C.B.

Age: 13 Years – 6 months

Diagnosis: Class I Left, Class II Right – Youth (tooth-guidance case with severe crowding and unilateral crossbite) (Started late due to patient circumstances)

Background:

The following case is a beautiful example of how facial treatment planning should and can be our primary focus. Early in my career, this case would have been extracted without even thinking of the long-term impact on the profile. Today, it is very interesting to observe how aware many patients and parents are of the impact orthodontic care can have on the face. Patients' expectations for an outstanding final result has changed from just straight teeth to desiring a great smile along with improving the profile and facial appearance.

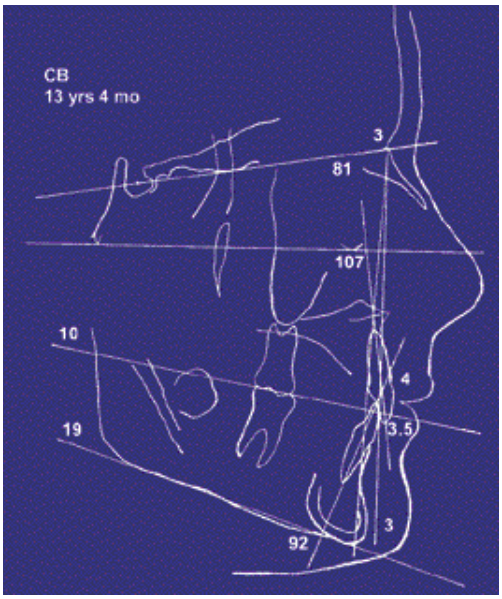
Through improvements in technique and technology, these expectations can be met in a reasonable amount of time with little patient discomfort. The clinician can now treatment plan, thinking of the long-term implications on both profile and face. It is interesting to follow the change in this patient's profile over several years. Think how different this18-year-old profile and face would look had four bicuspids been removed. Given the opportunity, this case should have been started long before the cuspids erupted through tissue. It is so critical to design treatment mechanics that do not overpower the biological system. This is why medium-light NiTi SE springs are only activated 1 to 2 times the width of a bracket. The combination of light activation and length of spring from lateral to molar gives a very gentle constant force. The treatment goal is to use the "lip bumper" effect of the orbicularis oris and mentalis muscles. These muscles are basically our headgear. Note the minimal change in lower incisor position on the composite headfilm tracings.

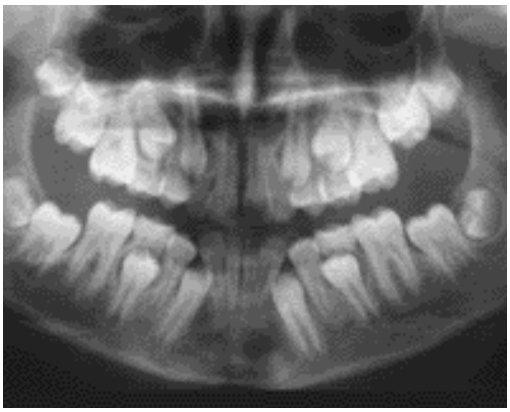
This patient illustrates so clearly how bone can be moved with teeth if the "optimal force" is maintained. Without high-force rapid palatal expansion the maxillary bicuspid width has increased by 11 mm and molar width 14 mm with minimal tipping. Our treatment goal is to place a very light biologic force and then get out of the way and let the orofacial muscle complex, bone, and tissue determine what is going to happen. This is obviously a paradigm shift for most clinicians. The following clinical photographs show how very simple mechanics and a low-force system can achieve an end result that is very heartwarming to patients and parents. What a thrill it was to have Cody's mother call the office and say, "You have created a monster smile, the phone just doesn't stop ringing."

Facial Evaluation:

1. Class I face with severe crowding.
2. Class II dental on right side.
3. Unilateral posterior crossbite.
4. Good nose and chin button.
5. Lack of facial support laterally – frontal view.
6. The nose and chin will change dramatically as the face matures.

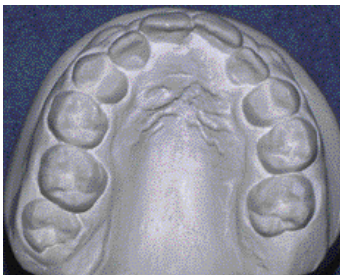
Pretreatment Radiographic Survey:

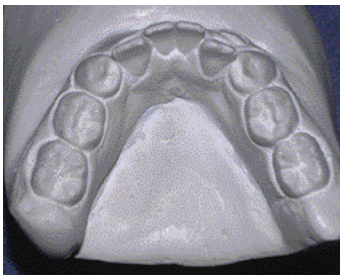


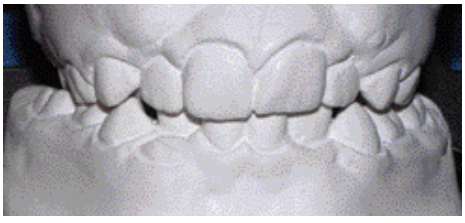


Dentition Evaluation:

1. Severe lack of arch length and width in both arches.
2. Moderate overbite.
3. Cuspids totally blocked to labial in both arches with very thin bone and tissue.
4. Posterior crossbite in molar area.
5. Upper second bicuspid erupting toward palate.
6. Lower third molars tipped anterior.
7. Upper midline left of center.







Treatment Objectives:

Goal: To achieve facial balance and symmetry with a very positive impact on profile. In this case it is absolutely critical to evaluate where this profile will be at 30 years of age. Cody resembles his father, who is tall with a very strong nose and chin.

1. Gain maxillary and mandibular arch length.
2. Establish upper and lower incisor position to give lip support.
3. Establish maxillary and mandibular posterior arch width to support mid-face.
4. Establish ideal maxillary lip-to-tooth relationship.
5. Design treatment mechanics to eliminate need for higher force rapid palatal expansion.
6. With low-force mechanics to work with the orofacial muscle complex, bone, and tissue to establish a physiologic tooth position.

Treatment Sequence:

Special Torques

- Upper centrals +7°, laterals +3° (low torque).
- Lower centrals and laterals -6°.

Start:

1. Banded maxillary and mandibular first molars – bonded central and lateral incisors.
2. Due to alignment of maxillary teeth and interbracket distance, placed an .014 x .025 NiTi SE with medium-light NiTi springs activated 1.5 to 2 times the width of a bracket. It was necessary to gain space due to severe labial position of the cuspids.
3. Placed mandibular .014 NiTi SE sectional archwire – archwire too light to engage molars.



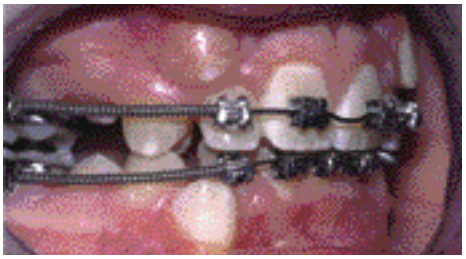


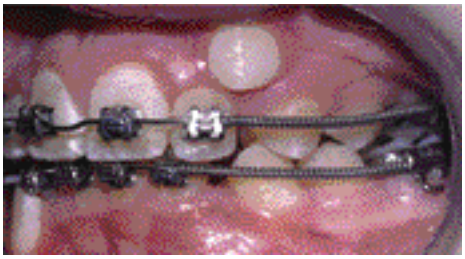
Appt. 1

2 months – 1 week:

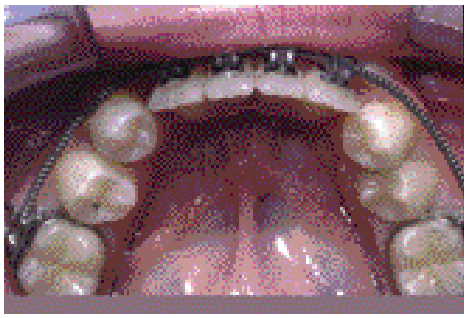
- Placed maxillary and mandibular .016 x .025 NiTi SE. Activated spring 1.5 width of bracket.

Appt. 2
4 months – 1 week:





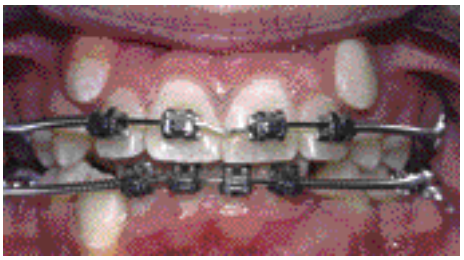
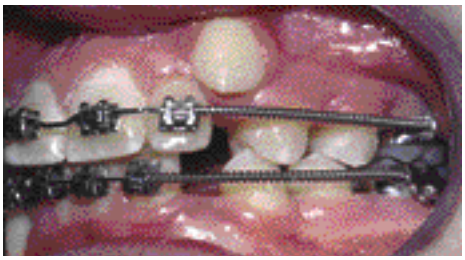
- Check only.

Appt. 3
6 months– 1 week:

- Activated springs.

Appt. 4
8 months:

- Placed maxillary and mandibular .019 x .025 SS.
- Took Panorex to evaluate position of erupting permanent teeth.


Appt. 5
10 months – 2 weeks:

- Adjusted maxillary archwire.

Appt. 6
12 months – 2 weeks:

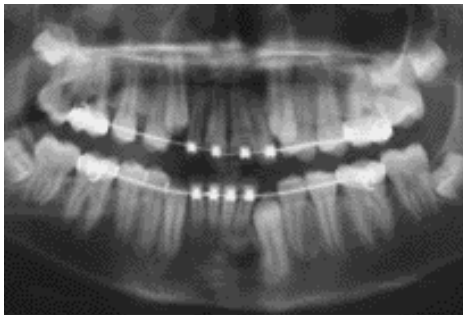
- Bonded maxillary cuspids and first and second bicuspids.
- Placed continuous .014 NiTi SE in maxillary arch.

Appt. 7
14 months – 3 weeks:
- Repositioned maxillary left lateral.
- Waiting on eruption of permanent teeth.

Patient gone for 6 months

Appt. 8
19 months – 3 weeks:
- Bonded mandibular cuspids and first and second bicuspids
- Placed continuous mandibular .014 NiTi SE.
- Placed maxillary .016 x .025 NiTi SE.

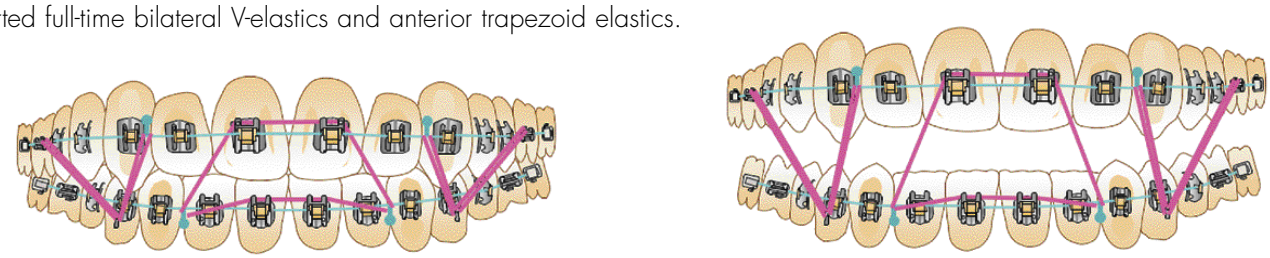
Appt. 9
22 months – 1 week:
- Placed maxillary .019 x .025 S.S. Preposted.
- Placed mandibular .016 x .025 NiTi SE
- Took headfilm.



Appt. 10
24 months – 3 weeks:
- Took Panorex to evaluate root position.
- Adjusted maxillary archwire.

Appt. 11
26 months – 2 weeks:
- Bonded mandibular second molars.
- Placed .016 NiTi SE overlay to engage mandibular second molars.

Appt. 12
29 months:
- Bonded upper second molars.
- Placed maxillary .016 NiTi SE overlay.
- Placed crimpable hooks on .016 x .025 NiTi SE.
- Started full-time bilateral V-elastics and anterior trapezoid elastics.



Bilateral V-elastics with Anterior Trapezoid

Appt. 13
30 months – 3 weeks:
- Adjusted maxillary .019 x .025 preposted archwire; placed mandibular .016 x .025 S.S. preposted. Desired play between archwire and bracket slot for settling.
- Continued bilateral V-elastics full time.

Appt. 14
32 months – 1 week:
- Adjusted maxillary and mandibular archwires.
- Continued V-elastics full time.

Finals
33 months – 2 weeks: Deband upper and lower

Pretreatment

Posttreatment

Pretreatment

Posttreatment

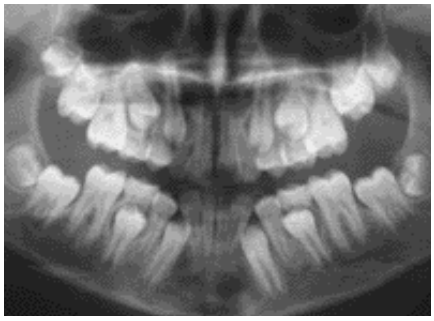
Final

Final

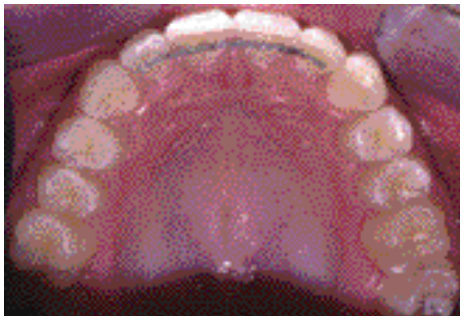
Final

Initial Bonding

Initial Bonding

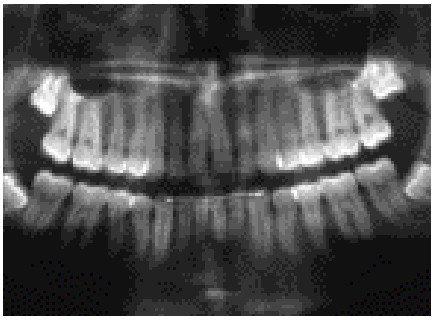


Initial

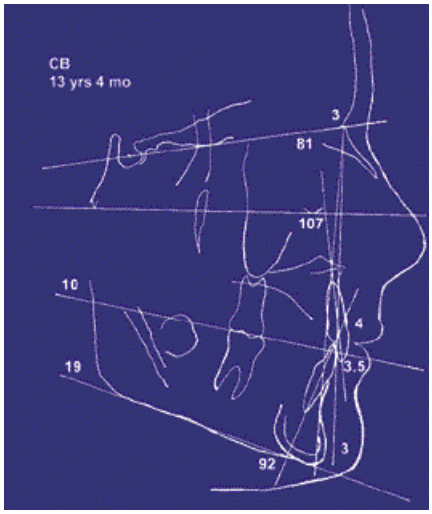


Posttreatment

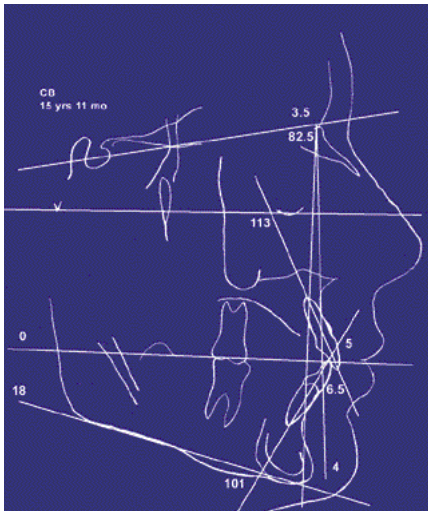
Posttreatment



Final



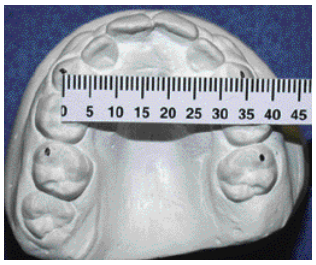
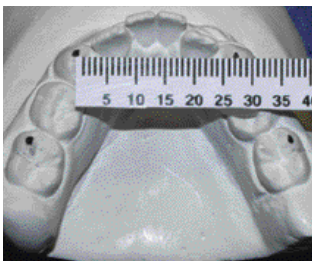
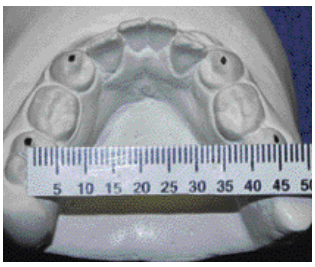
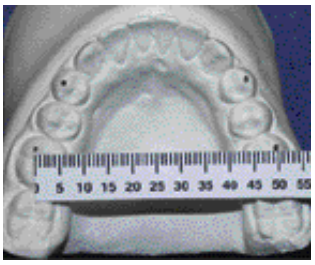
Initial

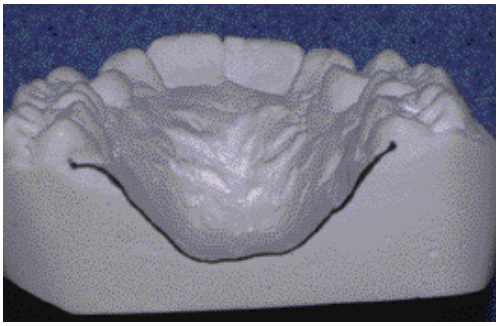


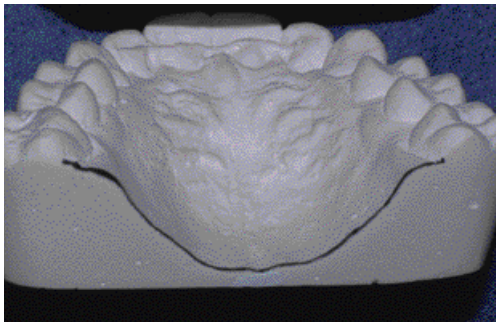
Final

Composite

Occlusal Cast Transverse Measurement Comparisons

Pretreatment	Posttreatment	Pretreatment	Posttreatment
			
34.0 mm	45.0 mm 11 mm change	27.0 mm	38.0 mm 11 mm change
			
41.0 mm	55.0 mm 14 mm change	44.5 mm	49.5 mm 5 mm change





Note palatal change, minimal tipping.

Retention:

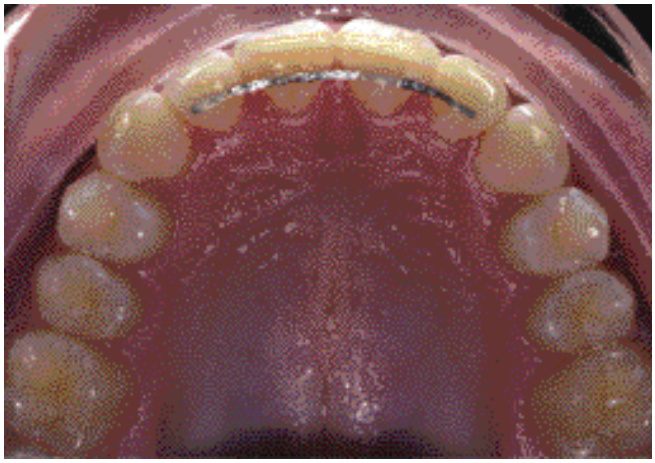
1. Maxillary .016 x .022 Hilgers braided wire bonded upper lateral to lateral.
2. Mandibular .026 round SS bonded to cuspids.
3. Upper and lower slip-cover retainer made – Night wear only.

1 year in retention – note tissue and bone

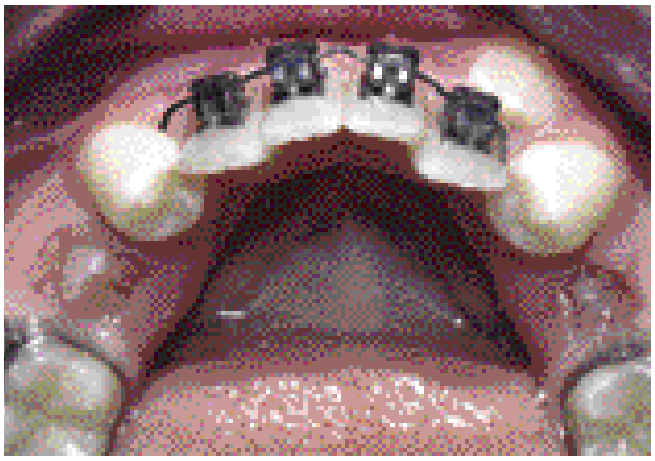
2.5 years in retention – no nighttime retention for 19 months.

C.B.

Initial Bonding



2.5 years retention



Initial Bonding

2.5 years retention