.18 | 0.652 |
| Ratio 4 | 2.956 ± 1.81 | 2.425 ± 0.75 | 0.020* |
| Ratio 5 | 1.276 ± 0.22 | 1.288 ± 0.20 | 0.679 |
| Ratio 6 | 1.521 ± 0.11 | 1.506 ± 0.12 | 0.341 |
| Ratio 7 | 1.550 ± 0.23 | 0.423 ± 0.18 | 0.147 |
| Ratio 8 | 1.534 ± 0.29 | 1.608 ± 0.31 | 0.114 |
| Ratio 9 | 0.985 ± 0.16 | 1.048 ± 0.24 | 0.041* |
| Ratio 10 | 1.682 ± 0.29 | 1.365 ± 0.21 | 0.001** |
| Ratio 11 | 1.483 ± 0.12 | 1.493 ± 0.13 | 0.520 |
| Ratio 12 | 1.733 ± 0.30 | 1.784 ± 0.35 | 0.163 |
| Ratio 13 | 1.085 ± 0.22 | 1.231 ± 0.35 | 0.013* |

Association of Ricketts' 13 Ratios with Golden Proportion by Simple Linear Regression Model

| Variables | Beta coefficient | 95% Confidence Interval | p-value | R2 |
|-----------|------------------|-------------------------|---------|--------|
| Ratio 1 | 1.566 | 0.160, 2.973 | 0.030 | 0.107 |
| Ratio 2 | -0.215 | -1.036, 0.606 | 0.600 | 0.007 |
| Ratio 3 | 0.212 | -0.962, 1.387 | 0.717 | 0.003 |
| Ratio 4 | 0.267 | 0.167, 0.368 | 0.001 | 0.408 |
| Ratio 5 | -0.088 | -1.136, 0.959 | 0.866 | 0.000 |
| Ratio 6 | -1.022 | -2.981, 0.937 | 0.298 | 0.026 |
| Ratio 7 | 0.499 | -0.504, 1.501 | 0.321 | 0.023 |
| Ratio 8 | 0.849 | 0.099, 1.599 | 0.027 | 0.111 |
| Ratio 9 | 1.654 | 0.348, 2.960 | 0.014 | 0.135 |
| Ratio 10 | -0.024 | -0.827, 0.778 | 0.951 | 0.0001 |
| Ratio 11 | -0.309 | -2.169, 1.552 | 0.740 | 0.003 |
| Ratio 12 | 1.078 | 0.383, 1.774 | 0.003 | 0.189 |
| Ratio 13 | -0.100 | -1.148, 0.949 | 0.849 | 0.0009 |

Association of Ricketts' 13 Ratios with Golden Proportion by Multi-variate Linear Regression Model

| Variables | Beta coefficient | 95% Confidence Interval | p-value | R2 |
|-----------|------------------|-------------------------|---------|-------|
| Ratio 4 | 0.256 | 0.168, 0.344 | 0.000 | 0.540 |
| Ratio 12 | 0.973 | 0.453, 1.492 | 0.000 | |

Inclusion Criteria

- Class II malocclusion
- Standardized orthodontic records
- Patients at CVM stage III & IV
- Patients treated with CTB

Exclusion Criteria

- Past orthodontic treatment
- History of trauma to the maxillofacial structures
- Craniofacial developmental defects

Design: Retrospective Longitudinal

Setting: AKUH

Duration: August-September 2020

Sampling Technique: Non-probability, consecutive sampling

Sample Size: 44

Data Analysis:

- Shapiro – Wilk Test
- Paired t – Test
- Univariate & Multi-variable Linear Regression Analysis

Conclusions

The ideal golden proportion was not present in most of the facial proportion ratios of skeletal class II subjects both before and after treatment with CTB therapy.

Treatment with CTB appliance was seen to bring an individual's facial proportions closer to the golden proportion, which can contribute to improving their facial esthetics.

Golden proportion can be used as a guide in treatment planning of individuals requiring CTB, however this may not be the only factor associated with successful treatment outcomes.