

M.J.

Age: 14 Years – 6 Months

Diagnosis: Class I Nonextraction – Youth (severe crowding, very flat profile)

Background:

Early in my career this patient would have been subjected to extractions without hesitation. Treatment decisions were based on headfilms and maintaining the original dental arch form. In following these cases long term, it became very apparent that there is a significant facial change with maturation. It is now well documented that there is tremendous nose and chin change into the late 20s and 30s. As these patients mature, many clinicians observed a tremendous dishing of facial profiles. When I started to challenge my thought process on treatment planning and its long-term facial impact, I asked the question, “Why are these patients so crowded?” Are the jaws smaller than normal or is there an imbalance of the orofacial musculature complex (*see Bioadaptive response*)? The treatment of this case illustrates very graphically what a significant role these muscle forces play in shaping arch form.

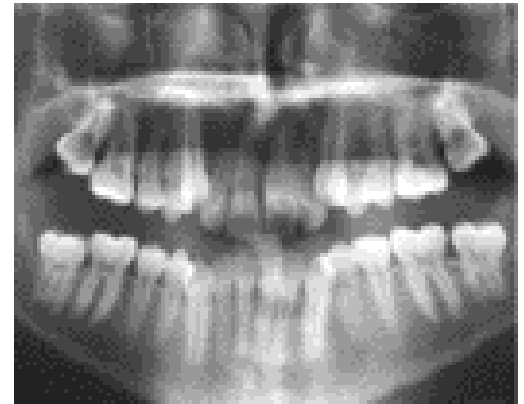
Orthodontists for many years have accepted the necessity of posterior arch change in early posterior crossbite cases (*see Posterior expansion*). This posterior arch change is usually fairly stable. Obviously the muscles have to adapt or these cases would never be stable. What is exciting about this new low-force technology used to treat this case is the positive impact it has on the alveolar bone and tissue. It appears that in most cases the patient is given a “second chance” to find a new balance of the orofacial muscular complex. Please observe the positive impact this low-force/low-friction treatment has had on this patient. The cuspids were engaged with the first archwire to encourage anterior movement of the incisors. It is very exciting when Face-Driven Orthodontics and Treatment Planning can be accomplished in 14 months 2 weeks and 7 working appointments.

Facial Evaluation:

1. Concave facial profile.
2. Prominent nose and chin.
3. Lack of lateral facial support.



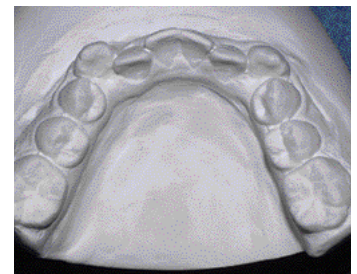
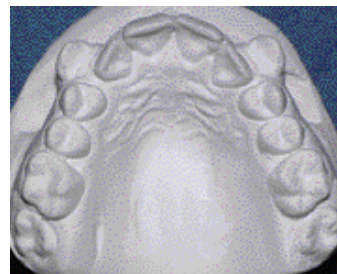
Pretreatment Radiographic Survey:



Lower third molars in poor position and extracted prior to treatment.

Dentition Evaluation:

1. Severe collapse of maxillary and mandibular arches.
2. Severe lack of arch length and width in maxilla and mandible.
3. Maxillary and mandibular incisors tipped lingually
4. Retrognathic position of incisors relative to body of mandible.
5. Upper incisors overerupted.
6. High and labially blocked cuspids.
7. Minimal bone and tissue covering labial of upper and lower cuspid.
8. Extracted mandibular third molars prior to treatment due to poor position.



Treatment Objectives:

Goal: Critically evaluate and project treatment planning impact on the face of this patient at 30 years of age. All of his brothers and sisters have a very strong nose and chin. Treatment mechanics designed to allow anteriors to come forward, giving increased facial support.

1. Allow low-force mechanics to work with the orofacial muscle complex, bone and tissue to establish a new physiologic tooth position (see *Physiologic adaptation*) that allows the tongue to move into its normal position to counter the force of the facial muscles.
2. Gain maxillary and mandibular arch length.
3. Design treatment mechanics to eliminate need for high-force rapid palatal expansion.
4. Establish appropriate upper anterior tooth-to-lip relationship.
5. Establish improved bone, tissue, and vascular support around upper and lower cuspids.
6. Improve profile and lateral facial support.

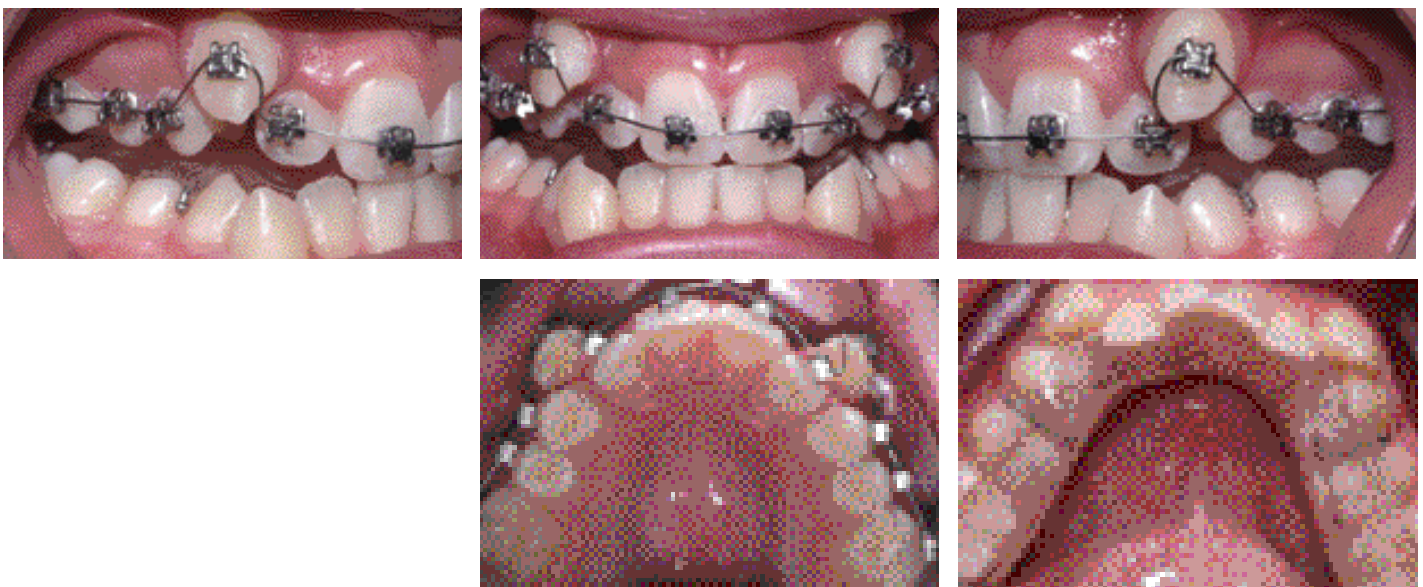
Treatment Sequence:

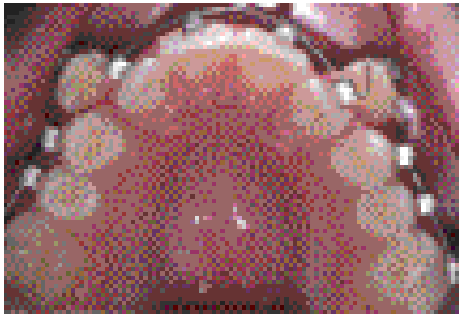
Special torques in appliance construction.

- Upper central $+7^\circ$ and laterals $+3^\circ$ (low-torque brackets). These brackets were chosen to keep incisors upright during unraveling and help prevent flaring forward.
- Lower centrals and laterals -6° (low-torque brackets). These brackets were chosen to keep incisors upright during unraveling and help prevent flaring forward.

Start:

1. Bonded maxillary 7 to 7 and placed mandibular bite plate to open bite enough to let the upper lateral incisors move out of crossbite.
2. Due to clinical desire to move the upper anteriors forward, engaged the maxillary cuspids with .014 NiTi SE (see *Initial archwire*).
3. Stop placed between left bicuspids, which limited ability to level and align maxillary arch. Should place crimpable stops anterior to cuspids (see *Crimpable stops*).

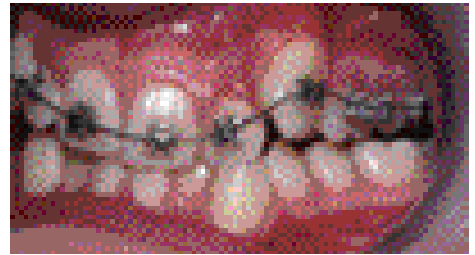
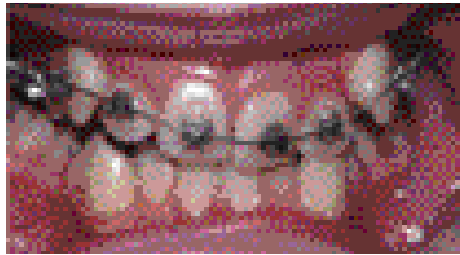




In this case the crimpable stop was placed posterior to the crowding. This prevented the wire from fully expressing itself. The crimpable stop should always be placed interior to the crowding.

Appt. 1

2 months – 2 weeks:

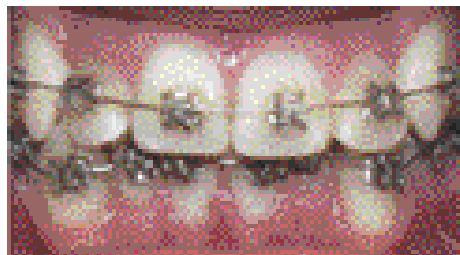
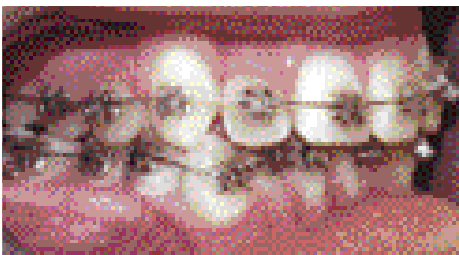


- Continued to let maxillary .014 NiTi S.E. archwire work.
- Continued full-time wear of lower bite plate. Note: This is a rare occasion when compliance is necessary.

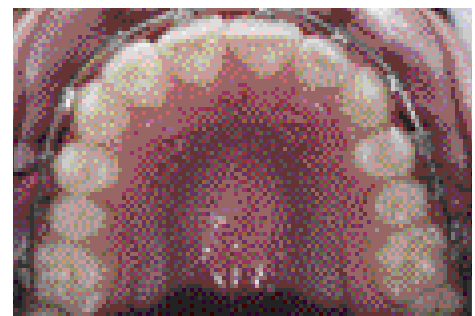


Appt. 2

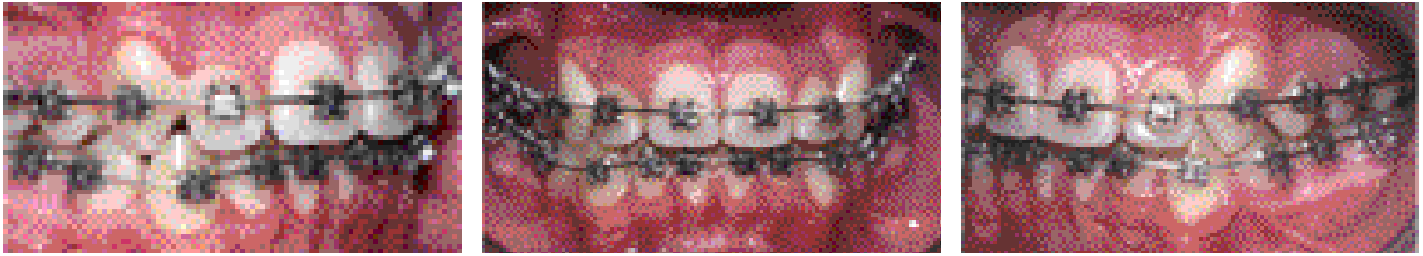
5 months:



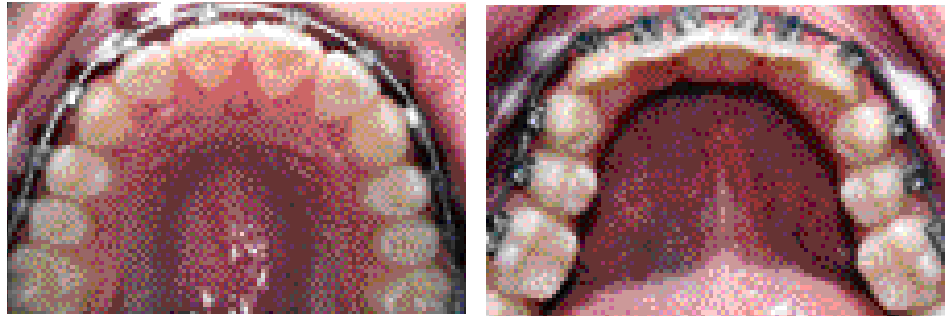
- Bonded mandibular arch 7 to 7.
- Placed maxillary .014 x .025 NiTi SE.
- Placed mandibular .014 NiTi SE.
- Note maintenance of Class I occlusion.



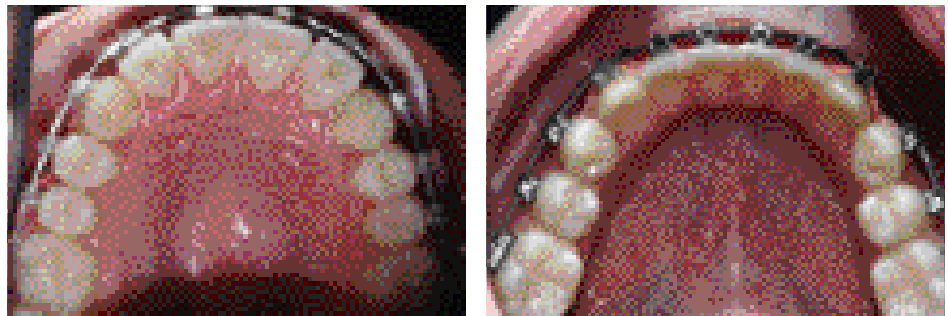
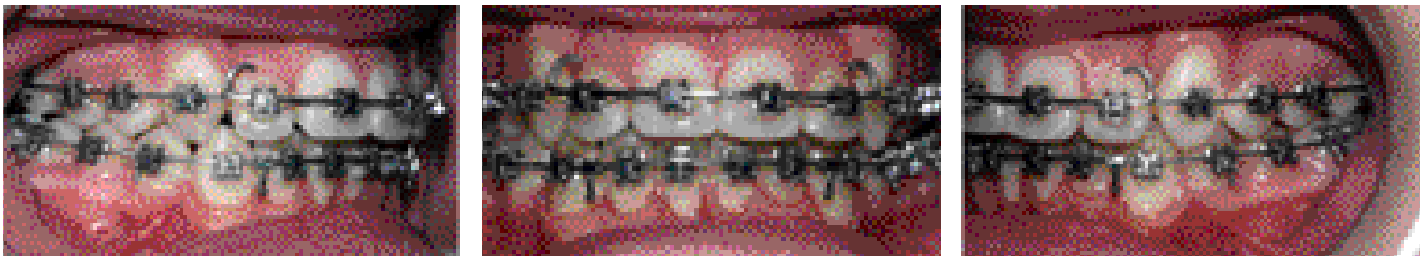
Appt. 3
7 months – 2 weeks:



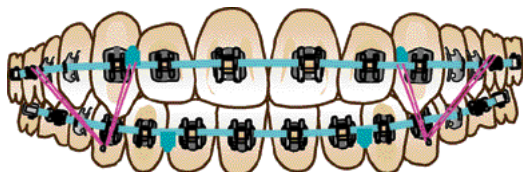
- Placed maxillary .016 x .025 NiTi SE and mandibular .014 x .025 NiTi SE (see Working phase archwire).
- Crowding remains, allowing .014 x .025 NiTi SE to finish initial phase. Bite opening vertically.



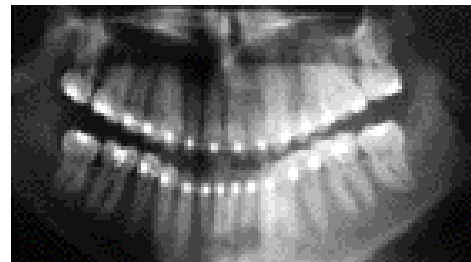
Appt. 4
9 months – 2 weeks:



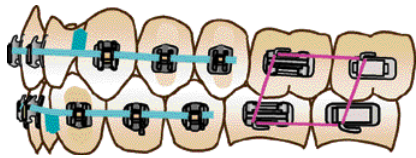
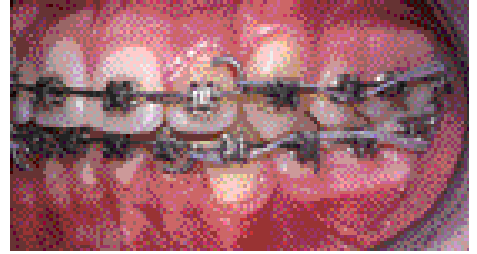
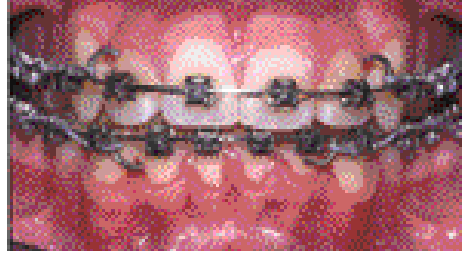
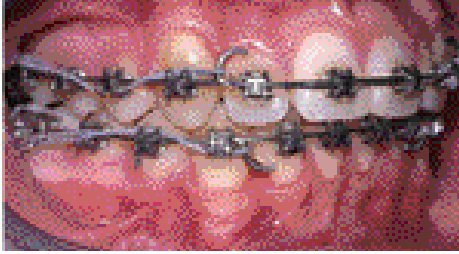
- Took Panorex. Evaluated root and bracket positioning. Changed defective bracket prior to archwire change.
- Placed maxillary .019 x .025 SS preposted archwire (see Final archwire).
- Started bilateral V-elastics 5/16" 6 oz. (see V-elastics).
- Placed crimpable hooks on the mandibular .014 x .025 NiTi SE. Note that maxillary centrals and laterals are continuously ligated with steel ligature wire to keep spaces from opening.
- Compared mandibular alignment to previous evaluation.



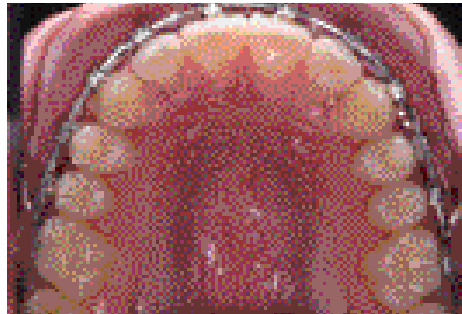
Bilateral V-elastics



Appt. 5
12 months:



Posterior Box Elastics



- Placed mandibular .016 x .025 pretopped stainless steel archwire. Since torque control was accomplished, it is very desirable to have play in bracket tube, which helps to close bite. Tiebacks are used to keep posterior spaces closed (see Tiebacks).
- Adjusted maxillary archwire.
- Continued bilateral V-elastics.
- Started posterior box elastics (see Box elastics).

Appt. 6
13 months – 2 weeks:



- Adjusted maxillary and mandibular archwire.
- Continued bilateral posterior V-elastics.
- Scheduled debonding.



Finals

14 months – 2 weeks: Debonded upper and lower.



Pretreatment



Posttreatment



Pretreatment



Posttreatment



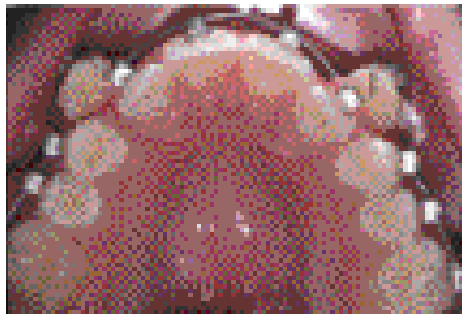
Final



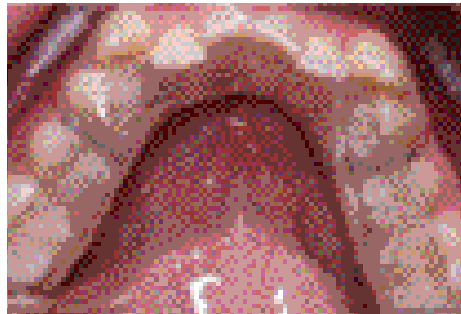
Final



Final



Initial Bonding



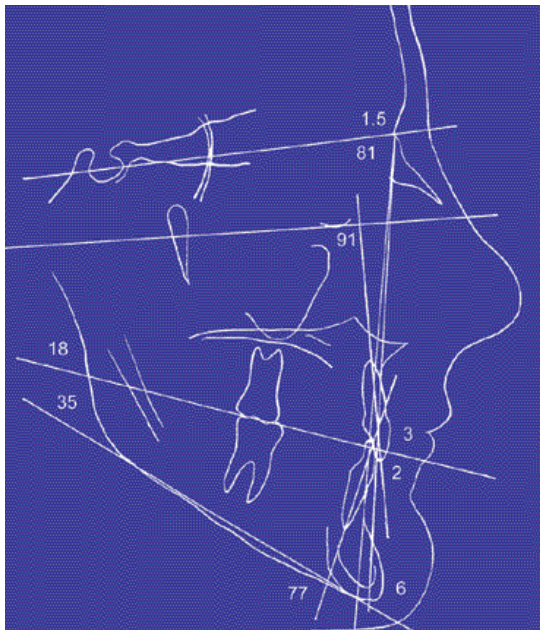
Initial Bonding



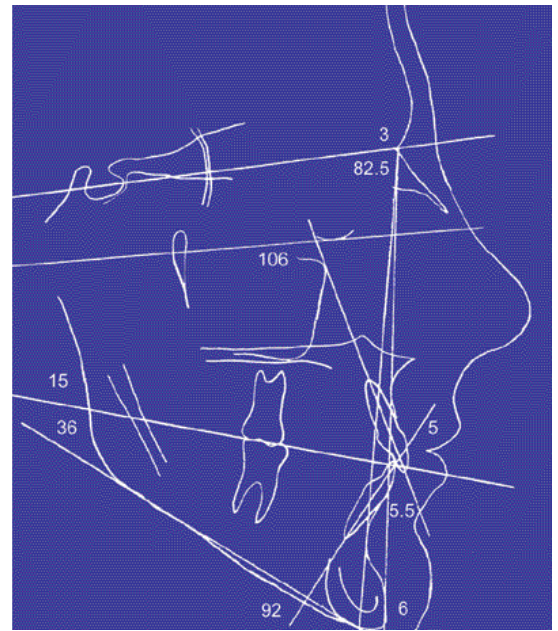
Posttreatment



Posttreatment



Initial



Final

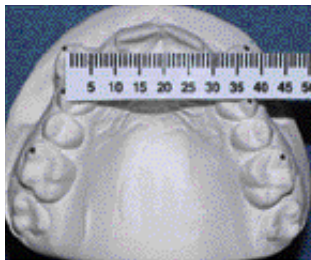
Occlusal Cast Transverse Measurement Comparisons

Pretreatment

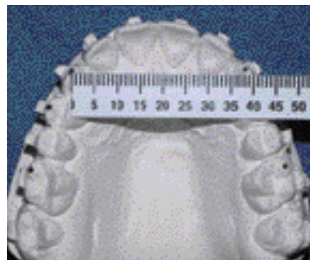
Posttreatment

Pretreatment

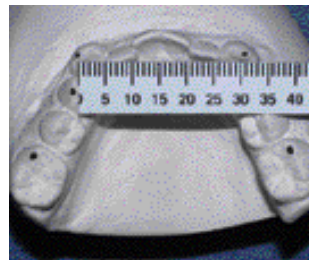
Posttreatment



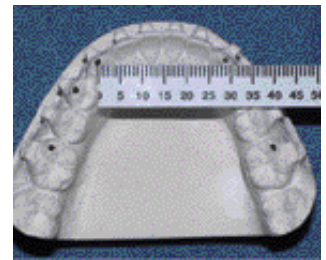
37.0 mm



38.5 mm
1.5 mm change



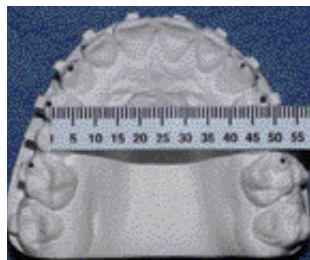
31.0 mm



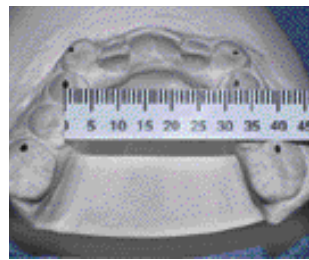
29.0 mm
-2.0 mm change



38.5 mm



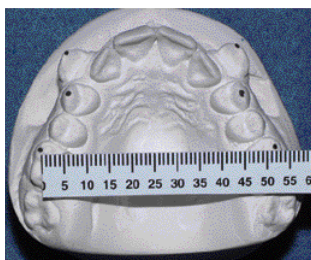
47.5 mm
9 mm change



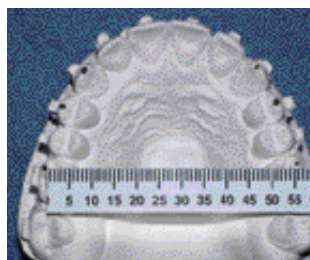
32.0 mm



39.0 mm
7.0 mm change



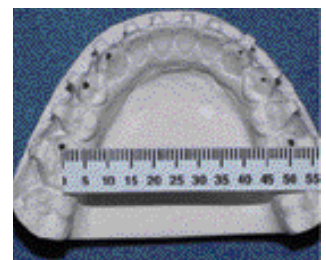
51.5 mm



55.5 mm
4.0 mm change



47.5 mm



50.5 mm
3.0 mm change

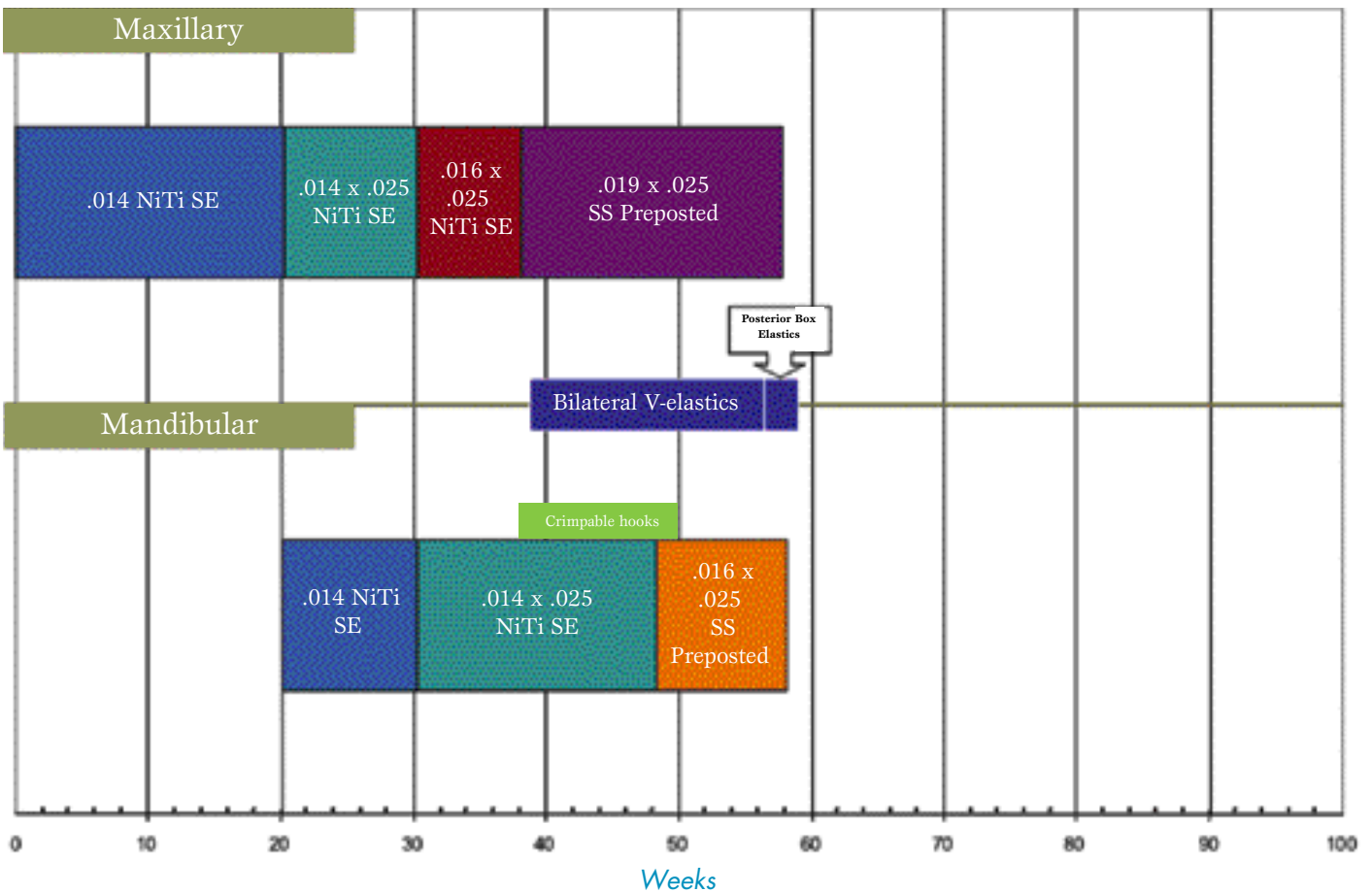


Composite

Retention:

1. Maxillary .016 x .022 Bond-a-Braid archwire bonded lateral to lateral.
2. Mandibular .026 stainless steel round bonded to all teeth cuspid to cuspid due to the severity of crowding.
3. Clear plastic overlay retainers made for upper and lower arches.
4. Damon splint to be worn nightly for first year.

M.J. Case Summary



M.J.



Initial



Final

Note the incredible bone and tissue contours around the upper right and lower left cuspids that were initially blocked out of the arch.