Herbst Fixed Functional Treatment for a Severe Class II

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Introduction

This case report presents the treatment of a patient with a significant skeletal and dental Class II relationship. We’ve all read the review articles and meta-analyses that suggest that functional appliances don’t grow mandibles. Assuming this is true, what role does the fixed functional have in modern-day orthodontics? What do we do when faced with a significant Class II that has both skeletal and dental components?

Some have suggested waiting until growth is completed and then treating surgically or with extractions. Others will employ Class II elastics, distalization, TADs or any number of Class II correction devices. Ultimately these all can achieve similar results and it boils down to a practice management and efficiency decision. I would argue that the Herbst appliance still has a place in the modern orthodontic practice and can be used in an effective and efficient manner to aid Class II correction without the need for patient cooperation (at least in terms of placing elastics or a removable appliance).
Diagnosis and treatment plan

A mother brought in her 10-year-old son, who was in the mixed dentition, for an orthodontic consultation. The mother reported a history of trauma to the upper-right central incisor one year earlier, with two subsequent composite restorations to repair the fractured tooth.

Clinical evaluation revealed the fractured and repaired UR1, a severe skeletal and dental Class II relationship with 15mm of overjet, severe maxillary protrusion and a severe deep bite with palatal impingement.

A Phase I treatment with a maxillary 2x4 appliance to retract the upper incisors was discussed, along with Phase II treatment with a Herbst appliance. The mother declined Phase I treatment and the patient was placed in observation until he was 12 years and one month old, at which time treatment was initiated with a Herbst appliance and braces (Figs. 1-3; Fig. 1 on p. 31).

Treatment progress

A cantilever crown Herbst appliance with stainless-steel crowns fitted on upper and lower first molars was cemented, along with .018 (Sondhi Rx, 3M Unitek Mini Uni-Twin) brackets U4-4 and L3-3 (-10 degree brackets place L2-2) with .014 Sentalloy archwires. Initially the patient was advanced to Class I canines and was seen every 10 weeks for adjustments, and the Herbst was advanced until the patient had 2mm of negative overjet, at which time the Herbst arms were removed.

The Herbst was active for a total of 13 months. The remaining teeth were bonded at the Herbst removal appointment. Settling elastics were used for the last two months of treatment. The total active treatment time was 28 months—with 12 adjustment visits, one Herbst delivery, one Herbst removal and one deband appointment—for a total of 15 active visits.

Treatment results

The patient was finished to Class I canines and strong Class I molars with ideal overjet and overbite. Midlines were coincident with each other and the patient’s mid-sagittal plane (Figs. 4-6).

Due to the very thick composite restoration of the UR1, the lingual surface of UR1 was aligned with the UL1 in anticipation...
that the patient would restore the UR1 with a much thinner veneer in the future (Fig. 7, post-restoration). The third molars had only completed crown formation and were not a concern at the deband appointment (Figs. 4-7).

**Discussion**

The patient presented with a 15mm overjet with both skeletal and dental components. Although the current evidence in our evidence-based orthodontic knowledge base suggests we cannot grow larger mandibles than what the patient is genetically predisposed to achieve, we probably are accelerating this growth over a shorter time period. This, coupled with a noncompliance tooth-borne device, can yield some impressive skeletal and dental changes over a relatively short treatment time.

This patient had the genetic potential to achieve a Class I skeletal relationship. Having a Herbst present 24/7 reduced the dental compensation of the upper incisors, added dental compensation to the lower incisors and perhaps condensed mandibular growth into a shorter period of time or borrowed from future mandibular growth. There were many ways this patient could have been treated to the same result. This non-compliance method is both effective and efficient in the private practice setting.

**References**