

Traditionally textbooks have described human dental bone as being a special purpose bone.

It responds to pressure by resorption (osteoclasts) and responds to tension by apposition (osteoblasts).

# Bone

## Alveolar and Supporting

**1. Traditional bone pictures on x-rays with bio-mechanic principles of orthodontic tooth movement.**

**2. Bone pictures on x-rays with **Bio\Analytic™ mechanics** principles of orthodontic tooth movement and bone remodeling.**

# 1. An example of how bone would look on an x-ray in traditional bio-mechanic movement of teeth.

## EXAMPLE OF VECTOR III® INTERACTIVE SPRING SEGMENTS USED ON CUSPID



**VECTOR III® INTERACTIVE SPRING  
PLACEMENT AT START**



**Progress with VECTOR III®  
INTERACTIVE SPRING at 7 days**



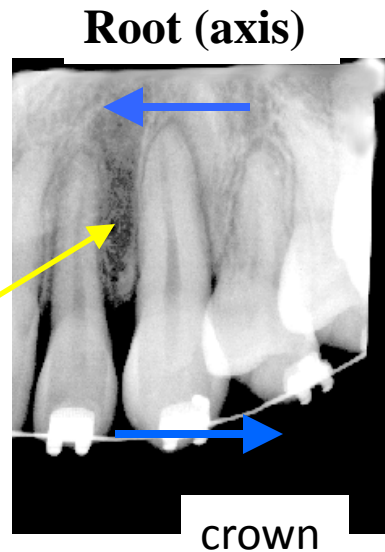
**Progress at  
1 month 26 days**

**X-ray shows bone apposition  
tension (osteoblasts) +.  
Increased radiopaque tooth socket.**



**Progress x-rays at 3 months**

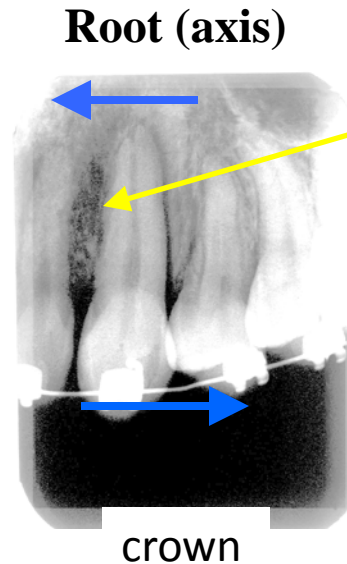
**X-ray shows bone resorption, pressure (osteoclasts) -. Reduced radiopaque, increased radiolucent less bone in area and direction tooth is moving. Axis uprighting root more than crown.**



**Progress x-rays at 3 months 28 days**

**X-ray shows radiolucent area, bone resorbed on pressure side (osteoclasts) -**

**Angulated bracket was repositioned to upright (tooth axis).**



# EXAMPLE OF VECTOR III® INTERACTIVE SPRINGS

## BIO\ANALYTIC™ MECHANICS

### BEGINNING PHOTOS AT THE START OF VECTOR III®



The traditional **bone** resorption (osteoclastic/pressure side) and the **bone** formation (osteoblastic/tension side) has been replaced with a functional remodeling of the supporting **bone**. The tooth and bone are moving, (socket and supporting **bone**) simultaneously. This is an example of \*Wolff's law, "the adaptation of structure to functional forces acting upon it".

### The traditional 3 step treatment;

1. Make space in a horizontal plane.
2. Bring the tooth down in a vertical plane.
3. Attempt to position the axis at the cuspid **root** into, an appropriate position.

## PROGRESS PHOTO & X-RAY SHOWING ROOTS & BONE AT 2 MONTHS & 1DAY



### **THE VECTOR III® HYPOTHESIS:**

By appropriately applying Newton's Law III and Wolff's Law, so as to interact synergistically in 3 planes of space concomitantly, it is feasible to remodel the supporting alveolar bone in such a way as to move the tooth with its' socket and supporting bone as a physiologic unit.

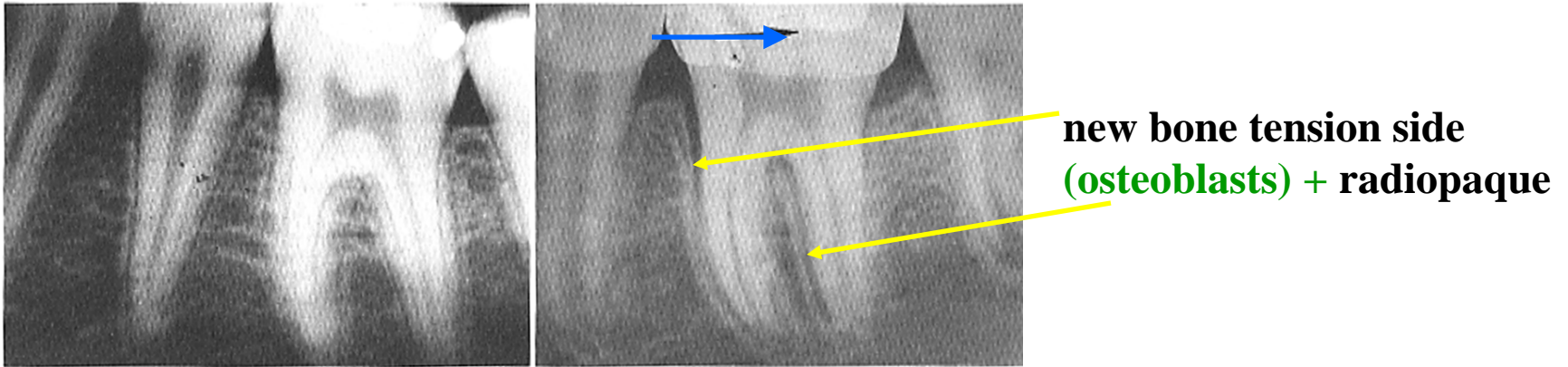


Fig. 7-11 A. A nonorthodontic dentoalveolar environment. B, An orthodontic dentoalveolar environment. Distal tipping and uprighting of mandibular first molar. (A, courtesy Dr. E.Follico.)

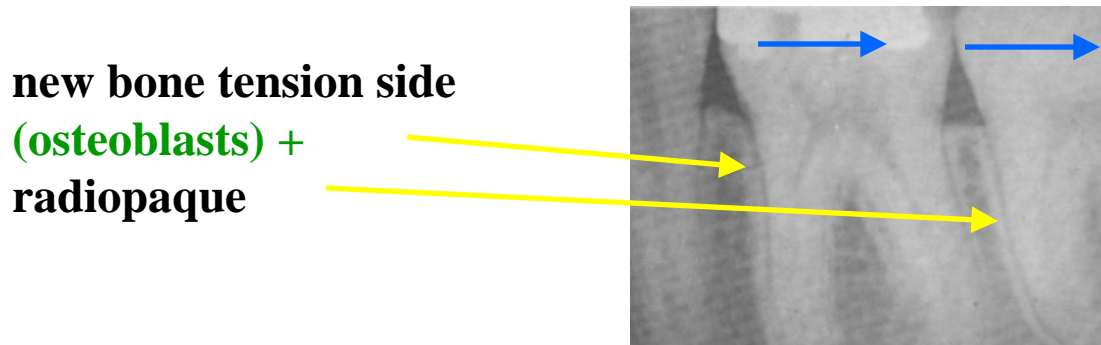
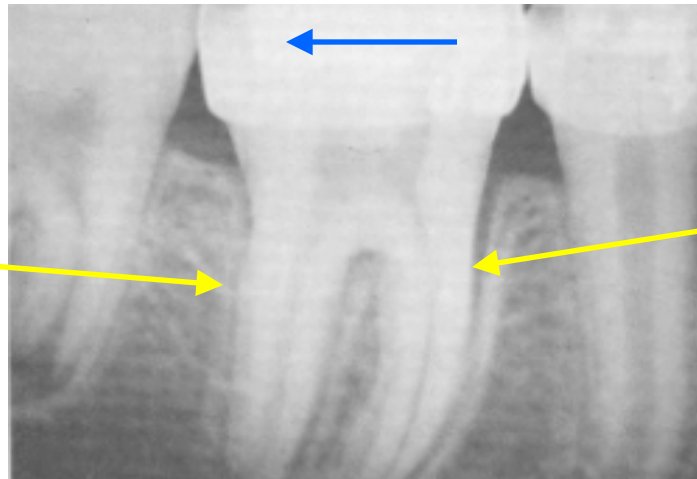


Fig. 7-12, New bone deposited along the mesial surface of a distally driven mandibular molar.

**Pressure side osteoclasts -**



**Tension side osteoblasts +**

Fig. 7-13. Distal tipping and elevation of mandibular first molar about an axis in the lower one half of the distal root.

A



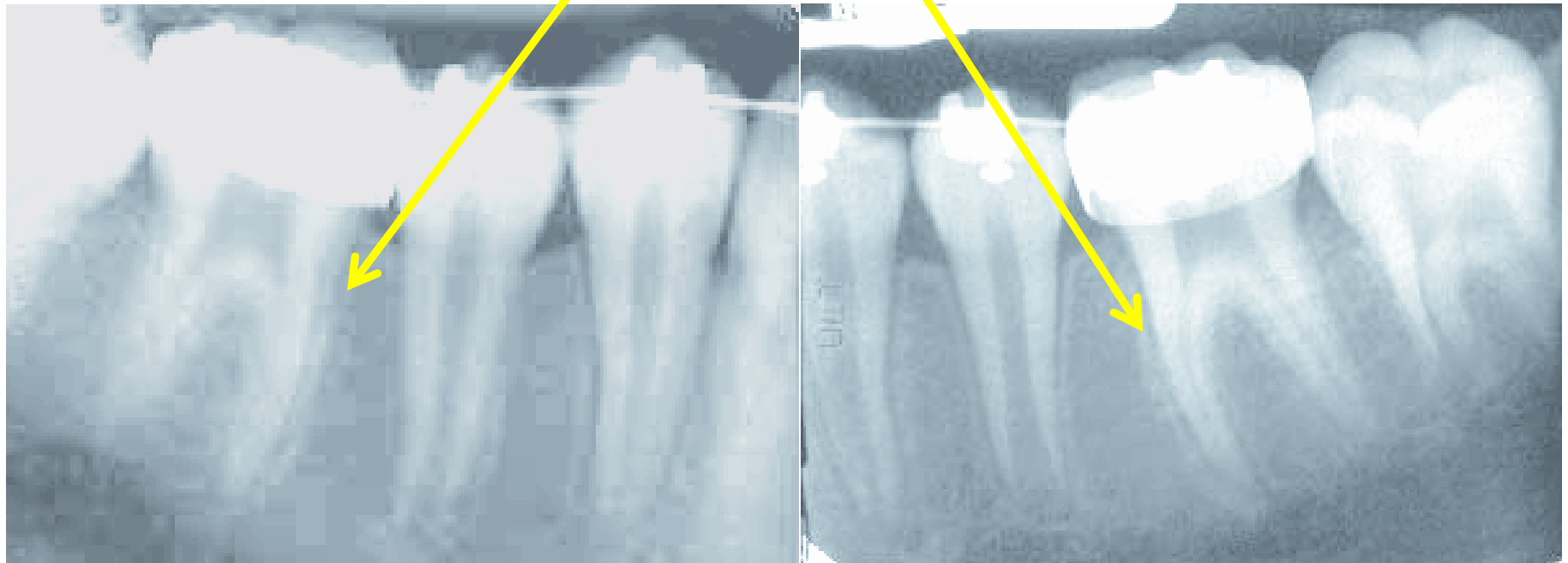
B



Fig. 7-40. Periodontal environment during and after mandibular tooth movements were completed with light forces on the molars. A, Mesial movement of uprighted molars. B, Same molar in retention. Roots have not resorbed, and there has been a complete rearrangement of the alveolodental environment.



Notice the bone osteoblasts + new bone (white on x-ray)



# EXAMPLE OF VECTOR III® UPRIGHTING SECOND MOLAR

**Start**

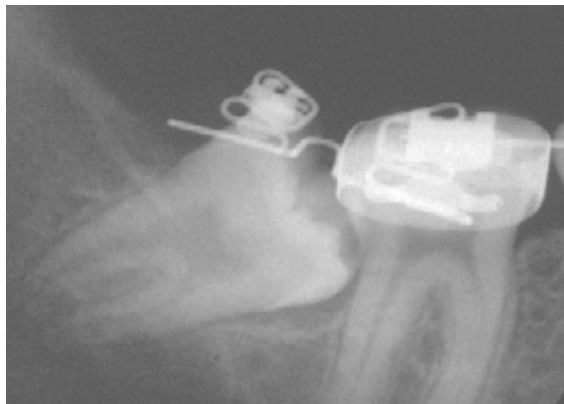


**Progress**

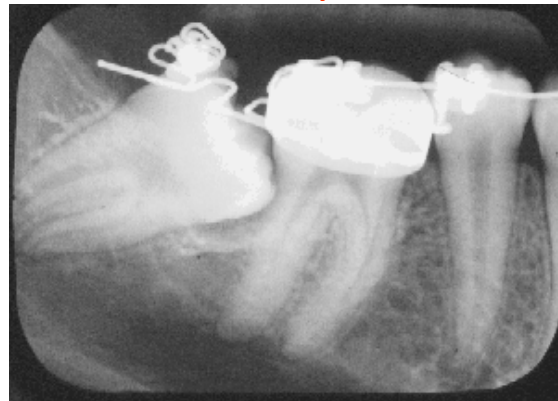


**\*\*NOTE THE BONE AROUND THE MOVING MOLAR AT EACH X-RAY**

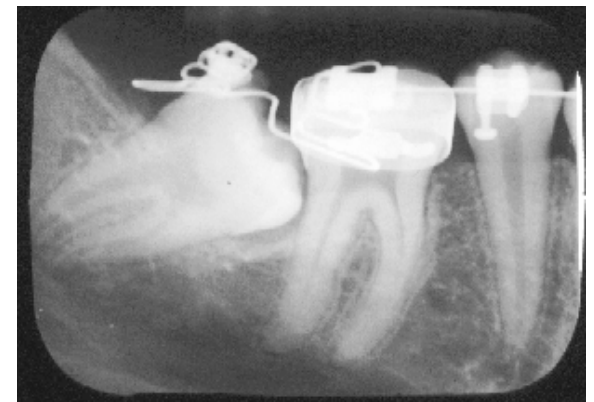
02-15



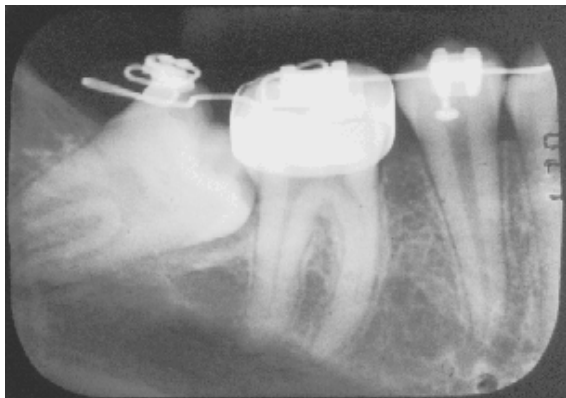
03-08 21 days



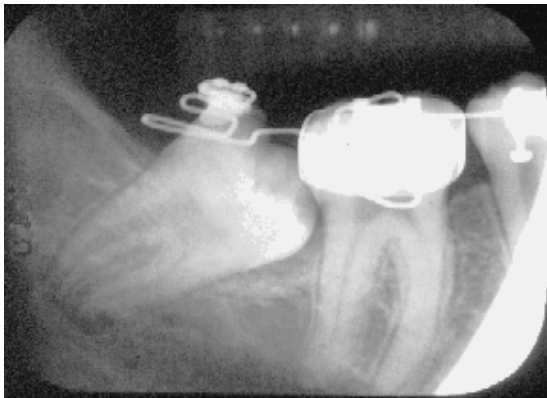
03-22 1 month 5 days



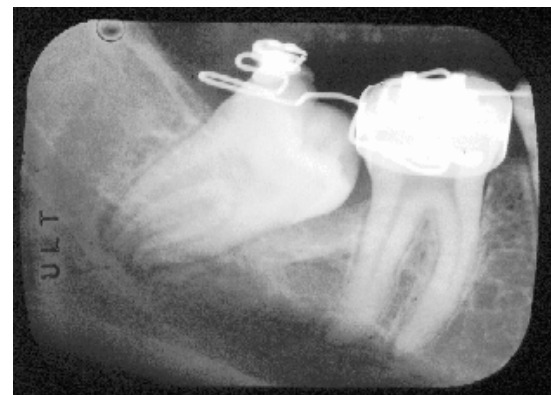
03-29 1 month 12 days



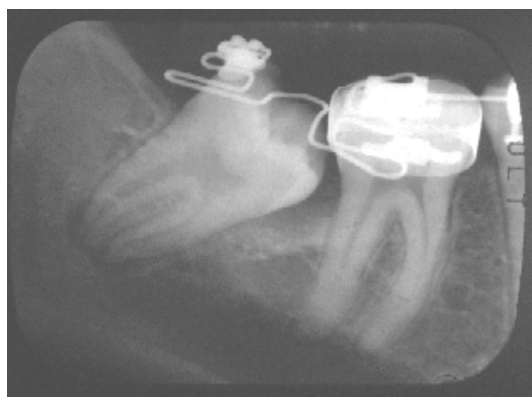
04-12 1 month 26 days



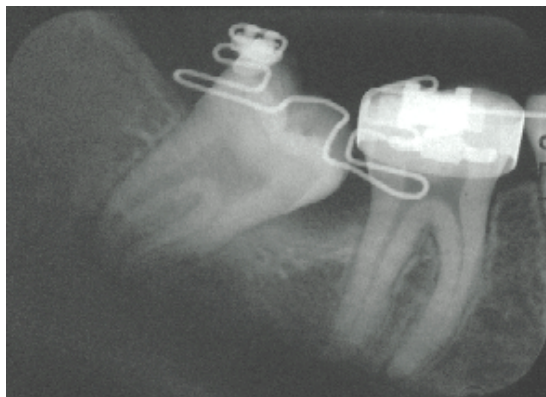
04-26 2 months 10 days



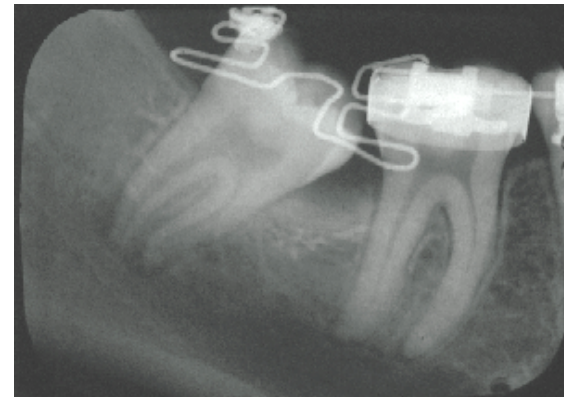
05-10 2 months 24 days



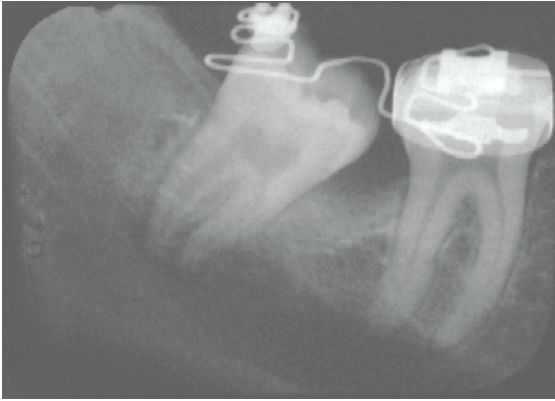
05-27 3 months 11 days



06-14 3 months 29 days



06-28 4 months 13 days



07-19 5 months 4 days



08-02 5 months 17 days



**START**



**Retention 17 months 2 days**



# Pre-treatment photos

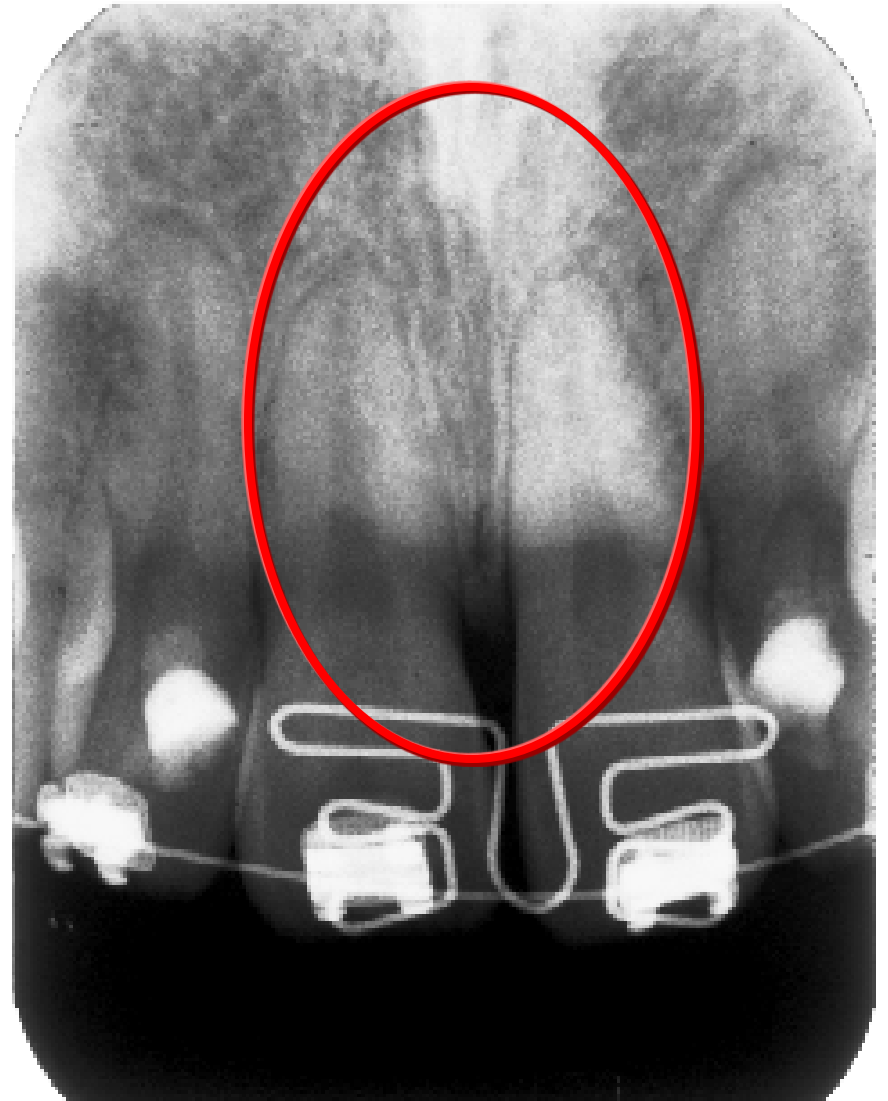
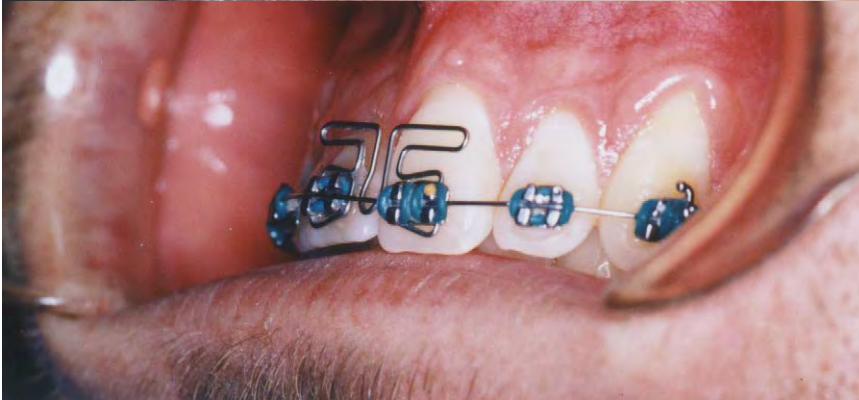
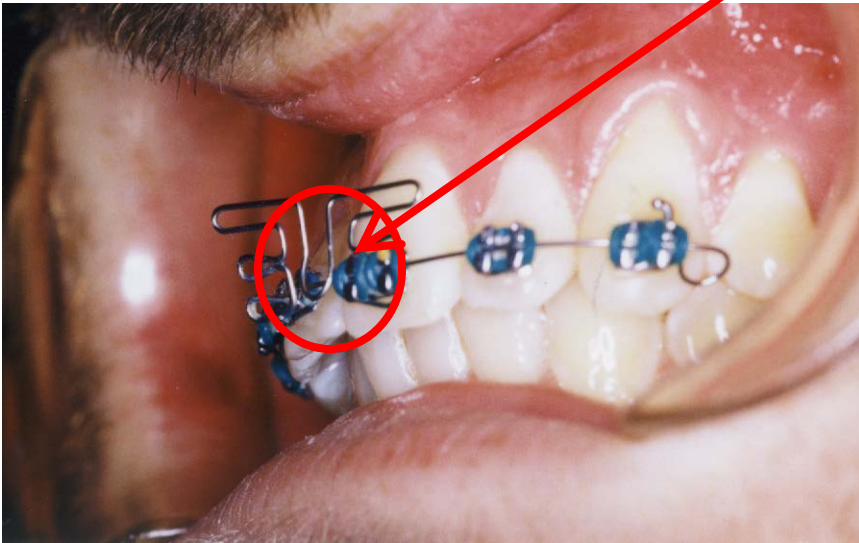


# Pre-treatment photos and x-ray

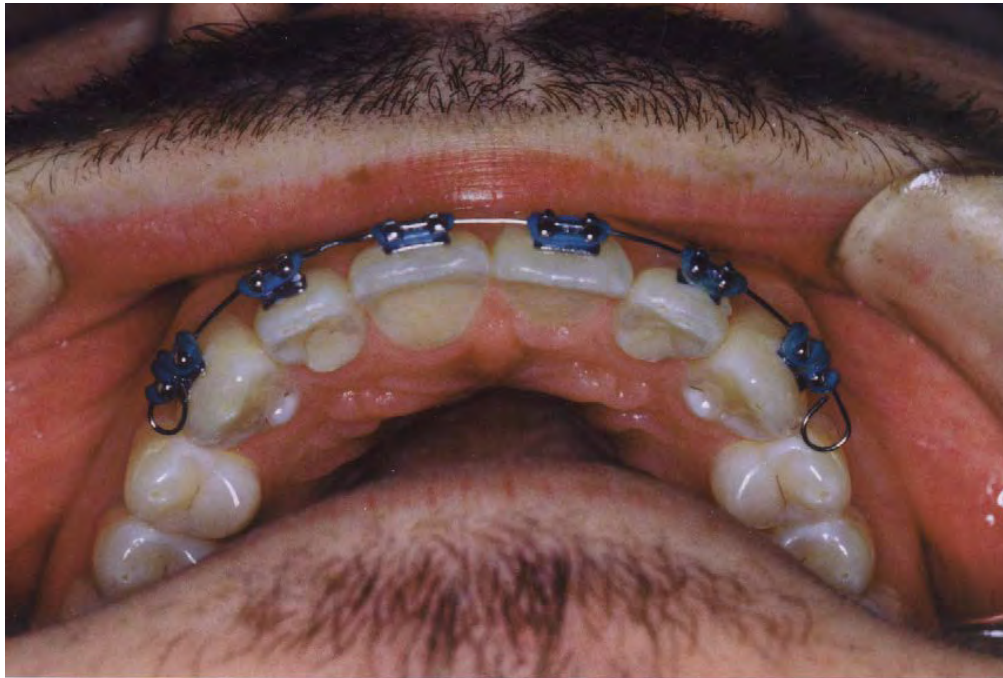


## Progress at 25 days

View of **VECTOR III®** spring after it was removed & activated then replaced at 25 days.



We held the case in this position for **6 months & 1 day** to be able to answer questions as to what it looks like in 6 months

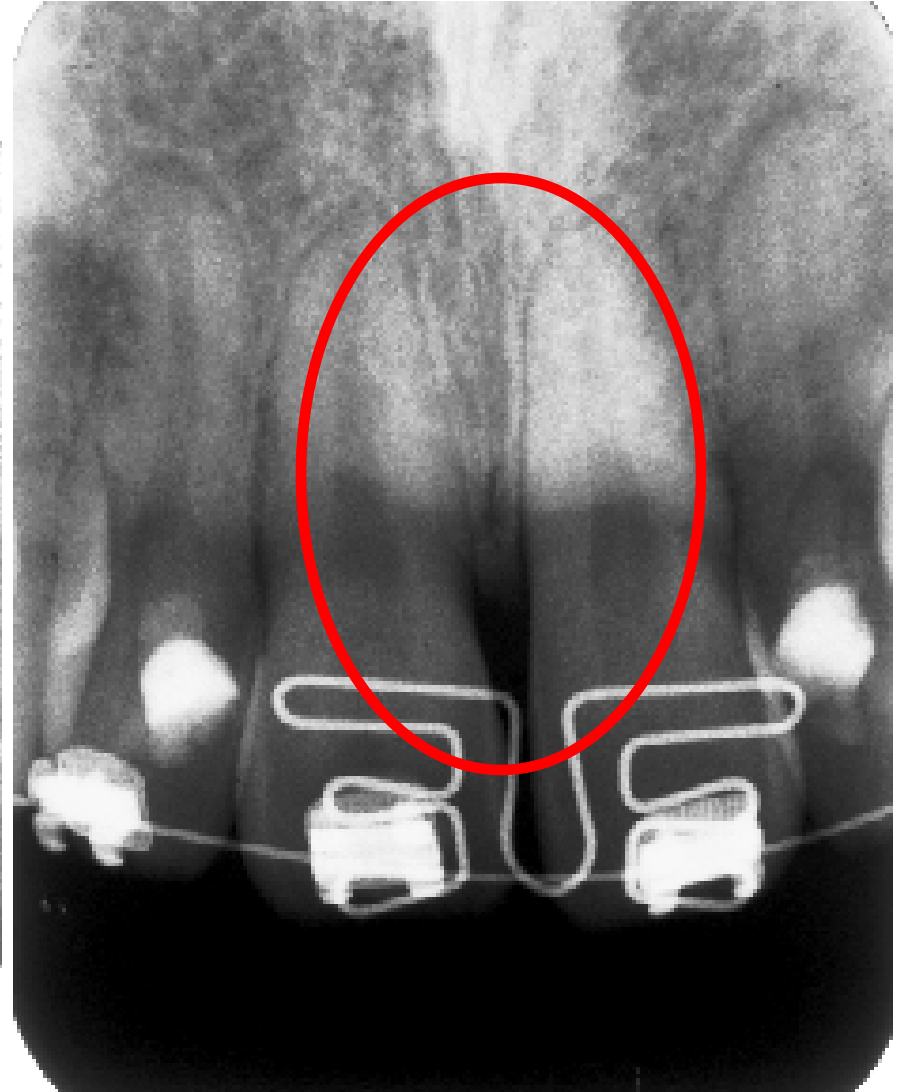




Start



Progress 25 days



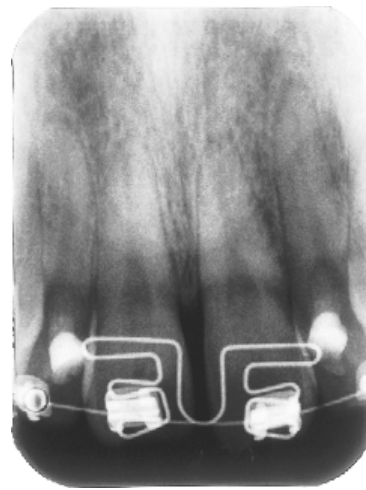
2-11 start



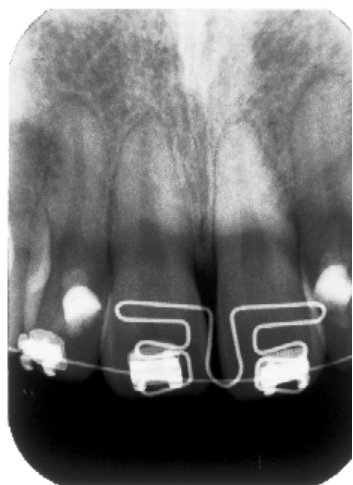
2-22 11days



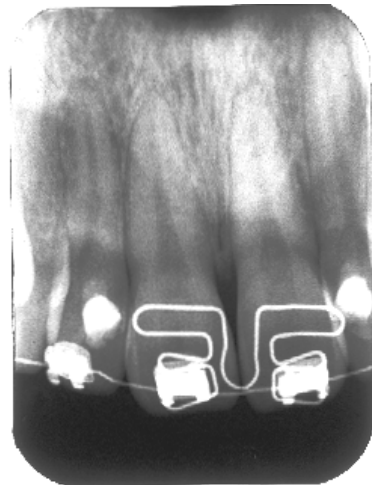
14 days  
2-25 14 days - severe angle



3-8 25 days



4-26 2 M + 15 D



7-8 4M + 28 D



8-12 6M + 1 D





# Bone

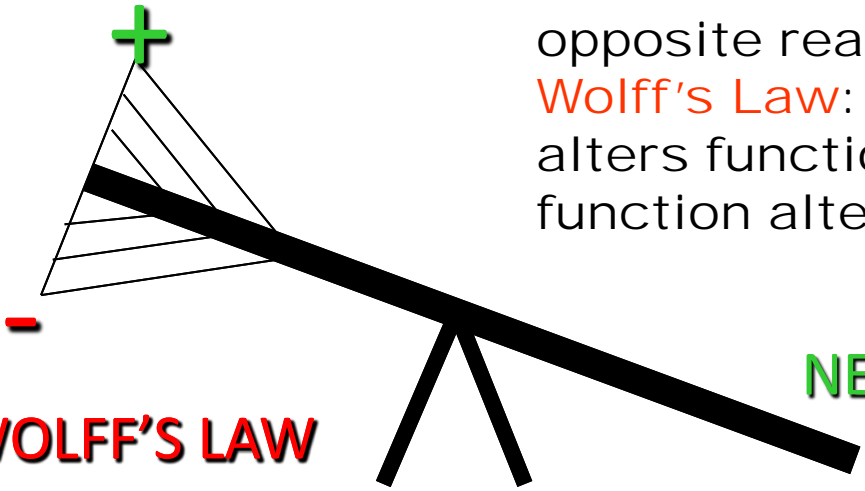
## Alveolar and Supporting

**1. Traditional bone pictures on x-rays with bio-mechanic principles of orthodontic tooth movement.**

**2. Bone pictures on x-rays with **BioAnalytic™** mechanics principles of orthodontic tooth movement and bone remodeling.**

# THE TEETER TOTTER PRINCIPLE™

Regarding bone:  
**Newton's Law III:** To every action there is an equal and opposite reaction  
**Wolff's Law:** Altered structure alters function, altered function alters structure.



## WOLFF'S LAW

Reaction side  
 Living physiologic  
**Bio\Analytic mechanics™**

## NEWTON'S LAW III

Action Side  
 Non-living  
 Analytic mechanics  
**Bio-mechanics**

## NEWTON'S LAW III

**BIO | ANALYTIC MECHANICS™ =**

**LIVING FUNCTIONAL FACTOR (LLF)™**

**THE VECTOR III® THEOREM:****Newton's Law III**

$$\text{Bio}\backslash\text{Analytic}^{\text{TM}} \text{ Mechanics} = \frac{\text{Newton's Law III}}{\text{Living Functional Factor (LFF)}}$$

**Living Functional Factor "LLF"<sup>TM</sup> Natures designs of functions:**

- A) Forces in direction of natures design.**
- B) Forces in opposite or altered directions of natures design.**

**Resistant or opposite forces in a living medium are not linear or constant.**

**Resultant resistant forces in a living medium, which include the physiologic function, vary when they are subliminal, optimal or excessive. This contributes to vector forces in a living environment being nonlinear and not constant in nature.**

**Forces of the same vector, magnitude and direction (rate), but acting in a nonliving amorphous medium, result in a linear constant resistance.**

**Newton's Law III must be modified to account for this living function factor when applied to living environments.**

**Historically engineering mechanics have been used in the design and application of orthodontic appliances.**

**The resistance of opposite reaction forces have been expressed as being opposite and equal.**

## **Living Functional Factor “LFF”™**

**When the living functional factor is added to analytic mechanics, it becomes **Bio\Analytic™ mechanics**.**

**A.) When one evaluates **Bio\Analytic™ mechanics** from the living resistant force side instead of the application mechanical force side, a more comprehensive and complex picture evolves.**

**B.) It is appropriate to consider Wolff’s Law in regards to living bone as a physiologic medium.**

**Wolff’s Law I; Every change in the form and the function of a bone, or in its function alone is followed by certain definite changes in its internal architecture and secondary alternatives in its external conformation.**

**An abstract from “Histology”, Arthur Worth Ham, M.B., page 223. To paraphrase: Bone, altered function alters structure and vice-versa .**

## **THE VECTOR III® HYPOTHESIS:**

By appropriately applying Newton's Law III and Wolff's Law, so as to interact synergistically in 3 planes of space concomitantly, it is feasible to remodel the supporting alveolar bone in such a way as to move the tooth with its' socket and supporting bone as a physiologic unit.

**BIO\ANALYTIC™ MECHANICS +  
VECTORLOY™ WIRE =  
REVOLUTIONARY RESULTS**



# 1. An example of how bone would look on an x-ray in traditional bio-mechanic movement of teeth.

## EXAMPLE OF VECTOR III® INTERACTIVE SPRING SEGMENTS USED ON CUSPID



**VECTOR III® INTERACTIVE SPRING  
PLACEMENT AT START**



**Progress with VECTOR III®  
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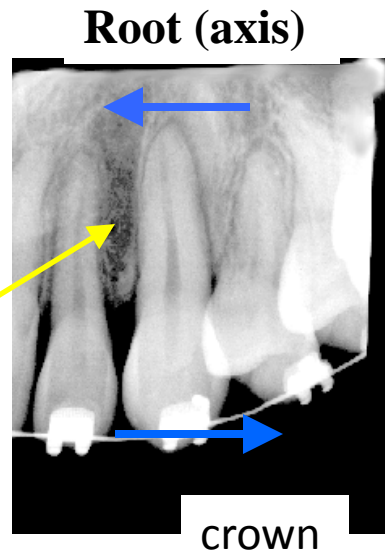
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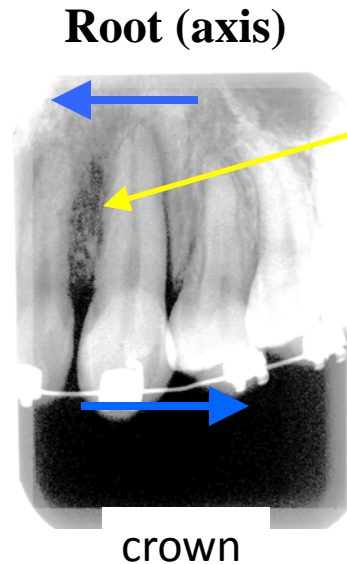
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**Angulated bracket was repositioned to upright (tooth axis).**



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## BIO\ANALYTIC™ MECHANICS

### BEGINNING PHOTOS AT THE START OF VECTOR III®



The traditional **bone** resorption (osteoclastic/pressure side) and the **bone** formation (osteoblastic/tension side) has been replaced with a functional remodeling of the supporting **bone**. The tooth and bone are moving, (socket and supporting **bone**) simultaneously. This is an example of \*Wolff's law, "the adaptation of structure to functional forces acting upon it".

### The traditional 3 step treatment;

1. Make space in a horizontal plane.
2. Bring the tooth down in a vertical plane.
3. Attempt to position the axis at the cuspid **root** into, an appropriate position.

**THESE 3 STEPS WOULD RESULT IN A CONVENTIONAL PROGRESS X-RAY VIEW OF BONE. TO ACHIEVE A COMPARABLE BONE PICTURE TO THE VECTOR III® RESULTS, IT WOULD BE NECESSARY TO HOLD THE CUSPID IN ITS' FINAL POSITION FOR WEEKS IF NOT MONTHS.**

**THE VECTOR III® (TOOTH/ROOT/BONE) MOVEMENT IS “ROOT & BONE FRIENDLY” AND EXHIBITS A NOMINAL AMOUNT OF DISCOMFORT OR TISSUE INFLAMMATION TO THE PATIENT.**

## PROGRESS PHOTO & X-RAY SHOWING ROOTS & BONE AT 2 MONTHS & 1DAY



### **THE VECTOR III® HYPOTHESIS:**

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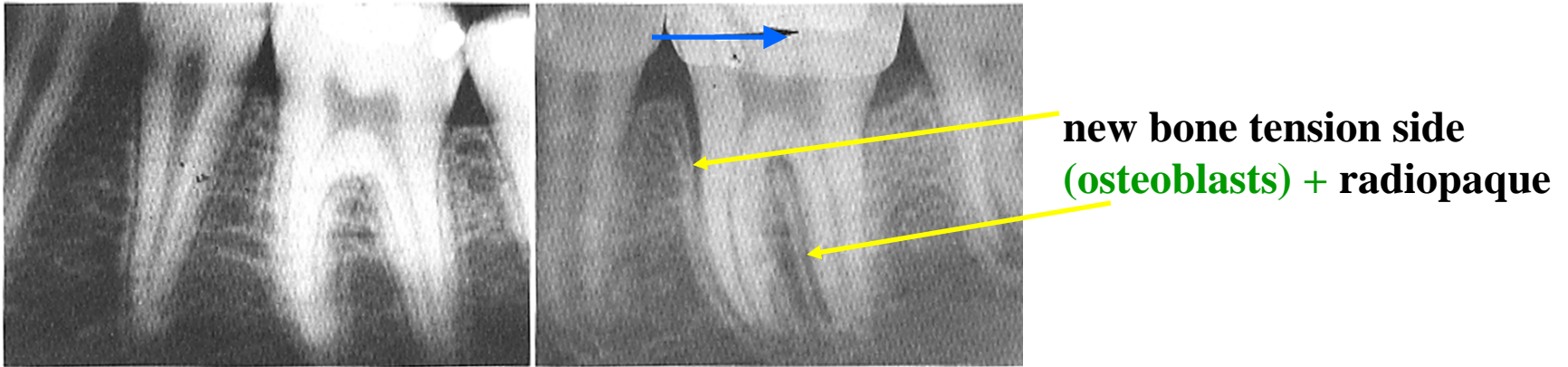


Fig. 7-11 A. A nonorthodontic dentoalveolar environment. B, An orthodontic dentoalveolar environment. Distal tipping and uprighting of mandibular first molar. (A, courtesy Dr. E.Follico.)

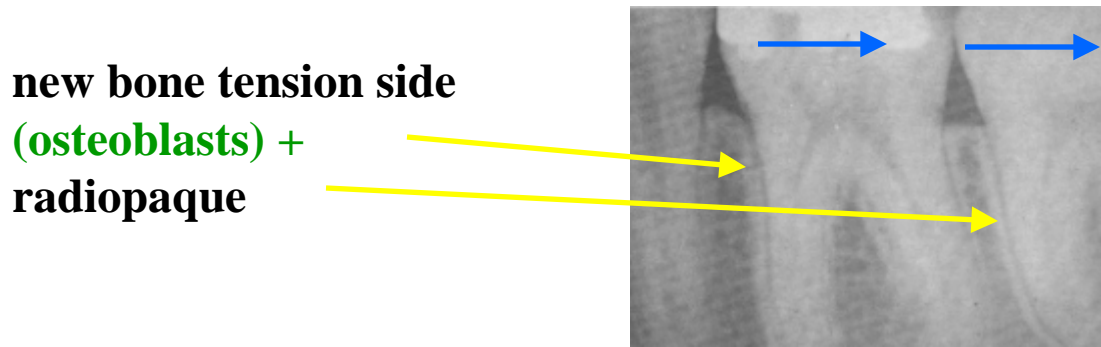
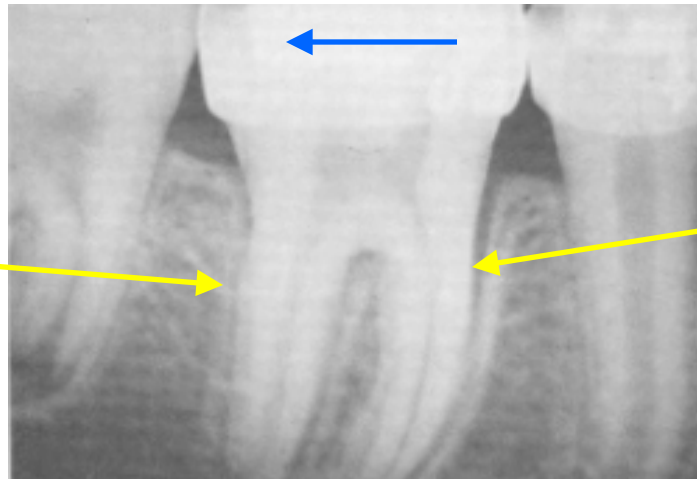


Fig. 7-12, New bone deposited along the mesial surface of a distally driven mandibular molar.

**Pressure side osteoclasts -**



**Tension side osteoblasts +**

Fig. 7-13. Distal tipping and elevation of mandibular first molar about an axis in the lower one half of the distal root.

A

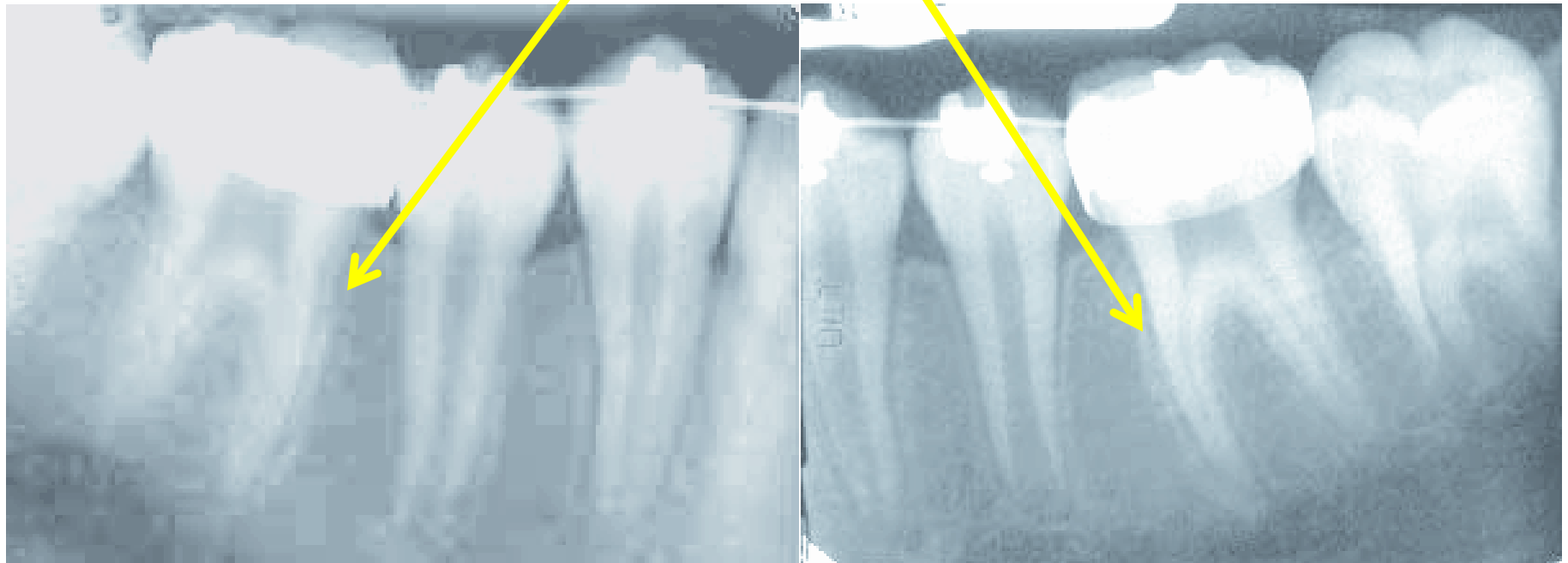


B



Fig. 7-40. Periodontal environment during and after mandibular tooth movements were completed with light forces on the molars. A, Mesial movement of uprighted molars. B, Same molar in retention. Roots have not resorbed, and there has been a complete rearrangement of the alveolodental environment.

Notice the bone osteoblasts + new bone (white on x-ray)





## **EXAMPLE OF VECTOR III® UPRIGHTING SECOND MOLAR**

**THE BIOANALYTIC™ MECHANICAL FORCE SYSTEM DESIGN OF THE VECTOR III® SPRINGS ACT SYNERGISTICALLY IN 3 PLANES OF SPACE CONCOMITANTLY TO CONTRIBUTE TO THE 3 MONTH & 11 DAY PROGRESS RESULTS IN THESE PHOTOS.**

**THE X-RAYS ARE TAKEN OF A TOOTH PROGRESSIVELY MOVING NOT OF A TOOTH IN A “FIXED POSITION” OVER AN EXTENDED PERIOD OF TIME.**

**THE LACK OF TENSION SIDE BONE “BUILD-UP” AND THE LACK OF ENLARGED ROOT/SOCKET SPACE IS NOTEWORTHY. FURTHER EVALUATION OF THE BONE, ON THE PROGRESS X-RAYS, WOULD TEND TO LEAD US TO THE FOLLOWING CONCLUSIONS;**

- 1. GOOD UPRIGHTING PROGRESS ON THE IMPACTED TOOTH.**
- 2. AN ATYPICAL BONE PICTURE ON THE PROGRESS X-RAYS GIVING CREDENCE TO THE FEASIBILITY OF REMODELING OF THE ALVEOLAR BONE IN SUCH A WAY AS TO MOVE THE TOOTH WITH ITS’ SOCKET AND THE SUPPORTING BONE AS A PHYSIOLOGIC UNIT.**

# EXAMPLE OF VECTOR III® UPRIGHTING SECOND MOLAR

**Start**

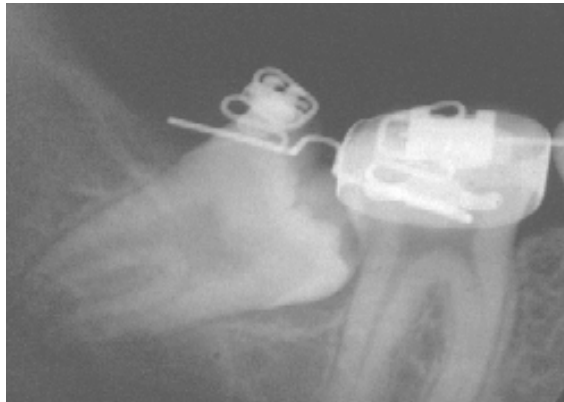


**Progress**

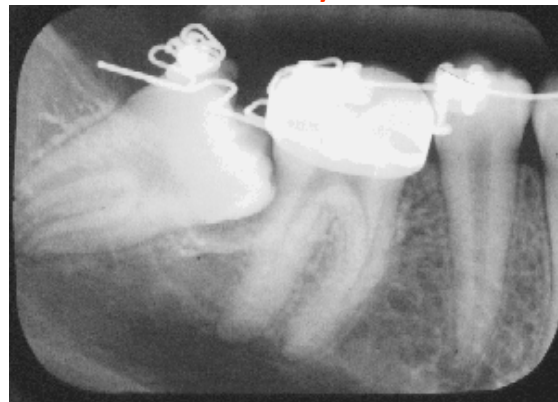


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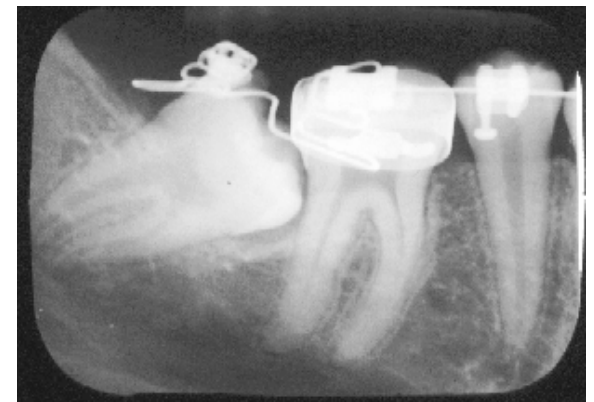
02-15



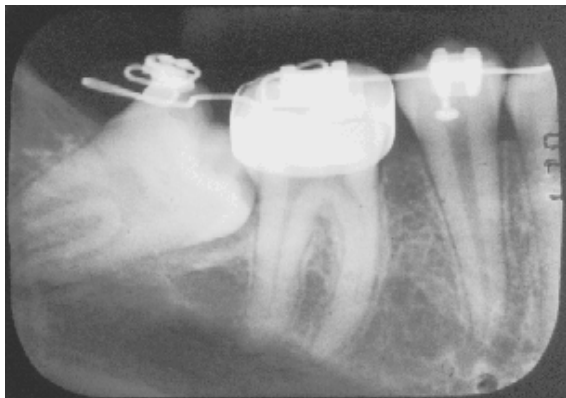
03-08 21 days



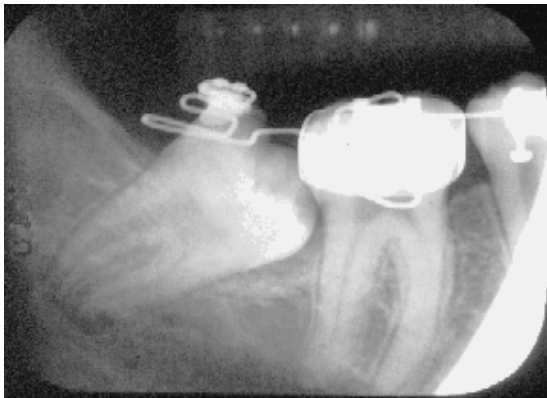
03-22 1 month 5 days



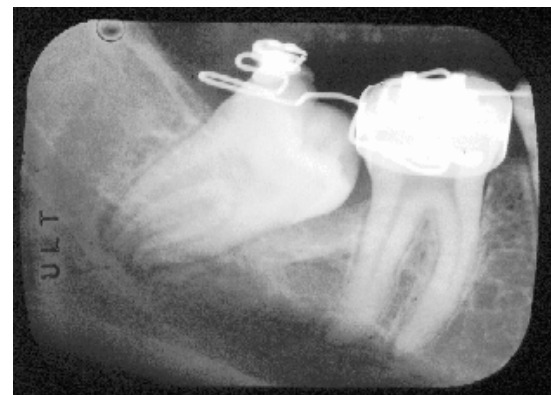
03-29 1 month 12 days



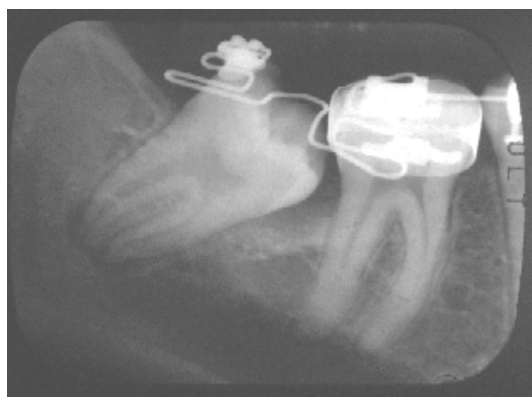
04-12 1 month 26 days



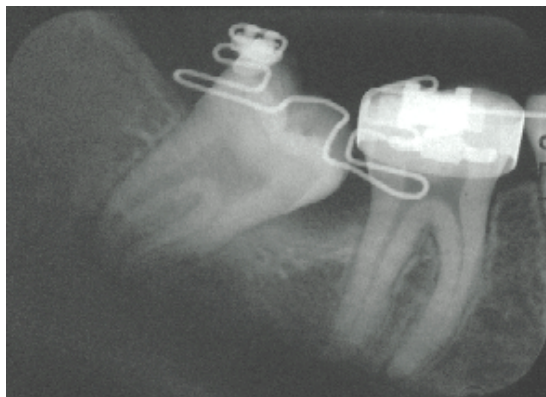
04-26 2 months 10 days



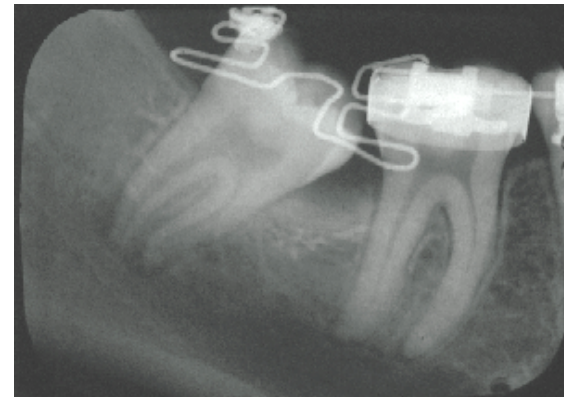
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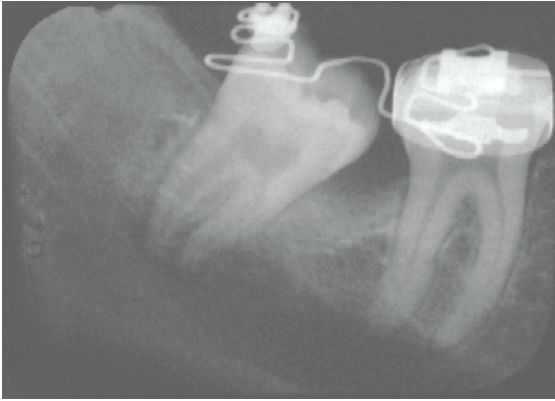
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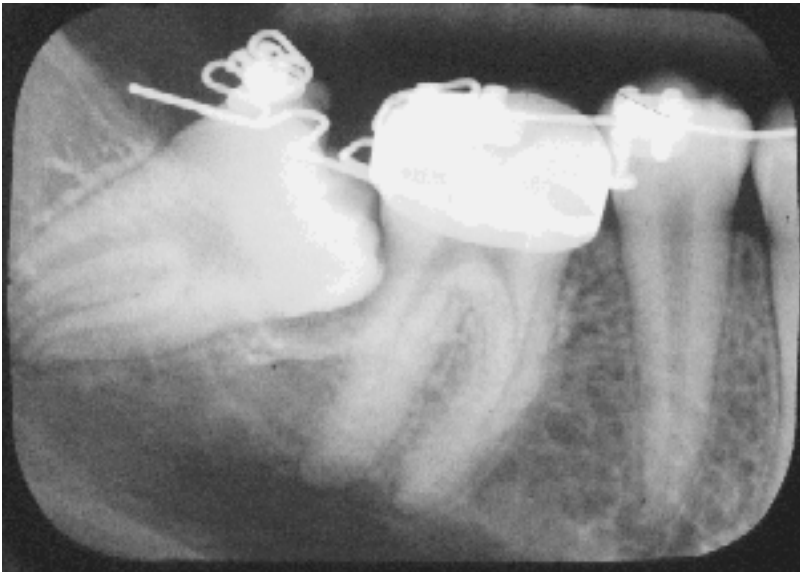
07-19 5 months 4 days



08-02 5 months 17 days



**START**



**Retention 17 months 2 days**



# THE “ANKYLOSED TOOTH” STORY

The patient , a man of 24 years of age, came into the office with his upper right central in the position shown on the pre-treatment color photo. The patient said the tooth was injured approximately at the age of 12 and healed to the bone in that position.

He then later had orthodontic treatment for a period of about 3 years but it was not successful in repositioning the ankylosed right central.

Ten years had passed. The patient had heard about the **VECTOR III<sup>®</sup>** treatment from a friend.

In his initial exam he asked if **VECTOR III®** could move his tooth. He said no one would try to move it, everyone he had seen told him that a tooth healed to the bone (ankylosed) could not be moved.

The pre-treatment x-ray shows (inside the circle), page 48, the arc of the tooth and the bone, which tended to confirm the patient's story. The patient was then advised that "who" was not the issue but, "what", trying to move an ankylosed tooth, was the issue. He understood that it was the tooth that was the problem not the orthodontists. He wanted to try **VECTOR III®** anyway for 3-4 months and if there was no progress at that point we agreed he would stop treatment and the payments at that time.

## \*NOTE THE PROGRESS

**11 days** x-rays of root and adjacent bone

**14 days** x-ray of roots and adjacent bone

**25 days** color photos of tooth positioning progress

and

x-ray of roots.

Further x-rays were taken at 2 months 12 days & at 4 months 24 days.

The root movement after 25 days was nominal. This was speculated as a result of the root being near the labial plate of bone and at that force level it was unable to continue movement.

The force level was not changed from the original **VECTOR III**<sup>®</sup> design. This was considered to be acceptable by the patient and the doctor .

\*NOTE It was held in that position for 3½ months and evaluated to avoid root resorption or any negative bone picture. The degree of success was deemed to be, “discretion is the greater part of valor”

The doctor and patient were “happy”. The **VECTOR III**<sup>®</sup> Hypothesis can be referred to as a generalized explanation. Doctors and patients can find (if desired) a comprehensive explanation in the textbook “Not Just Another Spring”, Chapter 3, **Bio\Analytic Mechanics**<sup>™</sup>.



# Pre-treatment photos

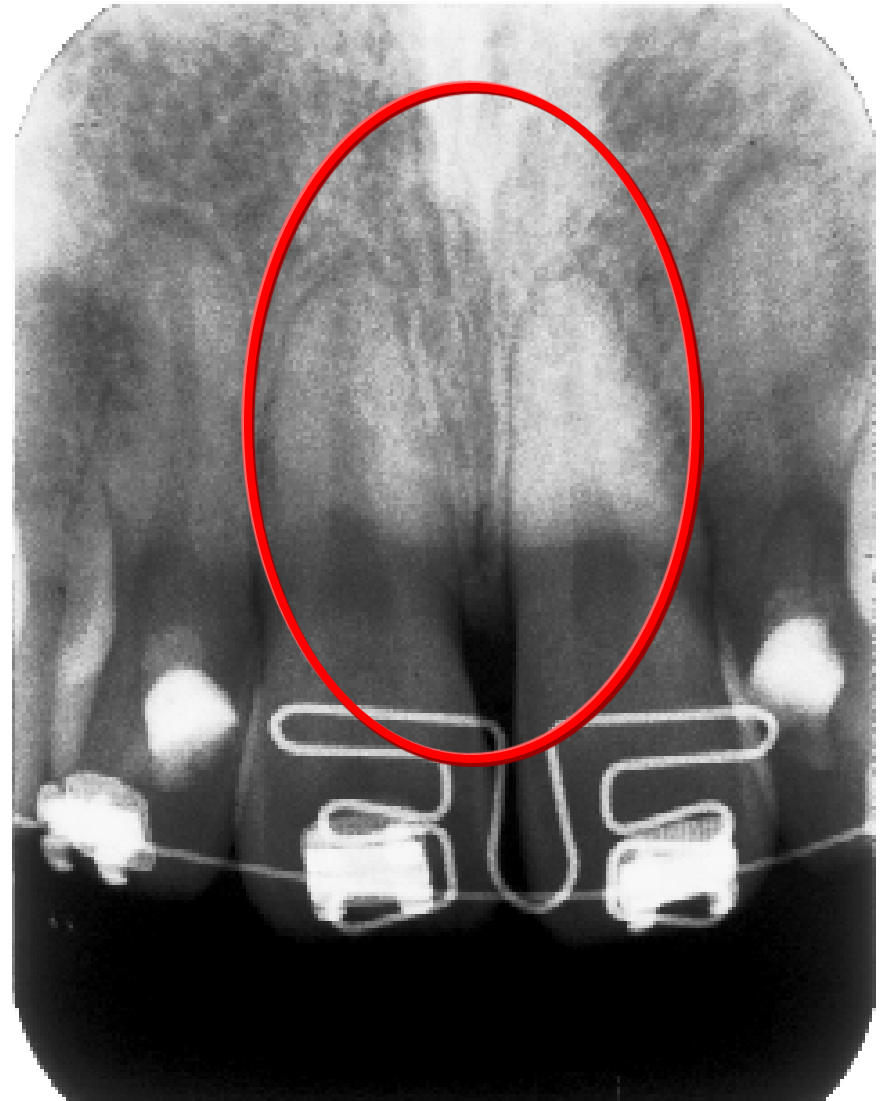
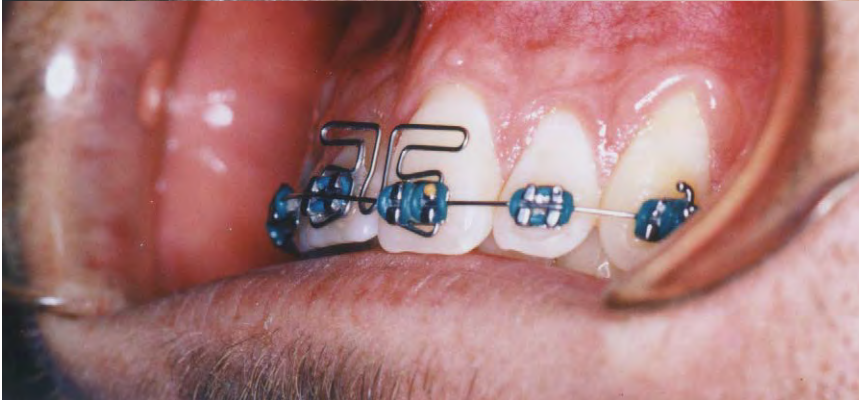
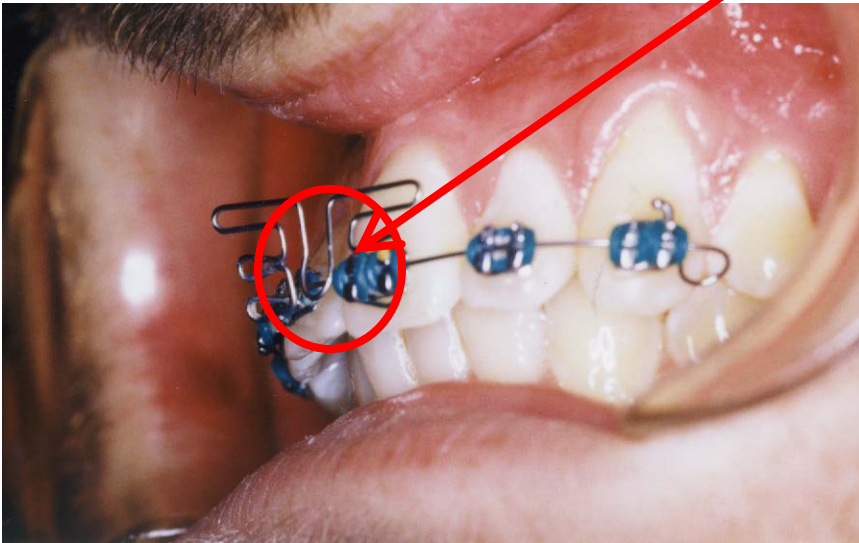


# Pre-treatment photos and x-ray

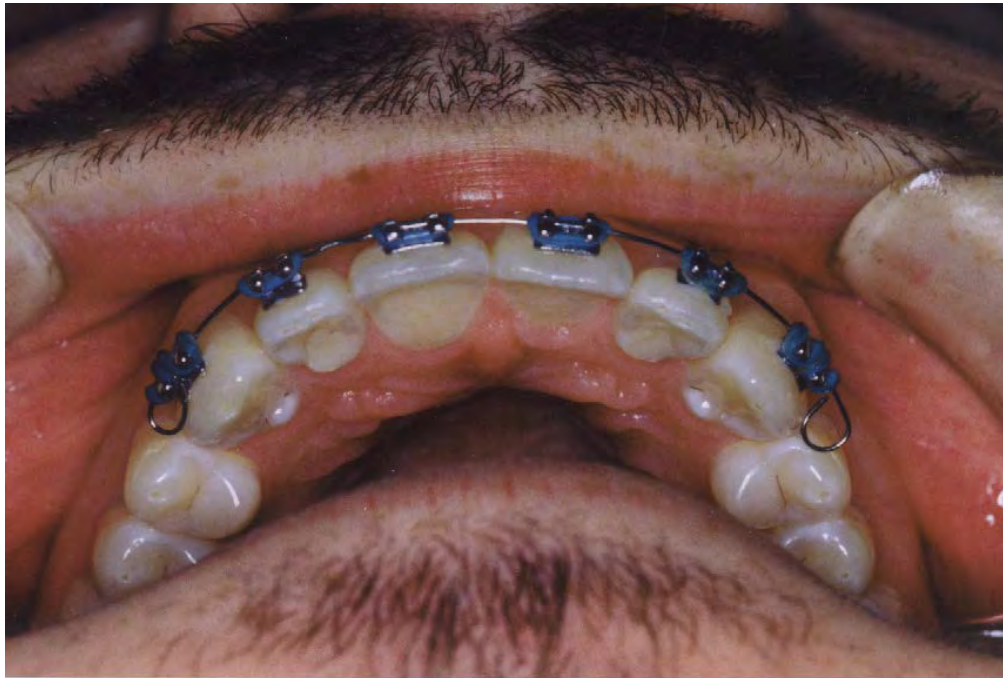


## Progress at 25 days

View of **VECTOR III®** spring after it was removed & activated then replaced at 25 days.



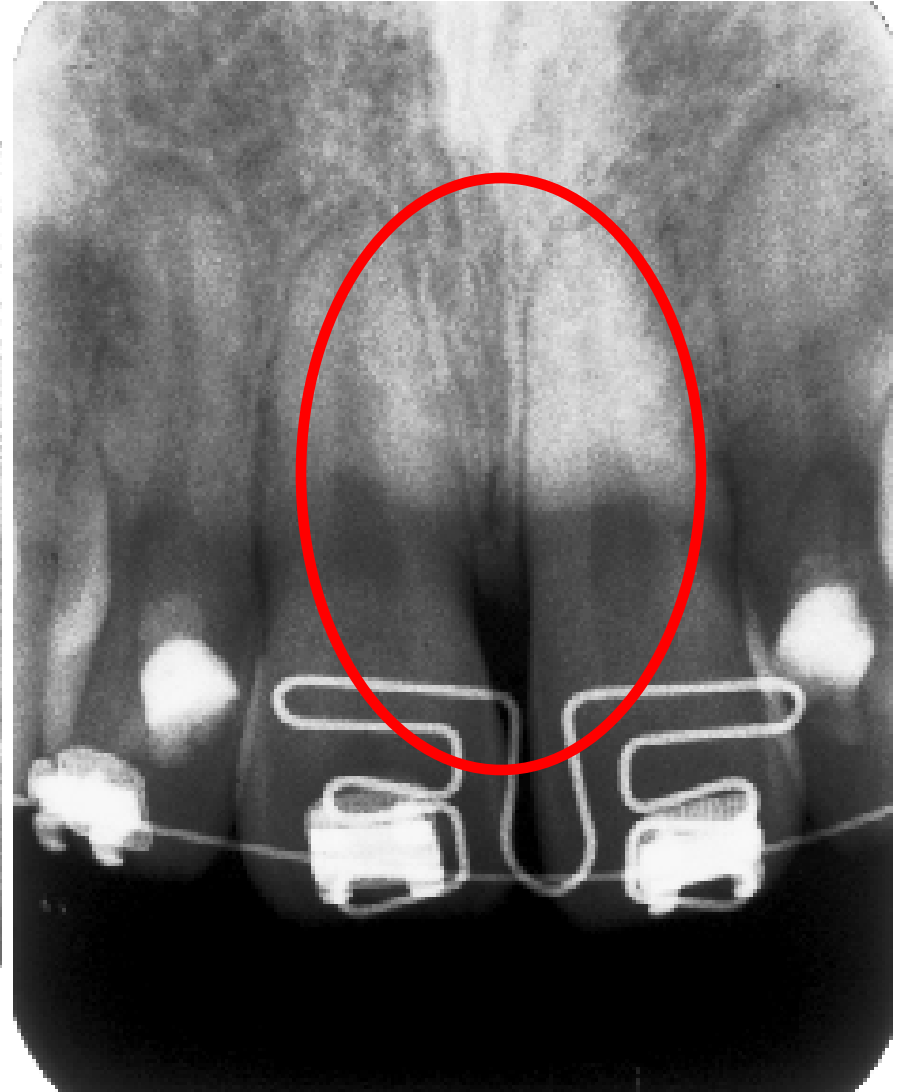
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Start



Progress 25 days



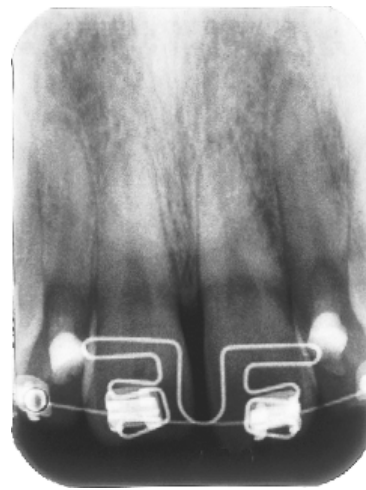
2-11 start



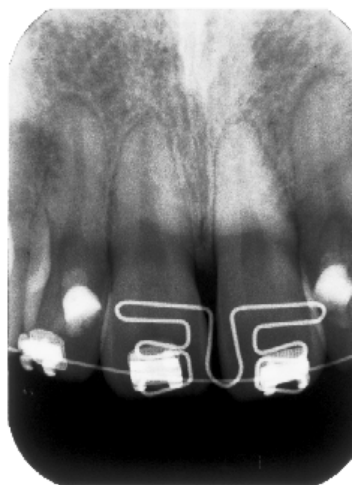
2-22 11 days



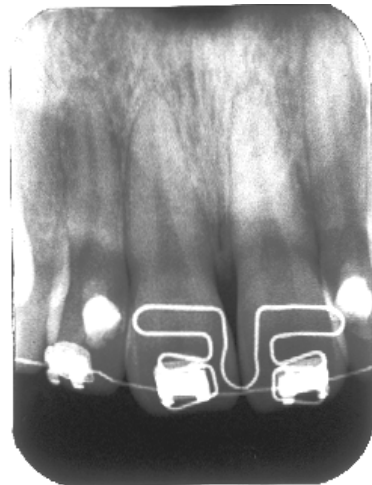
14 days  
2-25 14 days - severe angle



3-8 25 days



4-26 2 M + 15 D



7-8 4M + 28 D



8-12 6M + 1 D



BioAnalytic™ mechanics

Living Functional Factor +

Vectorloy™ Wire

= Revolutionary Results

It has generally been accepted that orthodontic treatment would be divided into half clinical treatment of the malocclusion and the other half of the treatment time managing the side effects of the treatment. To significantly reduce side effects would logically reduce treatment time and potentially enhance the treatment result. This potentially could positively impact retention of treated cases.

We define the specialty of orthodontics to be the art and science of diagnosing and treating malocclusions. When recognizing the considerable education of orthodontic specialists both in didactic (the science) and the clinical skills (the art) the side effects, the treatment time and the retention stability become an integral part of the clinical management or the art portion of orthodontics as a specialty.

Historically the lack of specialist training presented limitations and challenges in orthodontic clinical management of patients. Often practitioners would make statements in recognition of their limitation with the statement “We only do the easy cases and refer out the others”. This statement would seem to be responsible and yet does not address or negate the art and science differences in formal training as such. To address the art and science standard of care as practiced by the orthodontic specialist currently would seem to be a logical base (reference point).

With an effort to be politically correct and at the same time accurate, we will endeavor to present the **VECTOR III®** REVOLUTION not EVOLUTION in relation to new science and new clinical management/treatment of patients. This material may not be comprehensive in its’ scope but could be considered a “superficial overview”. The **VECTOR III®** textbook Volume I and Volume II will afford an extensive and comprehensive information source for your awareness and judgment. Please note this material is revolutionary over any orthodontic graduate program in the past and present. It is hoped it will implement a significant advancement in the future of orthodontics both in science and clinical/treatment/ management.



# NEW SCIENCE:

1. **VECTOR III®** THEOREM
2. **VECTOR III®** HYPOTHESIS
3. **VECTORLOY™** WIRE

GOOD NEWS FOR ORTHODONTIC SPECIALISTS AND GENERAL DENTISTS ALIKE

A PREMISE TO CONSIDER:

- A) If the new science is in the appliance.
- B) **BioAnalytic™** mechanics and **VECTORLOY™** Wire are incorporated into the **VECTOR III®** support products. This revolutionary clinical treatment/management of orthodontic patients realistically could reduce the treatment side effects and thus 50% (+-) of treatment time.

THUS: 24-30 months as per the AAO down to

12-24 months per 100 patients with **VECTOR III®**.

- C) Good news, the new science as to how it works and why is far less of a commitment of time and funds as compared to a Graduate Orthodontic Program. The important factor being that it affords the General Practitioner and the Orthodontic Specialist a higher standard of care than current conventional orthodontic treatment.

## COMMENTARY:

1. Bone in the leg vs. alveolar bone.
  - A. Matrix and bone mineralization are the same.
  - B. The blood supply is the same in the same individual.
2. The question is why is alveolar bone then a special purpose bone?
3. The human femur bone responds to the forces of vertical stress and horizontal strain by the bone remodeling at 90 degrees to stress/strain.
4. An area to consider for a possible answer could be environmental vector forces.

### 5. **The VECTOR III® Hypothesis:**

By appropriately applying Newton's Law III and Wolff's Law, so as to interact synergistically in 3 planes of space concomitantly, it is feasible to remodel the supporting alveolar bone in such a way as to move the tooth with its' socket and supporting bone as a physiologic unit.

6. In the evolution of man there have never been vector forces in three planes in space applied to the human dentition, at the same time, even by the specialty of orthodontics.
7. The clinical orthodontic start/progress photos and x-rays show a significant difference in the bone response in this short presentation. It, however, is to be noted that the clinical results have been consistent in the large number of treated cases by different clinicians.
8. Additional clinical treatment would provide data to be evaluated and research done and published. There may be sufficient data to consider a 1<sup>st</sup> publication at this time.

Any individuals or groups that finds this information interesting and or would like additional information and options to consider contact Dr. "Bud " at 262-763-5023. Also there is more information at [www.VECTOR IIIORTHO.com](http://www.VECTOR IIIORTHO.com).