A COMPARATIVE EVALUATION OF HERBST APPLIANCE AND THE ADVANCE SYNC 2 IN THE TREATMENT OF CLASS II MALOCCLUSION

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**Abstract**

**Background D And Objectives:** Treatment of class II malocclusion has been a prime focus of orthodontic investigators for decades. Objectives: To evaluate the effects of Herbst fixed functional appliance in the treatment of class II malocclusion, to evaluate the effects of Advansync 2 fixed functional appliance in the treatment of class II malocclusion, to compare the effects of Herbst and Advansync 2 fixed functional appliances in the treatment of class II malocclusion

**Method:** The sample size consisted of 14 patients who reported to department of orthodontics and dentofacial orthopedics, Coorg institute of dental sciences, Virajpet seeking fixed orthodontic treatment. The patients were divided into two groups: Group A: 7 patients who were treated with Herbst fixed functional appliance. Group B: 7 patients who were treated with Advansync 2 fixed functional appliance. The effects of appliances were measured at two intervals T0 – At the beginning of the treatment T1 - Nine months after appliance delivery

**Results:** Patients who were treated with the Advansync 2 fixed functional appliances had better CO- GN, CO- GO, and UI A after the nine months of appliance delivery. Patients who were treated with the Herbst fixed functional appliances had better SNA, SNB, WITZ, CO-A, ANB, UI- A, LI-B, LI B, UL- EPL, and FMA after the nine months of appliance delivery. INTERPRETATION AND CONCLUSION: Advansync 2 and Herbst appliance was effective in normalizing Class II malocclusions.

**Introduction:** Treatment of class II malocclusion has been a prime focus of orthodontic investigators for decades. Class II malocclusions occur in 23% of children aged 8 to 11 years, 15% of youths aged 12 to 17 years, and 13% of adults aged 18 to 50 years, thereby making it the most prevalent skeletal disorder encountered in all age groups. Numerous treatment modalities have been developed to correct Class II malocclusions. These include selective extract
Class II malocclusions represent a disproporionate relationship between the upper and lower teeth. The skeletal, dentoalveolar and soft tissue effects of the AdvanSync® appliance in the correction of Class II malocclusions in growing patients and the need for patient cooperation. 6

There are many ways to treat Class II malocclusions which includeremovable and fixed functional appliances, elastics, extractions, headgear, implants; and even surgery. Suppliers and orthodontists have been creating more and more fixed Class II correcting appliances to limit reliance on patient compliance that is faking, can lead to longer treatment times and less than ideal treatment outcomes. In most cases these appliances can remove the fear of surgery and maintain the patient’s desire to maintain their teeth. Some allow concurrent treatment with comprehensive fixed therapy. There may be some side effects from these appliances and notably lower incisor flaring. From those listed, the one we were the Forsus and AdvanSync, which both allow concurrent treatment, and both have thought to have similar side effects. 12

Fixed or removable functional appliances are designed to alter the position of the jaws both sagittally and vertically, resulting in orthopedic and orthodontic changes. Although the effects of some fixed functional appliances such as the Herbst and mandibular reposepositioning appliance (MARA) have been well documented in the literature, the effects of the AdvanSync appliance (Ormco, Glendora, Calif.) are not well understood. This fixed functional appliance consists of crowns cemented to the maxillary and mandibular permanent first molars, which are connected by telescoping rods. The AdvanSync was designed to allow for simultaneous use of conventional edgewise appliances since the crowns have 0.022” x 0.028” slots. The telescoping mechanism acts to constantly posture the mandible forward upon closure, with the goal of enhancing mandibular growth to correct the Class II malocclusion.

Many of the earlier methods for treatment of Class II patients typically involved removable compliance-based modalities such as removable functional appliances and intermaxillary Class II elastics. Over time, lack of patient compliance and the desire to produce more predictable results in a more efficient manner led to the development of numerous fixed appliances, which did not require patient compliance or fixed therapy. There are advantages and disadvantages for each type of appliance and the orthodontist must choose the most appropriate modality for each individual patient. 14

With the constant arrival of new techniques and appliances, orthodontists are now equipped with more options than ever before but have the responsibility to base their treatment decisions on sound evidence. It is crucial for orthodontic appliances to be thoroughly investigated to fully understand their true effects. Appliances designed to correct Class II malocclusions provide their effect through a combination of skeletal and dentoalveolar changes (McSherry et al., 2000). Understanding the specific skeletal and dentoalveolar effect of each appliance is vital to proper appliance selection based on individual patient requirements.

AdvanSync® is a fixed appliance developed by Ormco® to treat Class II malocclusions. The appliance consists of crowns cemented to permanent upper and lower first molars, which are connected by telescoping rods. The AdvanSync was designed to allow for simultaneous use of conventional fixed orthodontic appliance treatment, as the crowns are equipped with 0.022” x 0.028” slots; this has been claimed to reduce overall treatment time. AdvanSync® is meant to posturally mandible forward and therefore can be classified as a fixed functional appliance. According to Ormco®, AdvanSync® produces stable orthopedic change by skeletal advancement of the mandible, while eliminating the need for patient compliance. 22

Therefore, the purpose of this study was to evaluate the skeletal, dentoalveolar and soft tissue effects of the AdvanSync® appliance and Herbst appliance in the correction of Class II malocclusions in growing patients and to compare the effect of Herbst and AdvanSync® fixed functional appliances.
Aims and Objectives:
The present study was conducted with the following aims and objectives.
1. To evaluate the effects of Herbst fixed functional appliance in the treatment of Class II malocclusion
2. To evaluate the effects of AdvanSync fixed functional appliance in the treatment of Class II malocclusion
3. To compare the effects of Herbst and AdvanSync fixed functional appliances in the treatment of Class II malocclusion

Methods And Methodology:
The sample size consisted of 14 patients who reported to the department of orthodontics and dentofacial orthopedics, seeking fixed orthodontic treatment.

Procedure:
The patients were divided into two groups:
1. Group A: 7 patients who were treated with Herbst fixed functional appliance
2. Group B: 7 patients who were treated with AdvanSync2 fixed functional appliance

Pre-treatment and post functional lateral cephalograms were taken. All the digital radiographs were taken using SIRONA (ORTHOPHOS XG5) with the same operator. To standardize the radiographs, all magnifications were corrected to 0%. One investigator drew all the tracings and measurements. In both the groups, fixed orthodontic treatment was started only at the end of fixed functional phase. Following the active phase of the treatment, the fixed functional appliance was removed only after a minimum of three-month retention period.

The effects of appliances were measured at two intervals
1. T₀ – At the beginning of the treatment
2. T₁ - Nine months after appliance delivery

The data was collected, coded, and fed in SPSS (IBM Version 23) for statistical analysis. The descriptive statistics included mean & standard deviation. Inferential statistics included paired t-test & Independent t Test for the comparison. The level of significance was set at 0.05 at 95% confidence interval.

Results:
The descriptive statistics done using SPSS (IBM SPSS Statistics for Windows, Version22.0, Armonk, NY: IBM Corp. Released 2013) included mean & standard deviation. The inferential statistics included independent t test, and paired t test. Independent t test was used to compare the mean of two unrelated independent groups. Paired t test was used to compare the difference between two sets of values of a parameter from the same subjects. The level of significance was set at 0.05 at 95% Confidence Interval.

Advansync2 Fixed Functional Appliance:
In the patients treated with Advansync2 fixed functional appliances, the mean of the cephalometric readings before and after the treatment were recorded (Table 1 & Graph 1).

| ADVSYNC | MEAN | Standard Deviation | MEDIAN | Z   | SIG.    |
|---------|------|--------------------|--------|-----|---------|
| SNA     | PRE  | 83.1429            | 5.72796| 80  | -2.043  | 0.041(S) |
|         | POST | 78.7143            | 6.57557| 81  |         |         |
| SNB     | PRE  | 77.8571            | 4.8107 | 77  | -1.364  | 0.172(N.S) |
|         | POST | 75.7143            | 6.1837 | 76  |         |         |
| WITZ    | PRE  | 5                  | 1.82574| 4   | -2.388  | 0.017(S) |
|         | POST | 0.5714             | 1.61835| 1   |         |         |
| CO-A    | PRE  | 87                 | 2.70801| 86  | -2.388  | 0.017(S) |
|         | POST | 83.5714            | 4.23703| 82  |         |         |
| CO-GN   | PRE  | 107.857            | 4.09994| 107 | -2.388  | 0.017(S) |
|         | POST | 111.714            | 2.9277 | 111 |         |         |
| CO-GO   | PRE  | 61.2857            | 6.77531| 62  | -1.342  | 0.180(N.S) |
|         | POST | 70.5714            | 17.98941| 65 |         |         |
Table 1: Comparison of effects of Advansync2 fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.

| ANB  | PRE   | 5.2857 | 2.05866 | 5 | -2.414 | 0.016(S) |
|------|-------|--------|---------|---|--------|----------|
| POST | 3     | 1.1547 | 3       |   |        |          |
| UI-A | PRE   | 28.4286| 7.61265 | 27| -1.703 | 0.089(N.S)|
| POST | 25.1429| 7.53721| 22     |   |        |          |
| UIA  | PRE   | 6      | 3.41565 | 5 | 0      | 1.000(N.S)|
| POST | 6     | 3.41565| 5       |   |        |          |
| LI-B  | PRE   | 29    | 6.90411 | 25| -2.388 | 0.017(S) |
| POST  | 36.5714| 5.8838 | 32     |   |        |          |
| LIB   | PRE   | 5.1429| 2.67261 | 5 | -1     | 0.317(N.S)|
| POST  | 5.2857| 2.62769| 5      |   |        |          |
| UL-EPL | PRE  | -1.1429| 2.54484 | -1| -1.656 | 0.098(N.S)|
| POST  | -2    | 3.26599| -1     |   |        |          |
| FMA   | PRE   | 24.2857| 5.12231 | 24| -0.68  | 0.496(N.S)|
| POST  | 25.5714| 2.37045| 25     |   |        |          |

Graph 1: Comparison of effects of Advansync2 fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.

The C0-GN, C0-GO, LI-B (angular), LI-B (linear) and FMA values were found to have improved after nine months of the Advansync2 fixed functional appliance delivery. On the contrary SNA, SNB, WITZ, CO-A, ANB, UI-A, UI-A, LI-B, LIB, UL-EPL values were found to have improved after nine months of the Advansync2 fixed functional appliance delivery.
ANB, UI – A and UL - EPL values were reduced after nine months of the Advansync2 fixed functional appliance delivery. UI - A showed no difference in their mean values from the beginning of the treatment and nine months after appliance delivery.

P-values were observed to be less than 0.5 for parameters such as SNA, WITZ, CO - A, C0 - GN, ANB and LI - B. Hence, we rejected the null hypothesis and accepted the alternate hypothesis for these parameters. Therefore, for these values the differences from the beginning of the treatment and nine months after appliance delivery were observed to be statistically significant.

P-value for SNB, CO - GO, UI - A, UI - A, LI - B, UL - EPL and FMA was however observed to be greater than 0.5. Hence, we failed to reject the null hypothesis for these parameters. Therefore, for these values the differences from the beginning of the treatment and nine months after appliance delivery were observed to be statistically insignificant.

**Herbst Fixed Functional Appliance:**
In the patients treated with Herbst fixed functional appliances, the mean of the cephalometric readings before and after the treatment were recorded (Table 2 & Graph 2).

| HERBST | MEAN | STANDARDDEVIATION | MEDIAN | Z     | SIG.  |
|--------|------|-------------------|--------|-------|-------|
| SNA    | PRE  | 83.571            | 5.68205| 84    | -2.06 | 0.039(S) |
|        | POST | 81.571            | 4.89412| 81    |       |        |
| SNB    | PRE  | 78                | 5.06623| 79    | -0.135| 0.892(N.S) |
|        | POST | 78.285            | 5.18698| 80    |       |        |
| WITZ   | PRE  | 4.8571            | 2.1157 | 5     | -2.414| 0.016(S) |
|        | POST | 1.63299           | 1      |       |       |        |
| CO-A   | PRE  | 85.285            | 1.97605| 85    | -0.17 | 0.865(N.S) |
|        | POST | 85                | 3.41565| 86    |       |        |
| C0-GN  | PRE  | 105.71            | 3.09377| 106   | -2.032| 0.042(S) |
|        | POST | 108.85            | 4.84522| 111   |       |        |
| C0-GO  | PRE  | 57.857            | 7.75518| 60    | 0     | 1.000(N.S) |
|        | POST | 57.857            | 7.75518| 60    |       |        |
| ANB    | PRE  | 5.5714            | 1.81265| 5     | -2.456| 0.014(S) |
|        | POST | 3.2857            | 2.81154| 3     |       |        |
| UI-A   | PRE  | 26.285            | 7.73982| 23    | -2.56 | 0.798(N.S) |
|        | POST | 27.285            | 6.07493| 26    |       |        |
| UI-A   | PRE  | 5.6429            | 3.0099 | 5     | 0     | 1.000(N.S) |
|        | POST | 5.6429            | 3.0099 | 5     |       |        |
| LI-B   | PRE  | 31.428            | 5.38074| 32    | -2.379| 0.017(S) |
|        | POST | 37.857            | 4.67007| 39    |       |        |
| LIB    | PRE  | 6.4286            | 2.1492 | 5     | -0.577| 0.564(N.S) |
|        | POST | 6.2857            | 1.60357| 5     |       |        |
| UL-EPL | PRE  | 0.1429            | 1.21499| 1     | -0.447| 0.655(N.S) |
|        | POST | 0                | 1.52753| 1     |       |        |
Table 2: Comparison of effects of Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.

| Parameter | PRE | POST | FMA  |
|-----------|-----|------|------|
|           |     |      |      |
|           | 26  | 26.4286 | 7.72442 | 27 | -0.137 | 0.891(N.S) |

SNB, C0 - GN, UI - A, LI - B and FMA was found to have increased after nine months of the Herbst fixed functional appliance delivery. On the contrary, SNA, WITZ, CO - A, ANB, LI - B and UL - EPL were decreased after nine months of the Herbst fixed functional appliance delivery. C0 - GO and UI - A had no difference in their mean values from the beginning of the treatment and nine months after appliance delivery.

P-values was observed to be less than 0.5 for parameters such as SNA, WITZ, C0-GN, ANB, and LI-B. Hence, we rejected the null hypothesis and accepted the alternate hypothesis for these parameters. Therefore, for these values the differences from the beginning of the treatment and nine months after appliance delivery were observed to be statistically significant.

P-value for SNB, CO - A, C0 - GO, UI - A, UI - A, LI - B, UL - EPL and FMA was however observed to be greater than 0.5. Hence, we failed to reject the null hypothesis for these parameters. Therefore, for these values the differences from the beginning of the treatment and nine months after appliance delivery were observed to be statistically insignificant.

Comparison between Advansync2 and Herbst Fixed Functional appliance:
When readings at the beginning of the treatment were compared between patients who were treated with the Advansync fixed functional appliances and Herbst fixed functional appliance (Table 3A, 3B, 3C & Graph 3A, 3B), patients who underwent treatment with the Advansync fixed functional appliances showed better readings of WITZ, C0 - A, C0 - GN, C0 – GO and UI – A (angular, linear) and patients who underwent treatment with the Herbst fixed functional appliances showed better readings of SNA, SNB, ANB, LI – B (angular, linear) and UL-EPL.
| CO-APRE | ADVSYNC   | MEAN  | STANDARDDEVIATION | MEDIAN | MANNWHITNEYU | Z     | SIG. |
|---------|-----------|-------|-------------------|--------|-------------|-------|------|
| HERBST  | 85.2      | 857   | 1.97605           | 85     | 1.2         | 47    |      |
| CO-APOST| ADVSYNC   | 83.5  | 714               | 82     | 20.5        | 52    |      |
| HERBST  | 85        |       | 3.41565           | 86     |             |       |      |

**Table 3A:** Comparison of effects of Advansync2 fixed functional appliances and Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.

| CO-GNPRE | ADVSYNC   | MEAN  | STANDARDDEVIATION | MEDIAN | MANNWHITNEYU | Z     | SIG. |
|----------|-----------|-------|-------------------|--------|-------------|-------|------|
| HERBST   | 107.8     | 57    | 4.09994           | 107    | 18.5        | -0.7  | 0.75 |
| CO-GNPOST| ADVSYNC   | 111.7 | 14                | 111    | 23.5        | -0.1  | 0.32 |
| HERBST   | 108.8     | 57    | 4.84522           | 111    |             |       |      |
| CO-GOPRE | ADVSYNC   | 61.28 | 57                | 62     | 15.5        | -1.1  | 0.67 |
| HERBST   | 57.85     | 71    | 7.75518           | 60     |             |       |      |
| CO-GOPST | ADVSYNC   | 70.57 | 14                | 65     | 9           | -1.9  | 0.96 |
| HERBST   | 57.85     | 71    | 7.75518           | 60     |             |       |      |
| ANBPRE   | ADVSYNC   | 5.285 | 7                 | 5      | 22          | -0.3  | 0.27 |
| HERBST   | 5.571     | 4     | 1.81265           | 5      |             |       |      |
| ANBPST   | ADVSYNC   | 3     | 1.1547            | 3      | 19          | -0.7  | 0.2  |
| HERBST   | 3.285     | 7     | 2.81154           | 3      |             |       |      |
| UI-APRE  | ADVSYNC   | 28.42 | 86                | 27     | 20          | -0.5  | 0.85 |
| HERBST   | 26.28     | 57    | 7.73982           | 23     |             |       |      |
| UI-APOST | ADVSYNC   | 25.14 | 29                | 22     | 18.5        | -0.7  | 0.73 |
| HERBST   | 27.28     | 57    | 6.07493           | 26     |             |       |      |

**Table 3B:** Comparison of effects of Advansync2 fixed functional appliances and Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.
|                | ADV      | SYNC     | 25 | 29 | 5.41565 | 5 | 23 | 0.844( N.S) | 97 | 5.64 | 3.0099 | 5 | 18 | 0.397( N.S) | 47 | 32 | 0.688( N.S) | 04 | 39 | 0.407( N.S) | 29 | 32 | 0.336( N.S) | 24 | 57 | 0.693( N.S) | 28 | 72 | 0.653( N.S) | 49 |
|----------------|----------|----------|----|----|---------|---|----|-------------|----|------|----------|---|----|----------------|----|-----|----------------|----|-----|----------------|----|-----|----------------|----|-----|----------------|----|
|    UIAPO       | ST       | ADV      | 6  | 29 | 6.90411 | 25| 18 | -            | 0.1| 97      | N.S     | 32 | 14 | N.S            | 23 | 21.5|string                      | 0.394| 0.682 | 0.407 | 0.336 | 0.693 | 0.653 |}

**Table 3C:** Comparison of effects of Adv Sync to fixed functional appliances and Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.
Graph 2: Comparison of effects of Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.
Graph 3A: Comparison of effects of Advansync2 fixed functional appliances and Herbst fixed functional appliances during the beginning of the treatment and nine months after appliance delivery.
At the beginning of the treatment, when P-values of the patients who underwent treatment with the Advansync2 fixed functional appliances and Herbst fixed functional appliances were compared for all the observed factors, P-value was observed to be greater than 0.05 for all the observed factors. Hence, we failed to reject the null hypothesis. Therefore, the difference at the beginning of treatment between these appliances was observed to be statistically insignificant.

After the nine months of appliance delivery, when P-values of the patients who underwent treatment with the Advansync2 fixed functional appliances and Herbst fixed functional appliances were compared, patients who underwent treatment with the Advansync2 fixed functional appliances had better readings of C0 - GN, C0 - GO and UI – A and patients underwent treatment with the Herbst fixed functional appliances had better readings of SNA, SNB, WITZ, CO - A, ANB, UI - A, LI – B (angular, linear), UL - EPL and FMA.

After the nine months of appliance delivery, when P-values of the patients who underwent treatment with the Advansync2 fixed functional appliances and Herbst fixed functional appliances were compared for all the observed factors, P-value was observed to be greater than 0.05 for all the observed factors except C0 - GO. Hence, we failed to reject the null hypothesis for all the observed factors except CO-GO. Therefore, the difference after nine months of appliance delivery between these appliances was observed to be statistically insignificant except CO- GO which was statistically Significant.
Discussion:

This was a retrospective cephalometric study looking at the dental, skeletal, and soft tissue treatment impacts of the AdvanSync2 appliance and Herbst appliance in the treatment of skeletal Class II malocclusions. Our outcomes indicated the 2 treatment modalities delivered comparative impacts with certain special cases.

The maxillary restriction was the major skeletal impact of the AdvanSync2. This concurs with another research by Al-Jewaiaretal. testing the equivalent appliance.5 Al-Jewaiaretal. detailed an overall decrease in SNA of 3°. A reduction in A-Na perp of 3.3 mm, and an increase in maxillary length (Co-A) of 1.8 mm (from natural growth). In another study by SanthoshJayachandran et al., SNA decreased by 2.1°, A-Na perp decreased by 2.0 mm, and Co-A increased by 1.7 mm. In our study, SNA decreased by 4.4°. In all the three studies, overall mandibular and vertical skeletal changes with AdvanSync didn’t vary vastly from the untreated controls.3,5 Maxillary limitation has been shown with the Herbst and the MARA, yet they can enhance mandibular growth too.4

Maxillary dentoalveolar changes with the AdvanSync in our investigation were like the past examination, with no critical changes contrasted with the untreated controls (except for a slight incisor extrusion, undoubtedly because of fixed appliance mechanics).4 Mandibular dentoalveolar changes were additionally reliable with the past investigation, with the AdvanSync patients displaying incisor protrusion and proclination and molar mesialization contrasted with their separate control groups.4 However, Al-Jewaiaretal. revealed that mandibular molar extrusion with AdvanSync contrasted with the controls; this was not found in our examination.4 This might be credited to differences in the fixed appliance mechanics utilized. The noticed dentoalveolar changes with the AdvanSync were predictable generally with those detailed in investigations including the Herbst and the MARA.3,5

The results of the investigation by McNamarashow ed that the pubertal growth spurt, in the permanent dentition, is the most good time frame to achieve am ore noteworthy amount of mandibular skeletal impacts and a more modest measure of dentoalveolar compensation at the lower arches for pre- or post-top periods.15 Treatment with MARA and fixed appliances at a pre-peak development stage had the option to prompt ideal results at the degree of the maxillary skeletal structure that gave a more modest amount of sagittal advancement and length when contrasted with untreated Class II control information.2 The so-called ‘headgear-effect’ that has been depicted as a potential impact of the Herbst appliance (Hansen et al. 1991; Pancherz and Hägg, 1985) was found additionally in patients treated with the MARA before puberty. Baccetti et al. found in his study that the pre-pubertal phase of development in presence of residual sutural action of the maxillary skeletal structure took into consideration the ideal result in the maxilla, consequently affirming previous observations in a sample treated with the headgear, fixed appliances, and Class II elastics at the same stage in skeletal maturation. The early treatment group demonstrated some huge changes in the vertical parameters with a reduction in the intermaxillary skeletal divergence checked by a lot of decrease in the overbite (~3.1 mm on average when contrasted with controls).15 Regarding the dentoalveolar level, the huge adjustments were situated at the lower arch with proclination of the lower incisors. The absence of sagittal support because of the loss of the lower second deciduous molars, which was regular at some phase of the treatment in pre-peak patients, was just somewhat balanced by the fixed appliance and the thick lingual arch connecting the molar bands.15 This may have represented the extrusion and mesialization of the lower first molars. These impacts are fundamentally the same as those depicted by Baccetti et al. after the utilization of Class II elastics in combination with fixed appliances.15

A limitation of this retrospective study is that only two time points before the treatment phase and nine months after functional appliance removal was included. Therefore, the long-term effects could not be investigated. A time point at fixedorthodontic treatment should have been recorded. There are also inherent limitations with the use of a small data base to compare the effects of Herbst and AdvanSync 2 fixed functional appliances in the treatment of Class II malocclusion.

Unmistakably, the various appliances have different treatment impacts, consequently various indications. As indicated by our study and that of Al-Jewaiaretal., patients requiring restriction of maxillary growth and proclination and protrusion of mandibular incisors, while keeping up the vertical growth pattern, appear to be unmistakably appropriate for AdvanSync treatment. Thusly, growing patients with askeletal Class II malocclusion brought about by maxillary prognathism who can afford mesialization of the mandibular dentition are the prime possibility for AdvanSync.
treatment. As indicated by McNamara et al., maxillary prognathism isn't normal with skeletal Class II malocclusion. Accordingly, patients who in a perfect condition match the prerequisites for AdvanSync treatment appear to be more uncommon. In patients with skeletal Class II malocclusions because of mandibular retrognathism (most common) it appears to be more proper to utilize an appliance that can enhance mandibular development, for example, the Herbst orthoMARA. The Herbst appliance is shown in the treatment of maxillary prognathism, mandibular retrognathism (or blends), amplified sagittal inter-maxillary ANB angle, the retrusion of lower or protrusion of upper incisors (or mixes), and mild to moderate crowding of the upper dental arch. Therapy with this appliance could be a decent decision rather than camouflage orthodontics, growth adaptation with removable appliances or orthognathic medical procedure. We restricted our study to fixed functional appliances, Herbst and AdvanSync; numerous different modalities are accessible. Usually, appliances should be chosen for their probability of satisfying the individual patient necessities dependent on sound evidence.

The result of this study can be used to fulfill the following clinically relevant objectives:
1. Help the clinician decide whether to apply the Herbst fixed functional appliance in the treatment of class II malocclusion.
2. Help the clinician decide whether to apply the AdvanSync fixed functional appliance in the treatment of class II malocclusion.
3. Help the clinician to assess and evaluate effects of Herbst in the treatment of class II malocclusion.
4. Help the clinician to assess and evaluate AdvanSync in the treatment of class II malocclusion.
5. Help the clinician compare the effects of Herbst and AdvanSync fixed functional appliances in the treatment of class II malocclusion.

Conclusion:
The following footprints were laid out within the bounds of this study:
1. AdvanSync2 and Herbst appliance were effective in normalizing Class II malocclusions.
2. AdvanSync2 corrected Class II malocclusion through CO-GN, C0-GO, and UI-A.
3. Herbst appliance corrected Class II malocclusions primarily through SNA, SNB, WITZ, CO-A, ANB, UI-A, LI-B, LIB, UL-EPL, and FMA.

Fig 1 (Herbst Case): Pre-treatment Extraoral Photographs (A, B, C & D) with VTO (E)
Fig 2: Pre functional Intraoral Photographs (Herbst Case)
Fig 3: Herbst appliance Intraorally
Fig 4: Post Functional Extraoral (Herbst Case)
Fig 6: A-Pre and B-Post functional Lateral Cephalogram (Herbst Case)

Fig 7 (Advansync2 Case): Pre-treatment Extraoral Photographs (A,B,C&D) with VTO(E)
Fig 9: Advansync2 appliance Intraorally
Fig 10: Post Functional Extraoral (Advansync2 Case)
Fig 11: Post Functional Intraoral (Advansync2 Case)
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