

COMBINATION OF ORTHODONTICS AND ORAL SURGERY FOR TREATMENT OF OBSTRUCTIVE SLEEP APNEA



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Apple Creek Orthodontics of Appleton
Elin@osgb.com***

Peer-Reviewed and Indexed

Compendium

of Continuing Education in Dentistry

Dental Sleep Medicine

Diagnostic, evaluation, and treatment approaches

Stephen Poss, DDS

Total Volume:
12.6cc

Min Area:
306.8mm²

PLUS:

CE: Characteristics of Teeth: Size, Shape, Composition

Steve McGowan, CDT

CE: Halitosis Diagnostics

Murat Aydin, DDS, PhD;
Curd ML Bollen, DDS, PhD, MSc; and
Murat Eren Özen, MD

Special Report

Impression Materials/Systems

Howard E. Strassler, DMD

Web Presence Solutions

p.149

ORTHODONTICS

- ***DEFINITION OF ORTHODONTICS – “THE DIAGNOSIS, PREVENTION, AND TREATMENT OF DENTAL AND FACIAL IRREGULARITIES OTHERWISE KNOWN AS DENTOFACIAL ORTHOPEDICS.”***
- ***MODIFICATION OF GROWTH IN ORTHODONTICS IS AN ESSENTIAL COMPONENT OF TREATMENT FOR SKELETAL, FACIAL, AND AIRWAY DEVELOPMENT OF THE MAXILLA AND MANDIBLE. HOWEVER, TIMING OF ORTHODONTIC TREATMENT IS CRITICAL!!!***

ORTHODONTICS 101

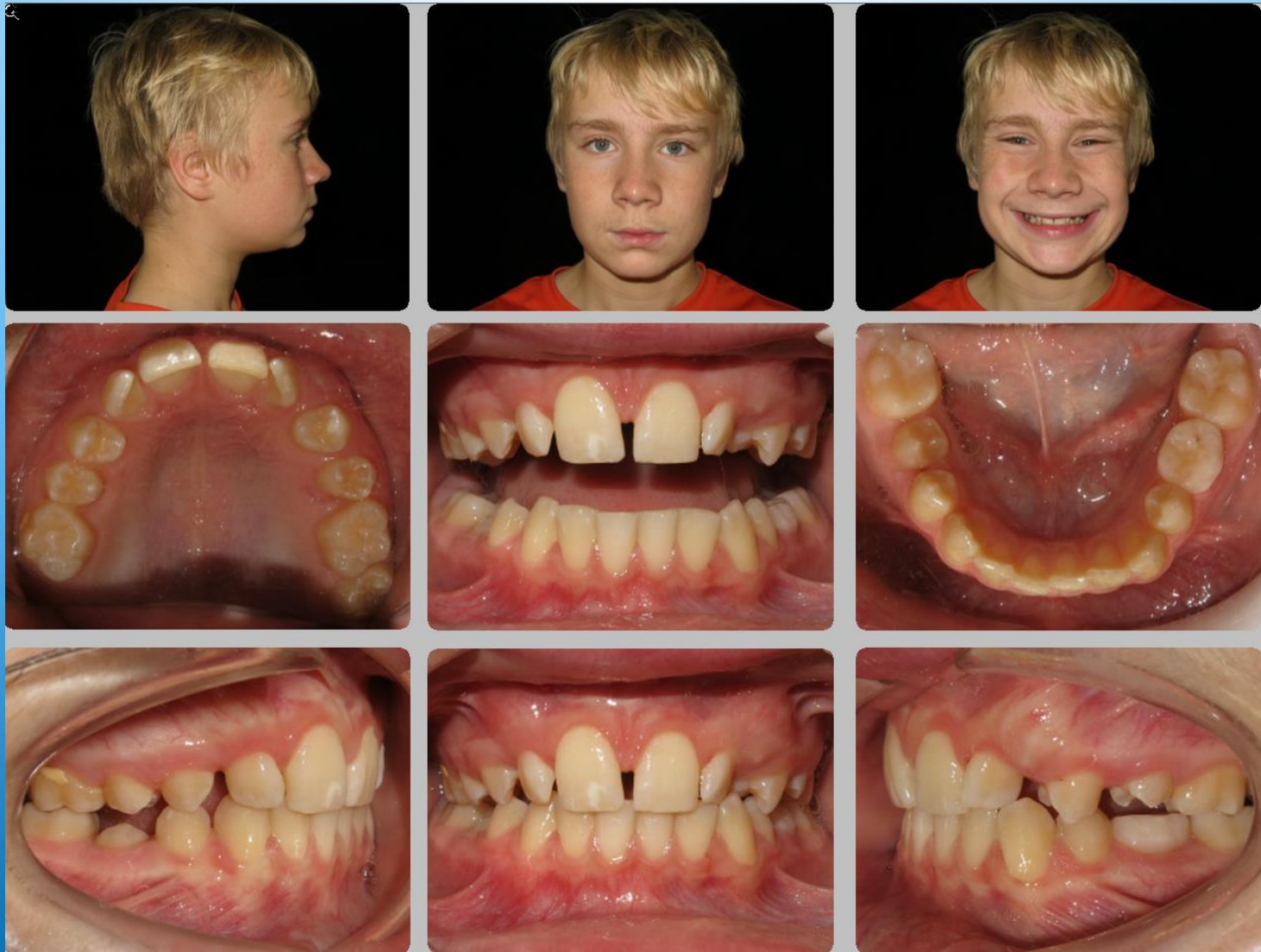
- **CLASS I= NORMAL BITE/OCCLUSION, CLASS II=OVERBITE, CLASS III=UNDERBITE**
- **OVERBITE (OB) = OVERLAP OF THE UPPER INCISORS OVER THE LOWER INCISORS . IDEAL IS CONSIDERED TO BE 20%.**
- **OVERJET (OJ) = THE AMOUNT OF SPACE BETWEEN THE UPPER AND LOWER INCISORS IN MILLIMETERS IN AN ANTERIOR POSTERIOR DIRECTION. IDEAL IS CONSIDERED TO BE 1-2 MM.**
- **POSITIVE OJ = CLASS I OR CLASS II. NEGATIVE OJ = CLASS III.**

ORTHODONTICS 101

- **PHASE I TREATMENT: EARLY TX IN THE MIXED DENTITION STAGE (~AGE 7-11) TO ADDRESS A SPECIFIC PROBLEM. THE BENEFIT WITH PHASE I TX IS IN CATCHING A PROBLEM EARLY TO MAKE CORRECTION EASIER. GROWTH MODIFICATION IS A MAJOR COMPONENT TO PHASE I TX.**
- **PHASE II TREATMENT: PATIENTS THAT HAVE GONE THROUGH PHASE I TX AND HAVE NOW TRANSITIONED INTO THE ADULT DENTITION STAGE (~AGE 11-14). GROWTH MODIFICATION IS ALSO A MAJOR COMPONENT TO TREATMENT IF STILL NECESSARY.**
- **FULL ORTHODONTIC TREATMENT – ONE PHASE OF TREATMENT FOR ADOLESCENTS AND ADULTS FOR DENTAL AND SKELETAL CORRECTION WHICH SOMETIMES INVOLVES ORTHOGNATHIC SURGERY.**

Why Go 3D???

JJ – Initial Records 10/29/15



Why Go 3D???

JJ – Initial Records 10/29/15

Patient's physician: Dr. Matt Theado, Bellin

Patient's dentist: Dr. Eric VanMiller, Park West

Is patient currently under a physician's care? If yes, describe medical condition: well visits, occasional asthma symptoms

Is pre-medication needed for dental appointments? No

List all medications/drugs/pills currently being taken: Occasional use of albuterol inhaler

List any allergies or sensitivities (drug/food/environmental): Environmental - various

Has patient experienced any severe head or facial injuries, including trauma to the teeth? If yes, please describe:
Age 2 - broke front tooth in fall, had to be surgically removed

Is there a mouth breathing or snoring habit?: Sometimes

Do you ever wake up at night? Yes If so, how often? _____

Have you been diagnosed with sleep apnea? No

Do you use a CPAP machine or wear a sleep appliance due to sleep apnea? N/a

Why Go 3D???

JJ – Initial Records 10/29/15



Edward Y. Lin, DDS, MS | Lee S. Bialkowski, DDS

Medical & Dental History continued

1839 Scheuring Road, De Pere, WI 54115

2821 South Webster, De Pere, WI 54115

T 920.336.2299 F 920.347.1872 E osgb@osgb.com

T 920.336.2299 F 920.336.2847 osgb.com

Patient Name: _____

Please check all boxes that apply if you are presently or have been treated in the past for any of the following:

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> Heart problems | <input type="checkbox"/> Benign tumors | <input type="checkbox"/> Periodontal (gum) disease | <input type="checkbox"/> Breathing disorders |
| <input type="checkbox"/> Heart murmur | <input type="checkbox"/> Malignant tumors | <input type="checkbox"/> Use of tobacco products | <input checked="" type="checkbox"/> Asthma |
| <input type="checkbox"/> Rheumatic fever | <input type="checkbox"/> Kidney problems | <input type="checkbox"/> Emotional problems | <input type="checkbox"/> Ear tubes placed |
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Glandular problems | <input type="checkbox"/> Fainting or dizziness | <input checked="" type="checkbox"/> Tonsils removed |
| <input type="checkbox"/> Arthritis | <input type="checkbox"/> Ulcers | <input type="checkbox"/> Epilepsy | <input checked="" type="checkbox"/> Adenoids removed |
| <input type="checkbox"/> High blood pressure | <input type="checkbox"/> Cancer | <input type="checkbox"/> Urogenital disease | <input type="checkbox"/> Glaucoma |
| <input type="checkbox"/> Bleeding disorders | <input type="checkbox"/> Hepatitis | <input type="checkbox"/> Convulsions/seizures | <input type="checkbox"/> Cleft lip or palate |
| <input type="checkbox"/> Venereal disease | <input type="checkbox"/> Trauma | <input type="checkbox"/> Genetic disorders | <input type="checkbox"/> Other (explain on next page) |
| <input type="checkbox"/> AIDS | <input type="checkbox"/> Latex allergy | <input type="checkbox"/> Tuberculosis | |
| <input type="checkbox"/> HIV | <input type="checkbox"/> TMJ (jaw joint problems) | <input type="checkbox"/> Sleep disorders | |
| <input type="checkbox"/> Previous orthodontic treatment,
name of orthodontist: _____ | | | |

Any medical condition, not mentioned on previous page, for which you have been diagnosed and/or treated?
Please explain:

Eczema

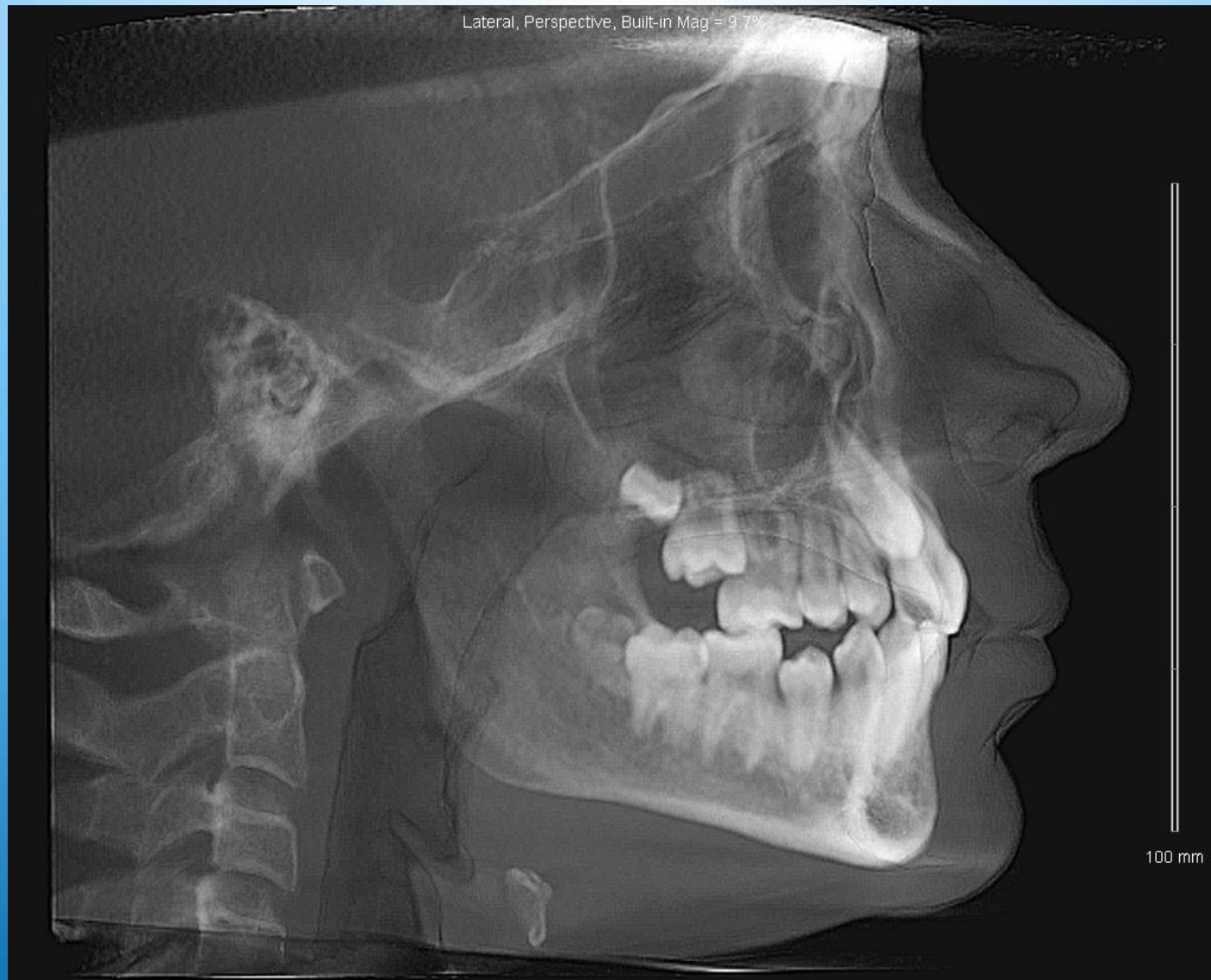
Why Go 3D???

JJ – Initial Records 10/29/15



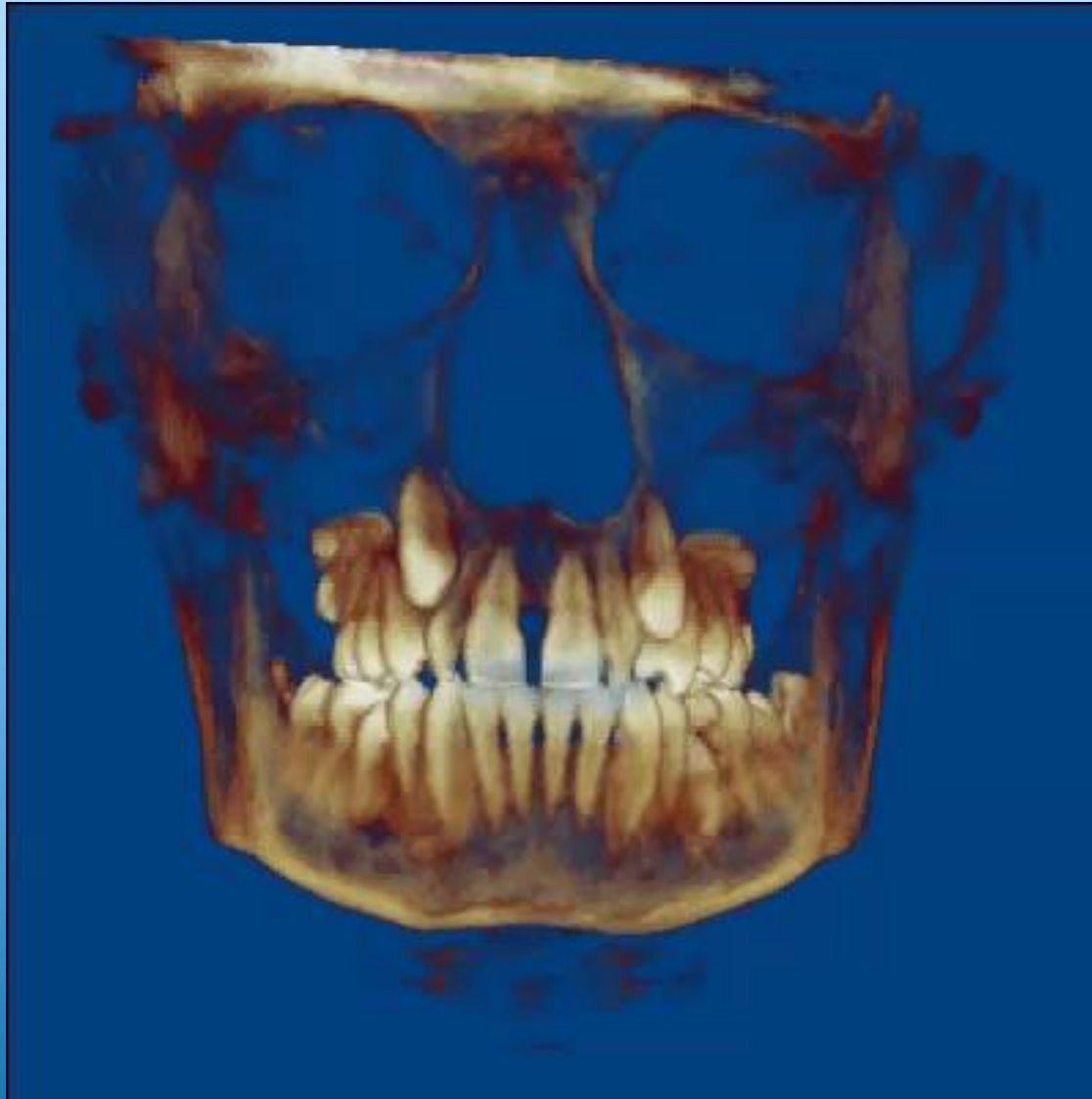
Why Go 3D???

JJ – Initial Records 10/29/15



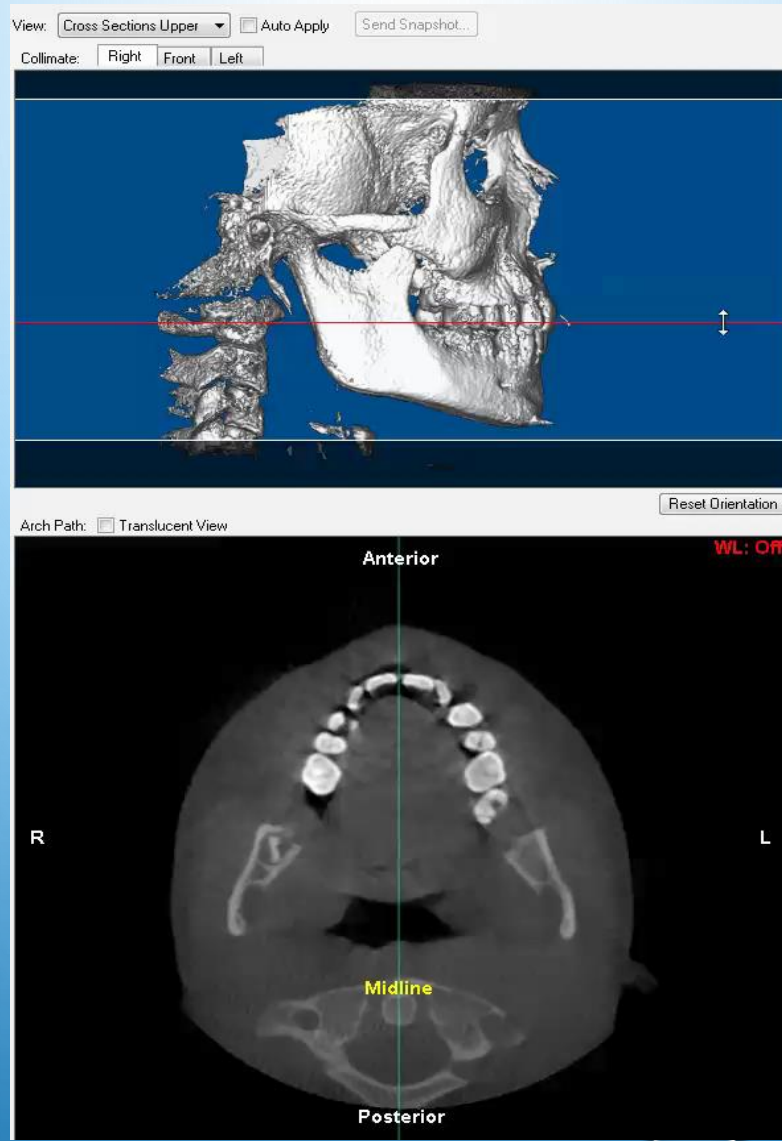
Why Go 3D???

JJ – Initial Records 10/29/15



Why Go 3D???

JJ – Initial Records 10/29/15



Why Go 3D???

JJ – Initial Records 10/29/15

Exam: Patient is alert and oriented. Face is symmetric, nontender on palpation. Voice is good. Patient is in no acute distress; no increase in respiratory effort. Extraocular muscles intact. No edema, vascular dilation. Skin of face and neck is healthy. Patient is mouth breathing throughout the appointment. External ears and ear canals clear, tympanic membranes mobile without erythema. Hearing grossly normal.

NOSE: Septum severely deviated to the left resulting in greater than 75% obstruction; turbinates nonhypertrophied. No rhinorrhea, crusting, bleeding or purulence. External nares without deformity.

Johnson, Jared James Printed at 11/12/15 4:49 PM

Page 1 of 5

Assessment:

DNS (deviated nasal septum) (primary encounter diagnosis)

Comment: Patient has a suggestion of polyp or other mass on exam and on iCAT; suspect possible Chronic ethmoidal sinusitis

Plan: CT SINUS WO CONTRAST, REPAIR OF NASAL SEPTUM

Recommend septoplasty and further evaluation of the sinuses preoperatively with CT scan. Risks of septoplasty including bleeding, infection, discussed with the patient and his mother and they've requested surgery.

CC – 2/21/11 Initial Records

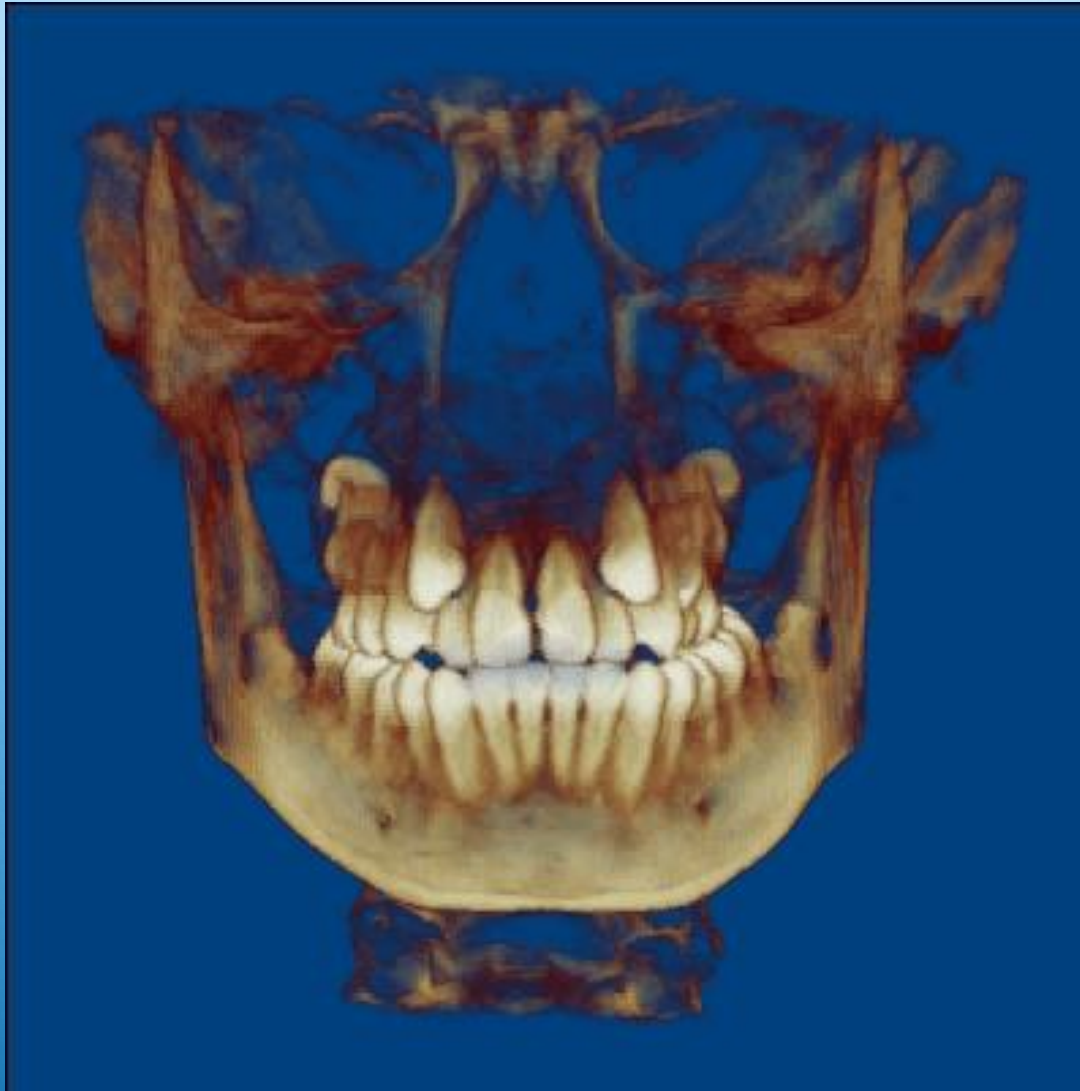
Age 12 yrs, 10 mos



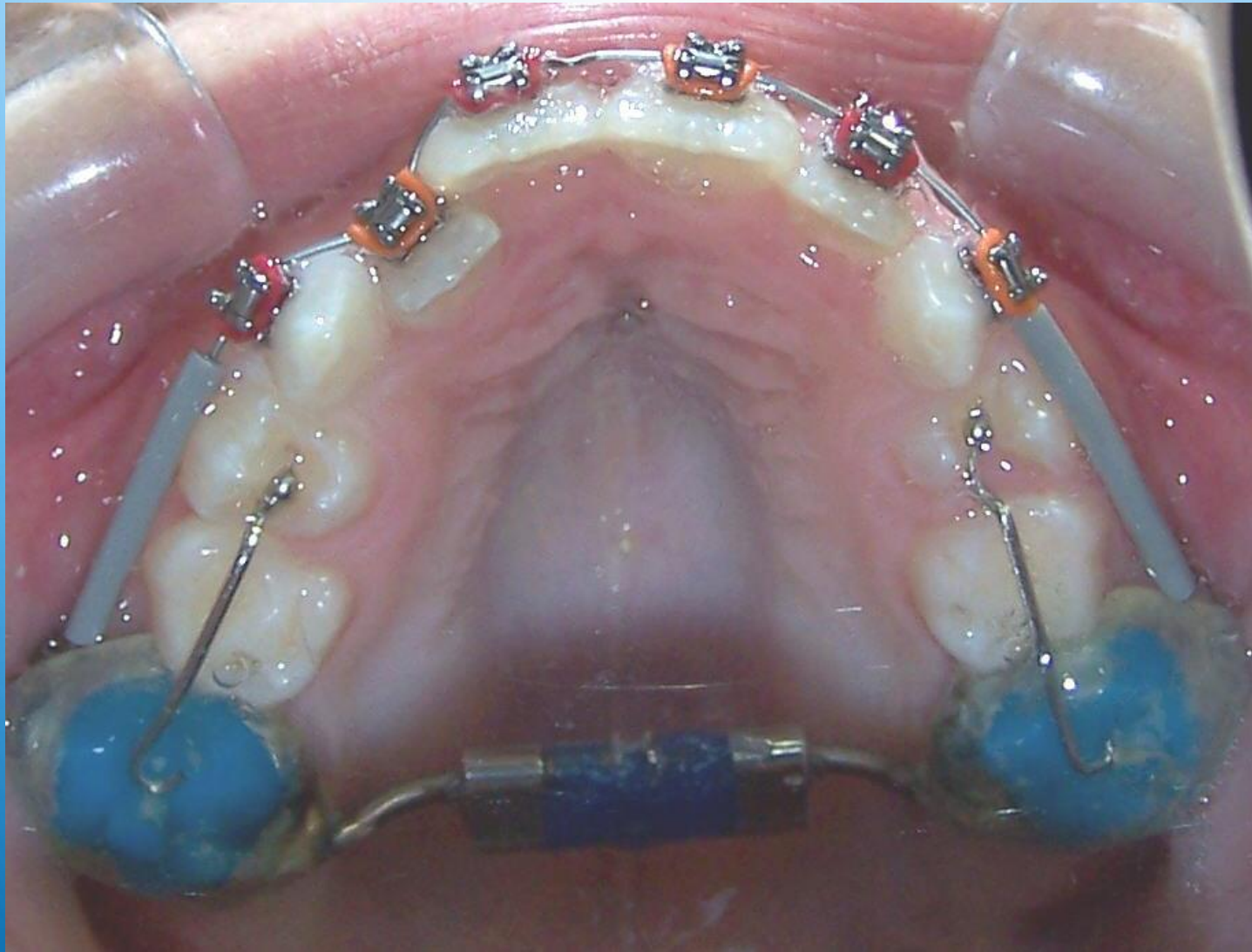
***CC – 2/21/11 Initial Records
Age 12 yrs, 10 mos***



CC – 2/21/11 Initial Records
Age 12 yrs, 10 mos



RAPID PALATAL EXPANSION



Dimensional changes of upper airway after rapid maxillary expansion: A prospective cone-beam computed tomography study



Yoon Chang,^a Lisa J. Koenig,^b Jessica E. Pruszyński,^c Thomas G. Bradley,^d Jose A. Bosio,^e and Dawei Liu^f
Milwaukee, Wis

CONCLUSIONS: These results confirm the findings of previous studies of the effect of rapid maxillary expansion on the maxilla. Additionally, we found that only the cross-sectional area of the upper airway at the posterior nasal spine to basion level significantly gains a moderate increase after rapid maxillary expansion.

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using paired *t* tests with the Bonferroni adjustment for multiple comparisons. **Results:** After rapid maxillary expansion, significant and equal amounts of 4.8 mm of expansion were observed at the first molar ($P = 0.0000$) and the first premolar ($P = 0.0000$) levels. The width increase at the first premolar level (20.0%) was significantly greater than that at the first molar level (15.0%) ($P = 0.035$). As the primary outcome variable, the cross-sectional airway measured from the posterior nasal spine to basion level was the only parameter showing a significant increase of 99.4 mm² (59.6%) after rapid maxillary expansion ($P = 0.0004$). **Conclusions:** These results confirm the findings of previous studies of the effect of rapid maxillary expansion on the maxilla. Additionally, we found that only the cross-sectional area of the upper airway at the posterior nasal spine to basion level significantly gains a moderate increase after rapid maxillary expansion. (Am J Orthod Dentofacial Orthop 2013;143:462-70)

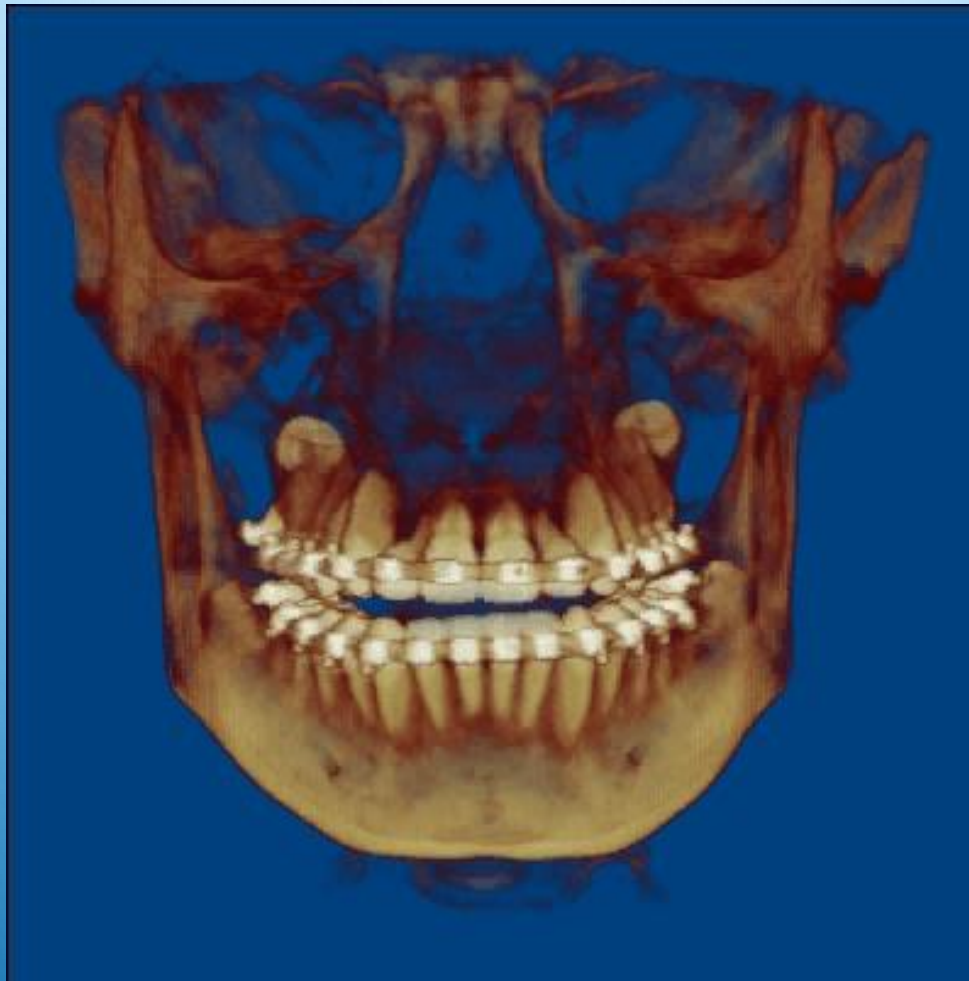
***CC – 7/11/11 Progress Records
3.1 Months TX***



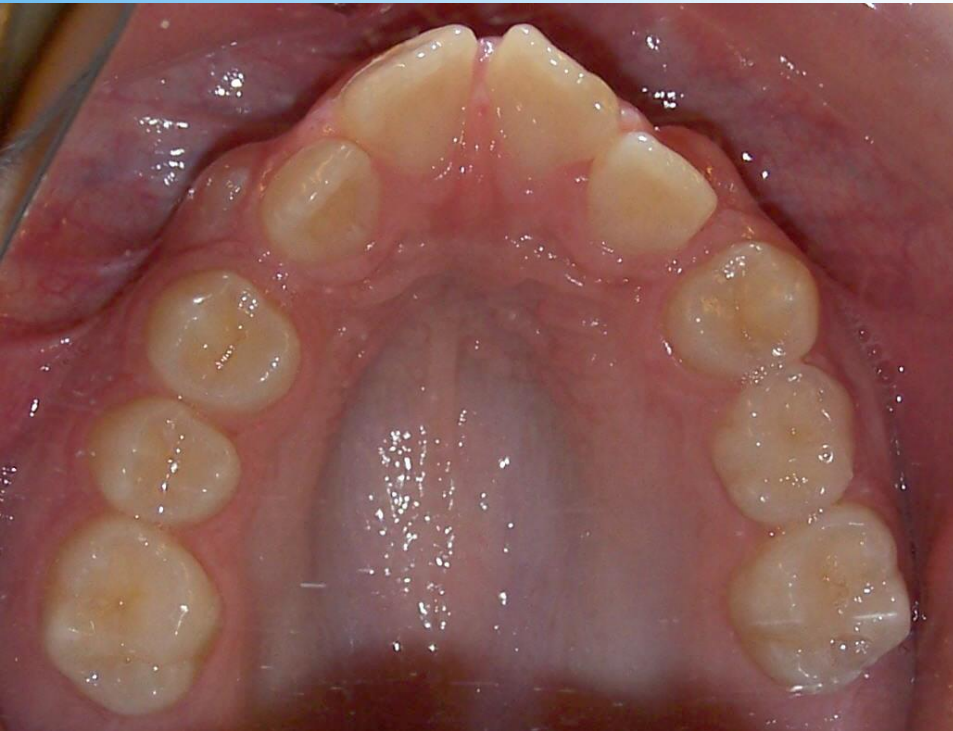
CC – 11/28/11 Progress Records
Impacted MX canines w/ Root Resorption of MX
lateral incisors
8.75 Months TX



***CC – 11/28/11 Progress Records
Impacted MX canines w/ Root Resorption of MX
Lateral Incisors
8.75 Months TX***



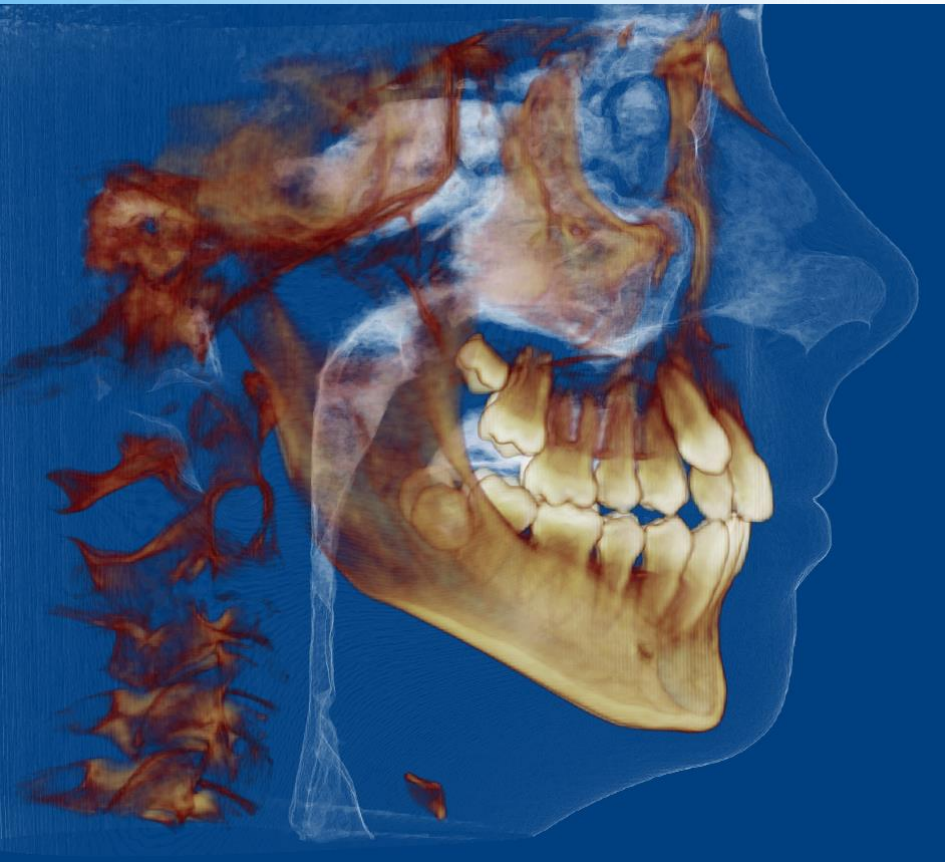
2/21/11



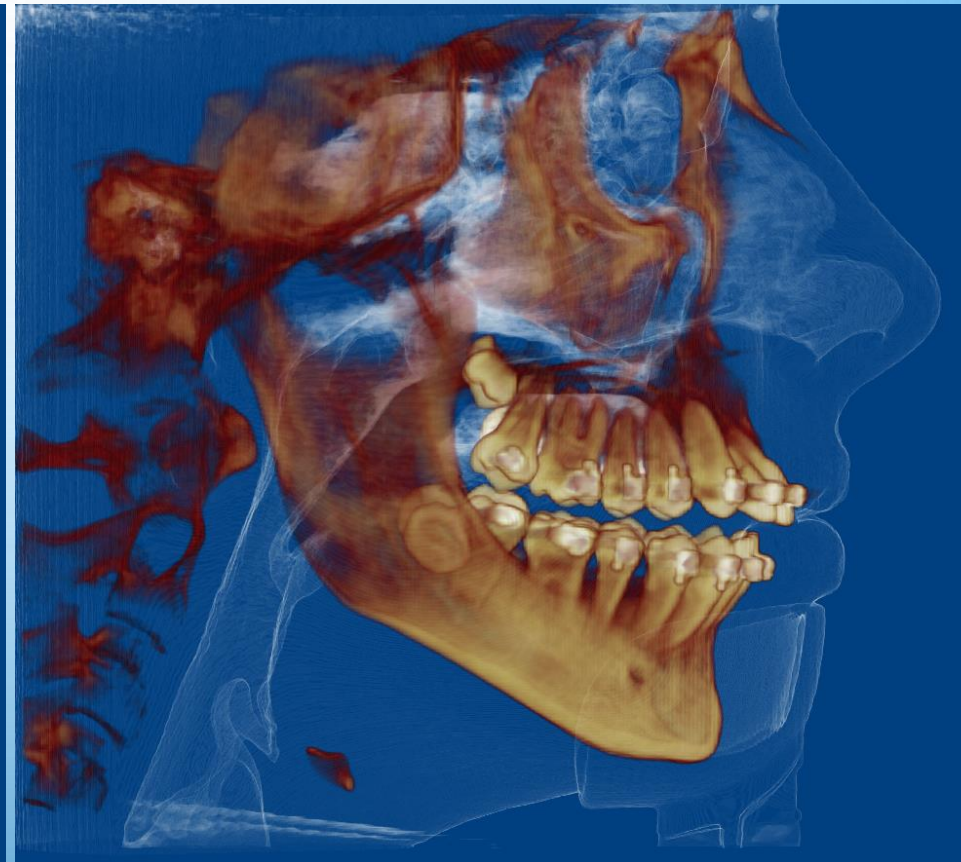
11/28/11



2/21/11



11/28/11





Clinical Orthodontics: A Great Future in Plastics by Dr. John Grady

Home > orthotown Magazine > September 2016 > Article

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A Great Future in PLASTICS

By graduating to CBCT and 3-D printing, you
can improve communication with OSA patients and practitioners

by Dr. John Grady

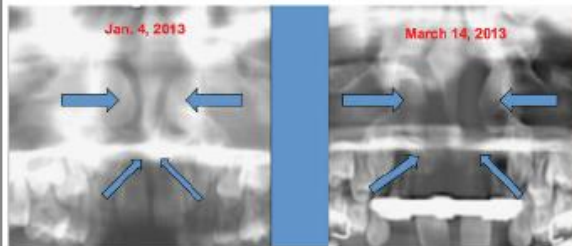


Fig. 1: Because a panorex (tomogram) is a two-dimensional angled slice, it may not always be representative of actual 3-D change. Take note of the intermaxillary suture. These films are typical images of rapid maxillary expansion (RME).



Fig. 2: On this 3-D maxillary model, the clear plastic represents bone and red plastic represents soft tissue.

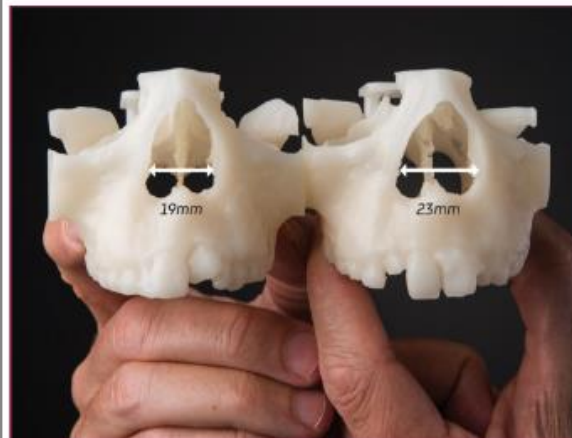


Fig. 3: These 3-D models, which represent a before-and-after case over a six-month time period, were printed to show only bone.

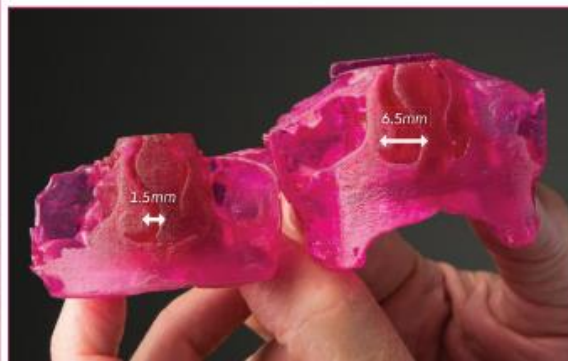
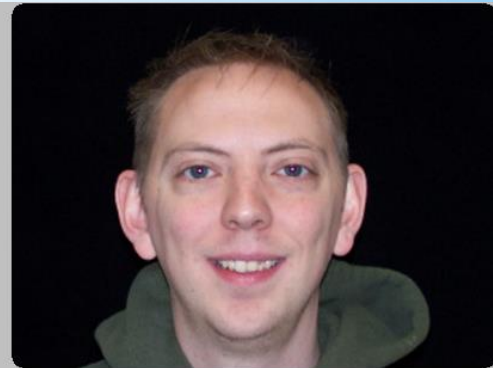
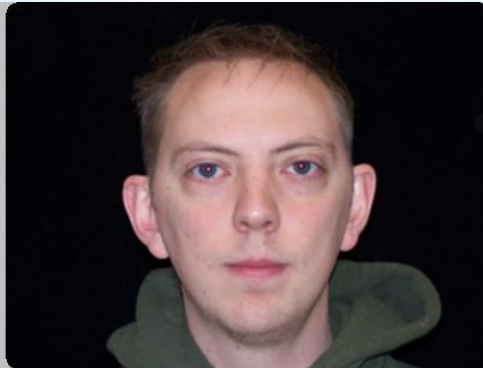


Fig. 4: Note the dramatic airway improvement post-RME on this 3-D model of a patient who had been diagnosed with severe sleep apnea despite two adenoidectomies. The patient's post-RME sleep study (PSG) was normal.

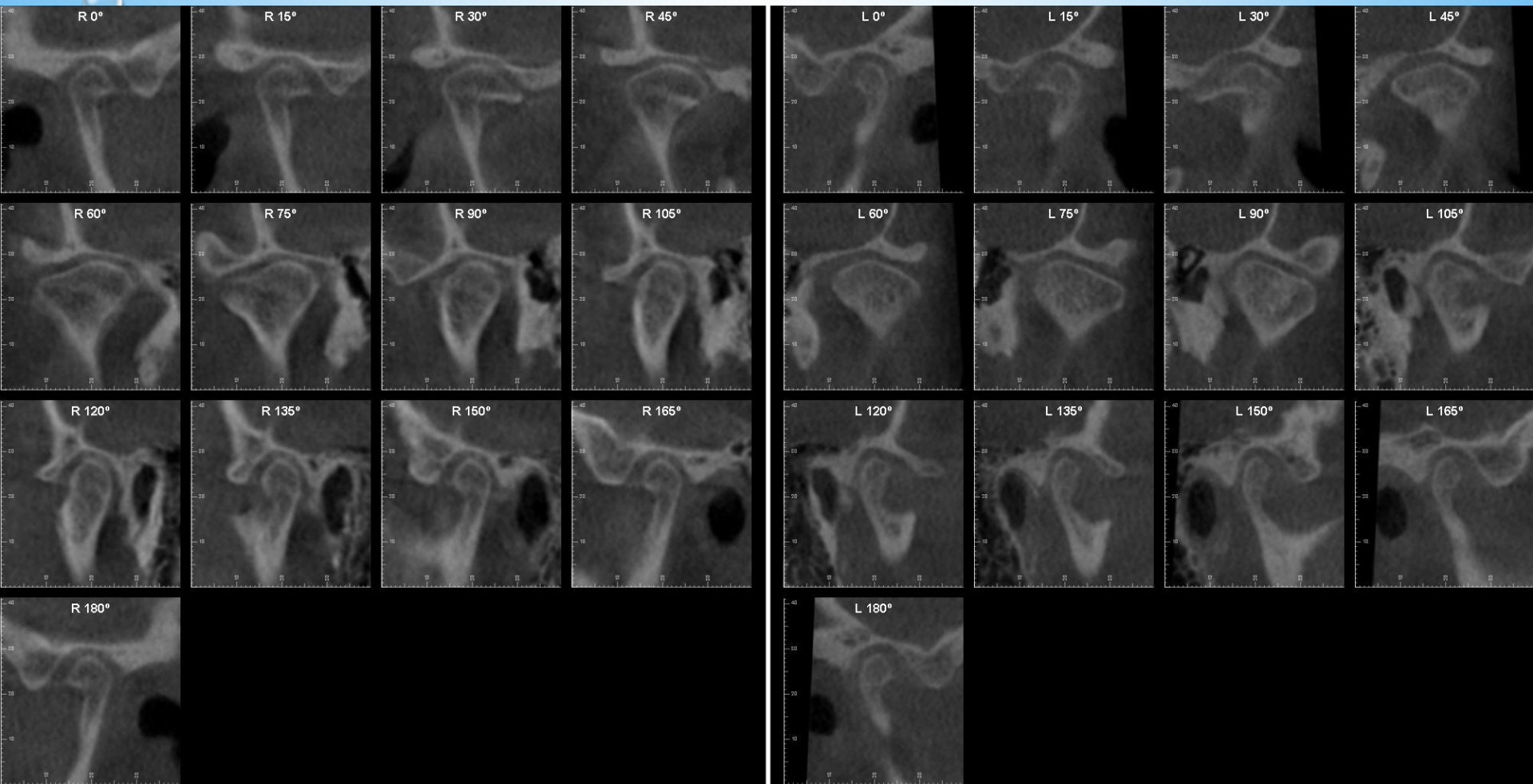
CL – 4/7/10 Age 29 yrs, 2 mos



CL – 2/20/14 Age 33 yrs, 1 mos



CL – 2/20/14



CL – 4/7/10

Age 29 yrs, 2 mos

CL – 2/20/14

Age 33 yrs, 1 mos



AM – 8/28/09 Initial Records

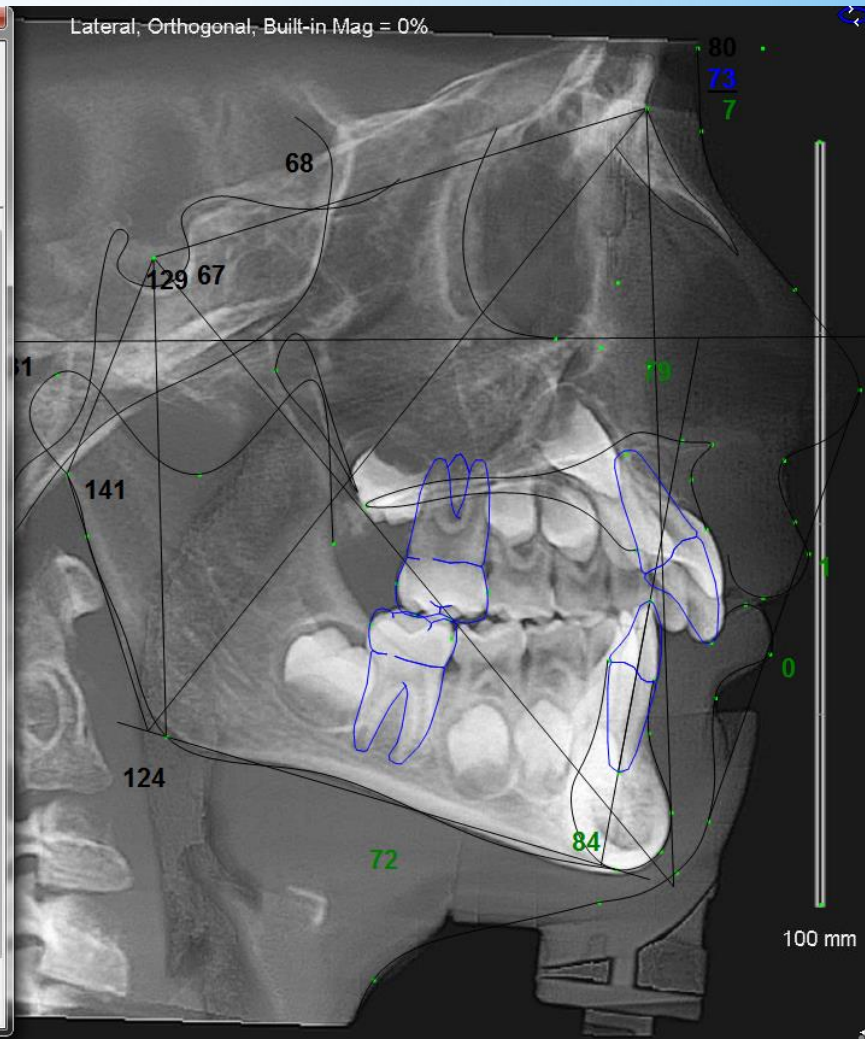
Age 8 yrs, 1 mos Class II w/ Deep Bite



AM – 8/28/09 Initial Records

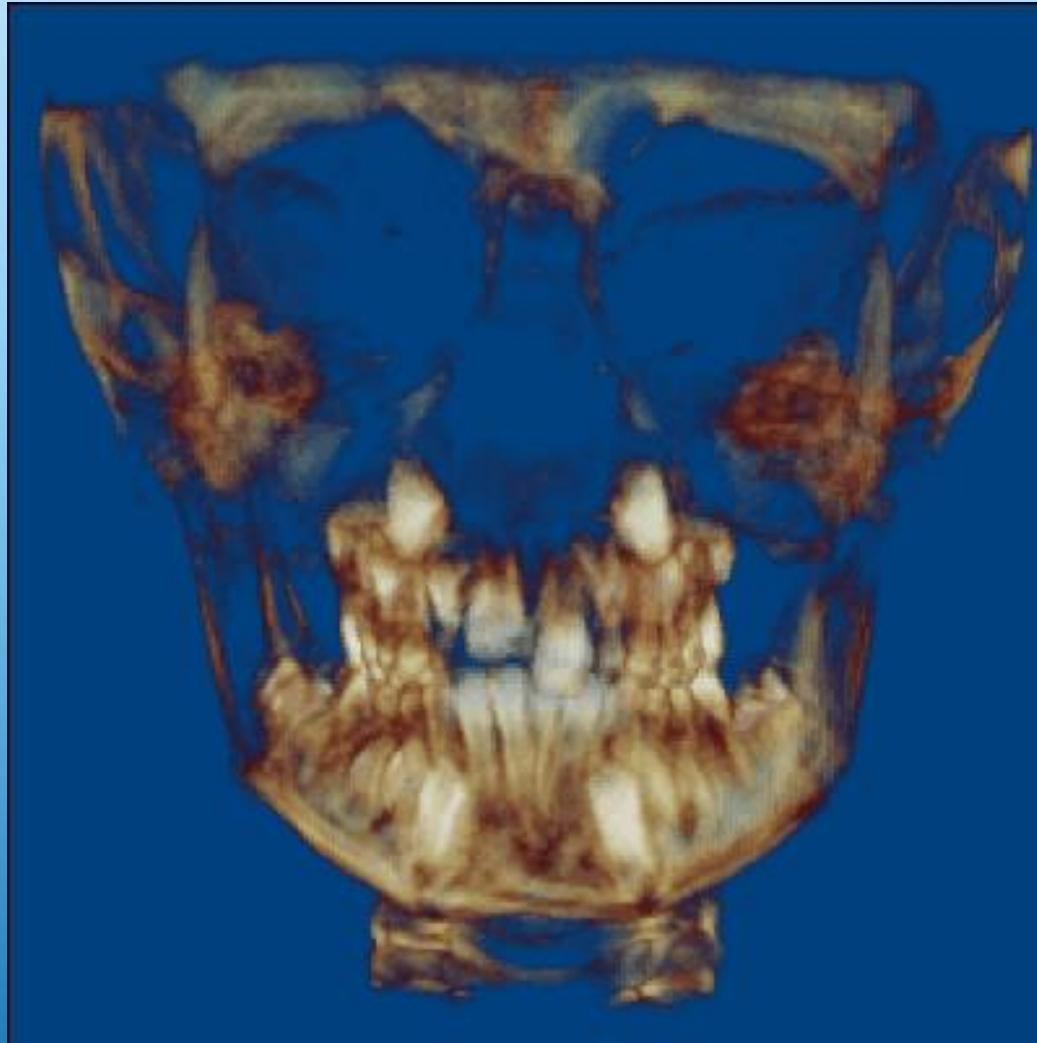
Age 8 yrs, 1 mos Class II w/ Deep Bite

Measurements					
Aaron Minino, ID: 042228					
Male Other, b. 9/26/2001 (age 14)					
Timepoint: initial/CAT...MMV		Close			
Image: Right X-Ray		Print			
Analysis: Jarabak		?			
Dev Norm: <input checked="" type="radio"/> Standard <input type="radio"/> Polygon/Wiggle-gram		<input type="checkbox"/> Hide Values <input type="checkbox"/> Use Same Color			
Group/Measurement	Value	Norm	Std Dev	Dev	Norm
CRANIAL BASE					
Saddle/Sella Angle (SN-Ar) (°)	128.6	124.0	5.0	0.9	
Anterior Cranial Base (SN) (mm)	67.6	70.6	3.0	-1.0 *	
Posterior Cranial Base (S-Ar) (mm)	30.6	30.2	4.0	0.1	
MANDIBLE					
Gonial/Jaw Angle (Ar-Go-Me) (°)	123.9	127.9	6.7	-0.6	
Mandibular Body Length (Go-Gn) (mm)	72.0	65.0	4.4	1.6 *	
Upper Gonial Angle (Ar-Go-Na) (°)	56.2	59.1	7.0	-0.4	
Lower Gonial Angle (Na-Go-Me) (°)	67.8	69.5	6.0	-0.3	
Ramus Height (Ar-Go) (mm)	35.3	37.9	4.5	-0.6	
A-P RELATIONSHIP					
SNA (°)	80.0	82.0	3.5	-0.6	
SNB (°)	73.4	80.9	3.4	-2.2 **	
ANB (°)	6.7	1.6	1.5	3.4 ***	
Convexity (NA-APo) (°)	10.3	10.6	3.0	-0.1	
CRANIAL BASE / MANDIBLE					
Articular Angle (°)	140.8	145.6	6.0	-0.8	
Sum of Angles (Jarabak) (°)	393.3	402.2	6.0	-1.5 *	
Jarabak Anterior Ratio (x100)	94.0	100.1	4.0	-1.5 *	
MP - SN (°)	33.3	33.0	6.0	0.0	
Nasion-Gonion Length (mm)	103.7	112.2	4.0	-2.1 **	
Y-Axis Length (mm)	107.1	109.8	6.0	-0.4	
Facial Plane to SN (SN-NPog) (°)	75.2	77.0	4.0	-0.4	
Posterior Face Height (SGo) (mm)	62.1	64.8	5.0	-0.5	
Anterior Face Height (NaMe) (mm)	99.9	104.8	5.0	-1.0 *	
P-A Face Height (S-Go/N-Me) (%)	62.2	65.0	4.0	-0.7	
Y-Axis (SGn-SN) (°)	67.2	67.0	5.5	0.0	
SKELETAL / DENTAL					
IMPA (L1-MP) (°)	84.1	95.0	7.0	-1.6 *	
FMIA (L1-FH) (°)	79.1	62.7	8.5	1.9 *	
L1 - Facial Plane (L1-NPo) (mm)	-1.8	2.6	2.0	-2.2 **	
U1 - NPo (mm)	6.0	5.0	2.0	0.5	
U1 - SN (°)	97.6	102.1	5.5	-0.8	
Mand Plane to Occ Plane (°)	15.3	14.6	5.0	0.2	
DENTAL					
Interincisal Angle (U1-L1) (°)	145.1	130.0	6.0	2.5 **	
SOFT TISSUE					

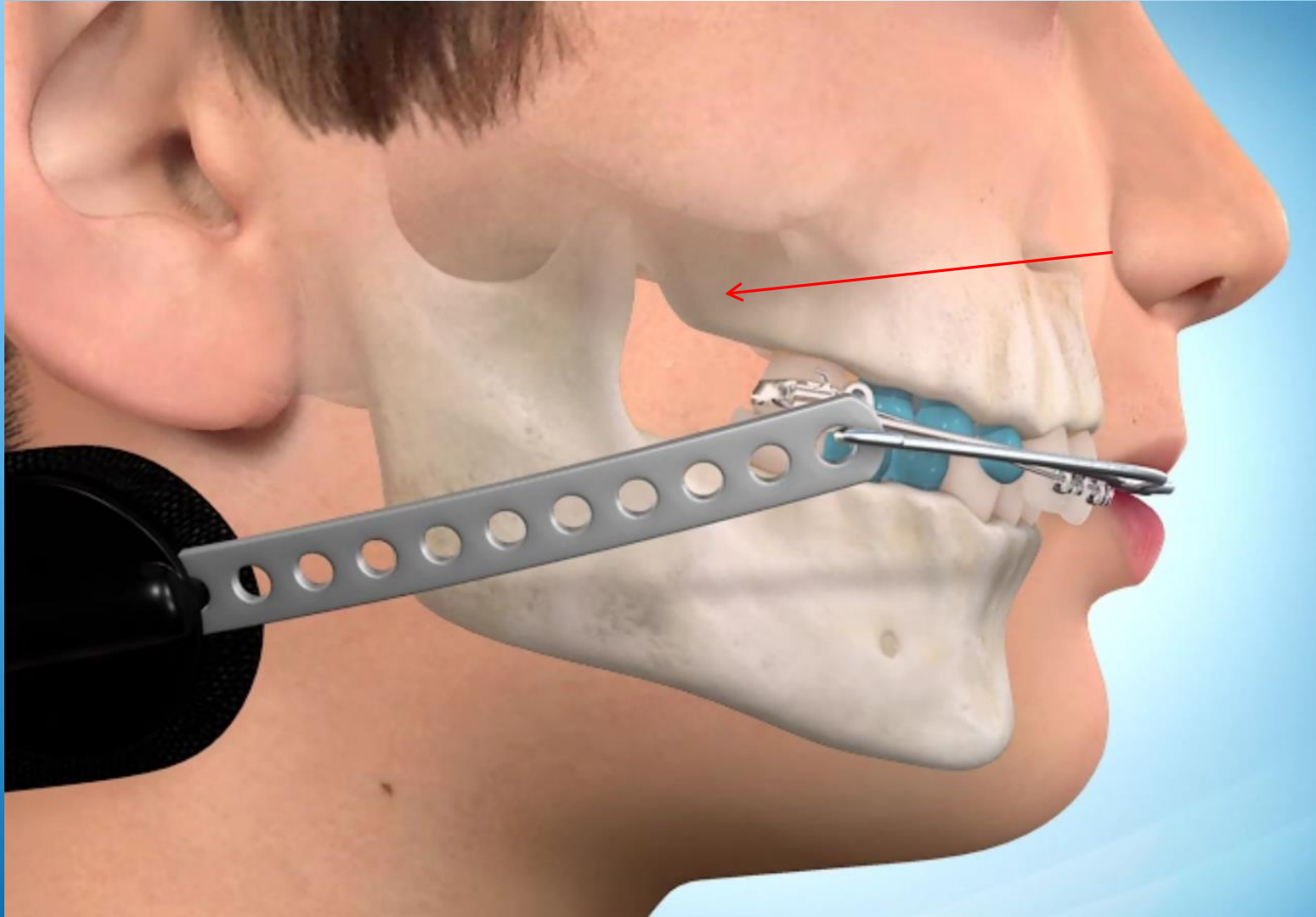


AM – 8/28/09 Initial Records

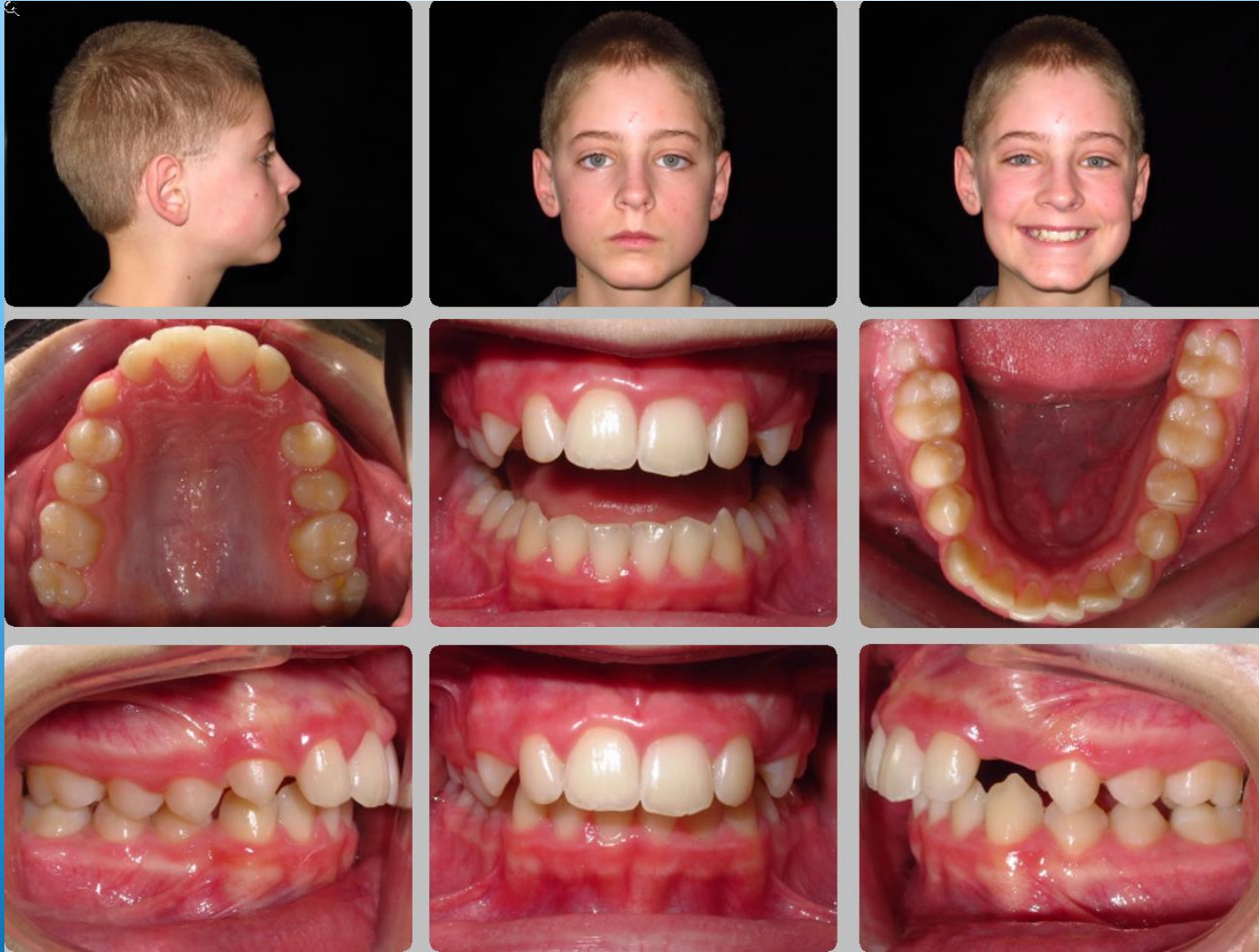
- Age 8 yrs, 1 mos Class II w/ Deep Bite***



PHASE I TX – CERVICAL TRACTION HEADGEAR



AM – 3/19/14 Phase II Records
Age 12 yrs, 6 mos Class II w/ Deep Bite



***AM – 5/27/15 Progress Records
Age 13 yrs, 8 mos 4.75 mos TX***



AM – 10/6/15

Age 14 yrs, 1 mos 9 mos FULL TX



AM – Debond 7/6/16

Age 14 yrs, 9 mos 17 mos, 29 Days Total TX



8/28/09

Age 8 yrs, 1 mos

3/19/14

Age 12 yrs, 6 mos

7/6/16

Age 14 yrs, 9 mos



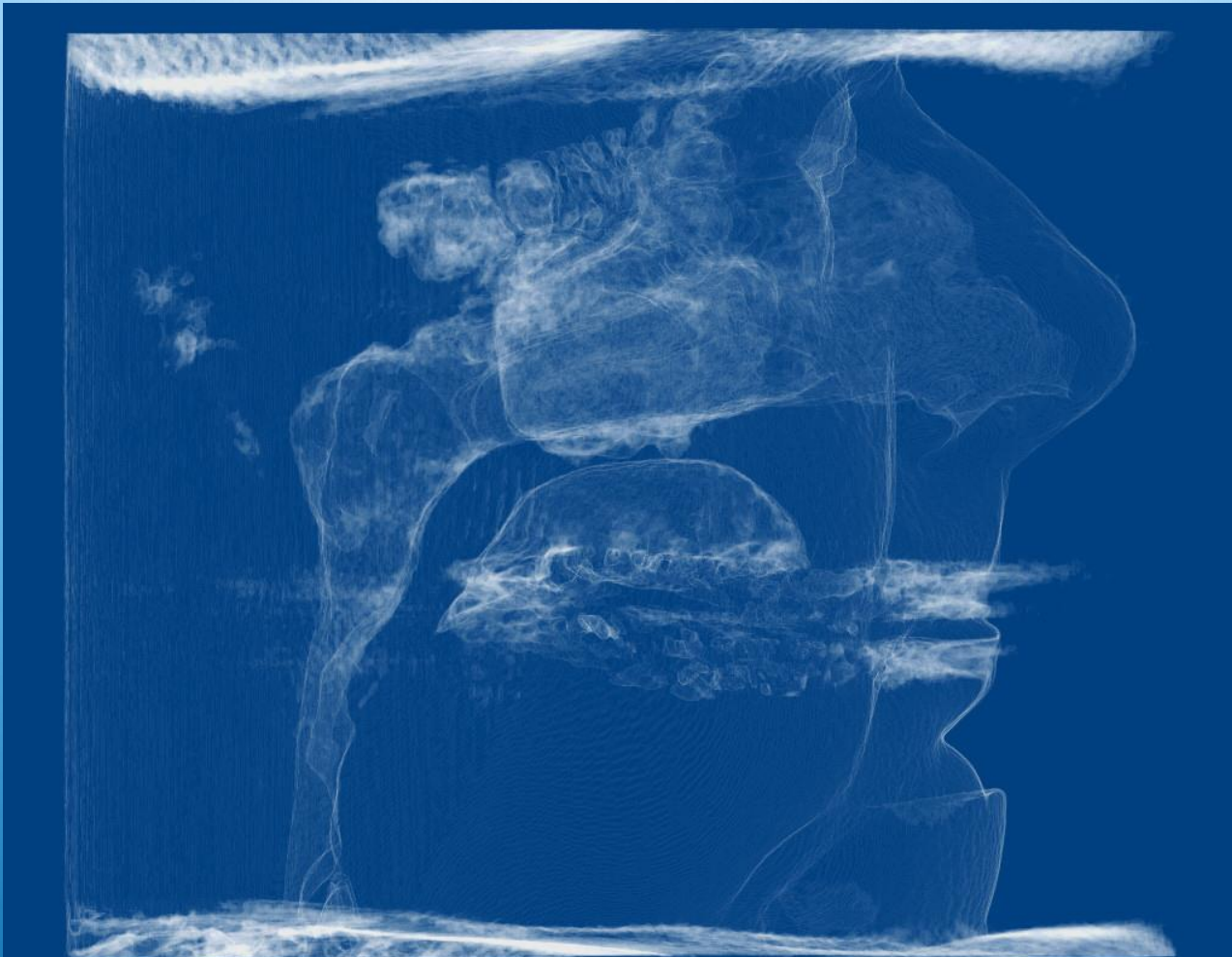
Negative Effects of Dental Sleep Appliances

JM – 5/4/16 Initial Records Age 56 yrs, 10 mos



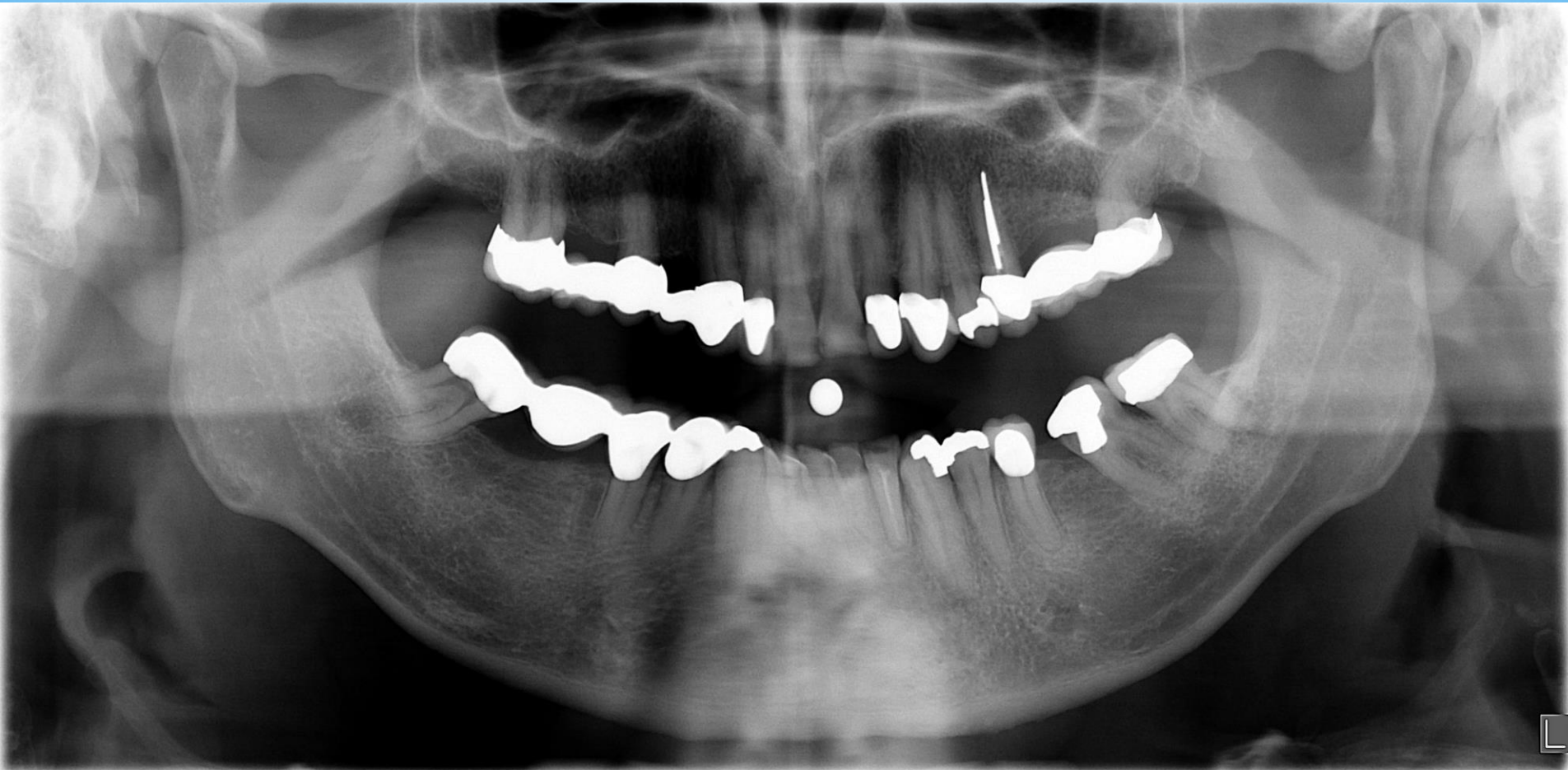
Negative Effects of Dental Sleep Appliances

JM – 5/4/16 Initial Records Age 56 yrs, 10 mos



Negative Effects of Dental Sleep Appliances

JM – 5/4/16 Initial Records Age 56 yrs, 10 mos



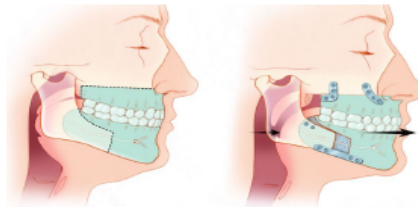
Orthognathic Surgery – SURGICAL CORRECTION OF ABNORMAL JAW POSITION WITH ORTHODONTIC ASSISTANCE

Surgical Treatment for OSA

Surgical intervention may be a viable alternative for some OSA patients; however, it is important to keep in mind that every patient is different and there are multiple surgical options. Often, Drs. Kupferman and Walline may do surgery with your ENT doctor to achieve the best results. This may include surgery on your soft palate or tongue muscles.

MAXILLOMANDIBULAR ADVANCEMENT (MMA) -

CORRECTIVE JAW SURGERY FOR OSA



Maxillomandibular Advancement (MMA) - Correc- tive Jaw Surgery for OSA

MMA is a procedure that moves the upper and lower jaws forward. As the bones are surgically advanced, the soft tissues of the tongue and palate are also moved forward, opening the entire airway. Through minimally invasive techniques the jaws can be advanced to provide better breathing and a cure for moderate to severe sleep apnea. For some individuals, the MMA procedure is the only technique that can create the necessary air passage to resolve OSA symptoms.

MAXILLOMANDIBULAR ADVANCEMENT SX



ORTHOGNATHIC SX FOR OSA



**TX Start:
5/30/06**



Orthognathic SX for OSA



**Pre-SX
Records:
7/23/07**

13.75 mos TX



ORTHOGNATHIC SX FOR OSA

Dolphin Imaging 10.5 Premium [Registered to: Orthodontic Specialists of Green Bay] - Macco, Raelen ID: 037335

File Edit View Options Tools Window Help

Treatment Simulation (V10)

COCR TxPlan Goals << Less

Maxilla	A-P	Vert
ANS	0.0	0.0
PNS	0.0	0.0
Mx1 tip	0.0	0.0
Molar MB cusp tip	0.0	0.0

Mandible	A-P	Vert
Md1 tip	+3.4	-0.4
Molar MB cusp tip	+3.3	-1.3
B point	+2.7	-0.5
Pog	+5.7	-1.5
Genioplasty	+3.5	-0.9

☐ Model Block Surgery

Soft Tissue Profile: ☒ Profile touch-up ☐ Lip reposturing

Auto lip adjustment: V: A-P:

Undo List Prev Notes Delete Rest

- Original -

1. -Arriett SX MD Only w/ Chiro

mm mm

Upper 1: 0.0 0.0 0.0
Lower 1: 0.0 0.0 0.0
Upper 6: 0.0 0.0 0.0
Lower 6: 0.0 0.0 0.0
A Point: 0.0
B Point: 0.0

Mx (LeFort): 0.0 0.0 0.0
Ant. Mx: 0.0 0.0 0.0
Post. Mx: 0.0 0.0 0.0
Mx+Md: 0.0 0.0 0.0
Md (BSSD): 3.2 0.0 -2.6
Rotate Md @ Hinge Axis: 0.3
Rotate Mx+Md @ Hinge Axis: 0.0
Genioplasty: 3.5 -1.0
Others: Post Md Rotate@Hinge

Autorotate mandible

Arch Length Discrepancy
Mx: 0.0 mm Edit...
Md: 0.0 mm
Extract... Expand... Strip...



**Pre-SX
Records:
7/23/07**

13.75 mos TX

Orthognathic SX for OSA



**TX Finish:
5/22/08**

23.75 mos TX



Orthognathic SX for OSA



ORTHOGNATHIC SX FOR OSA



**Pre-SX
Records:
11/14/06**

6.5 mos TX



ORTHOGNATHIC SX FOR OSA



**TX Start:
4/27/06**



ORTHOGNATHIC SX FOR OSA



**Progress Records:
9/24/08**

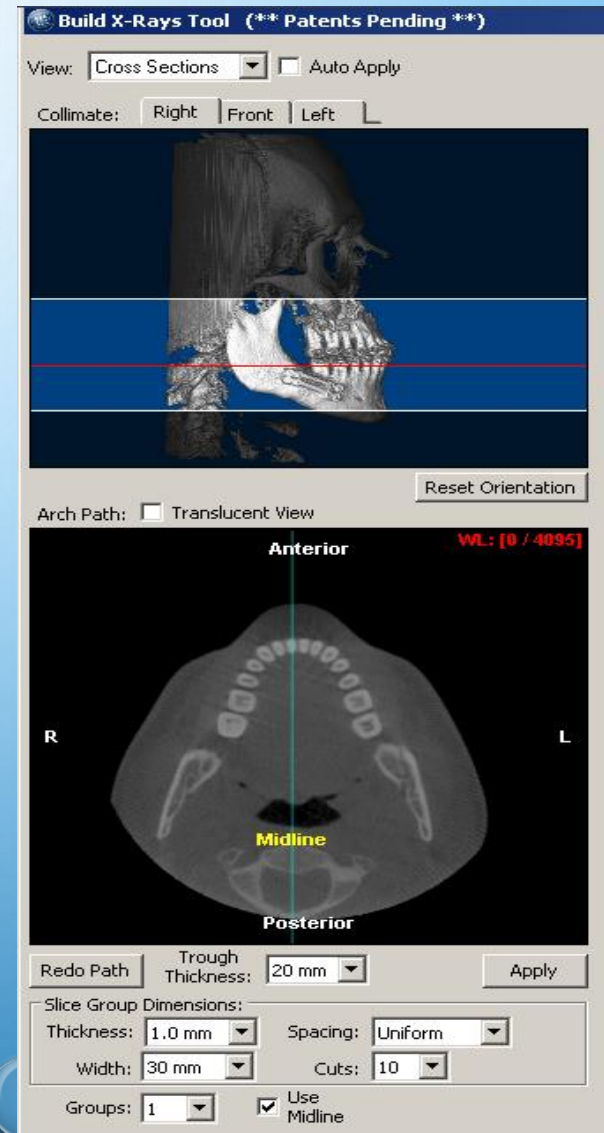
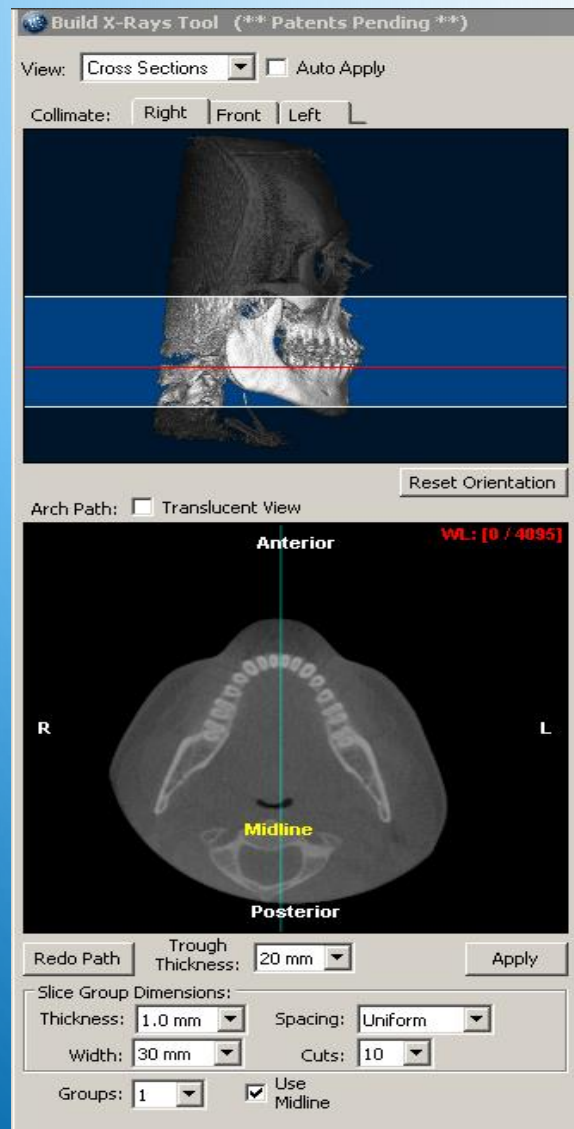
29 mos TX



ORTHOGNATHIC SX FOR OSA



ORTHOGNATHIC SX FOR OSA



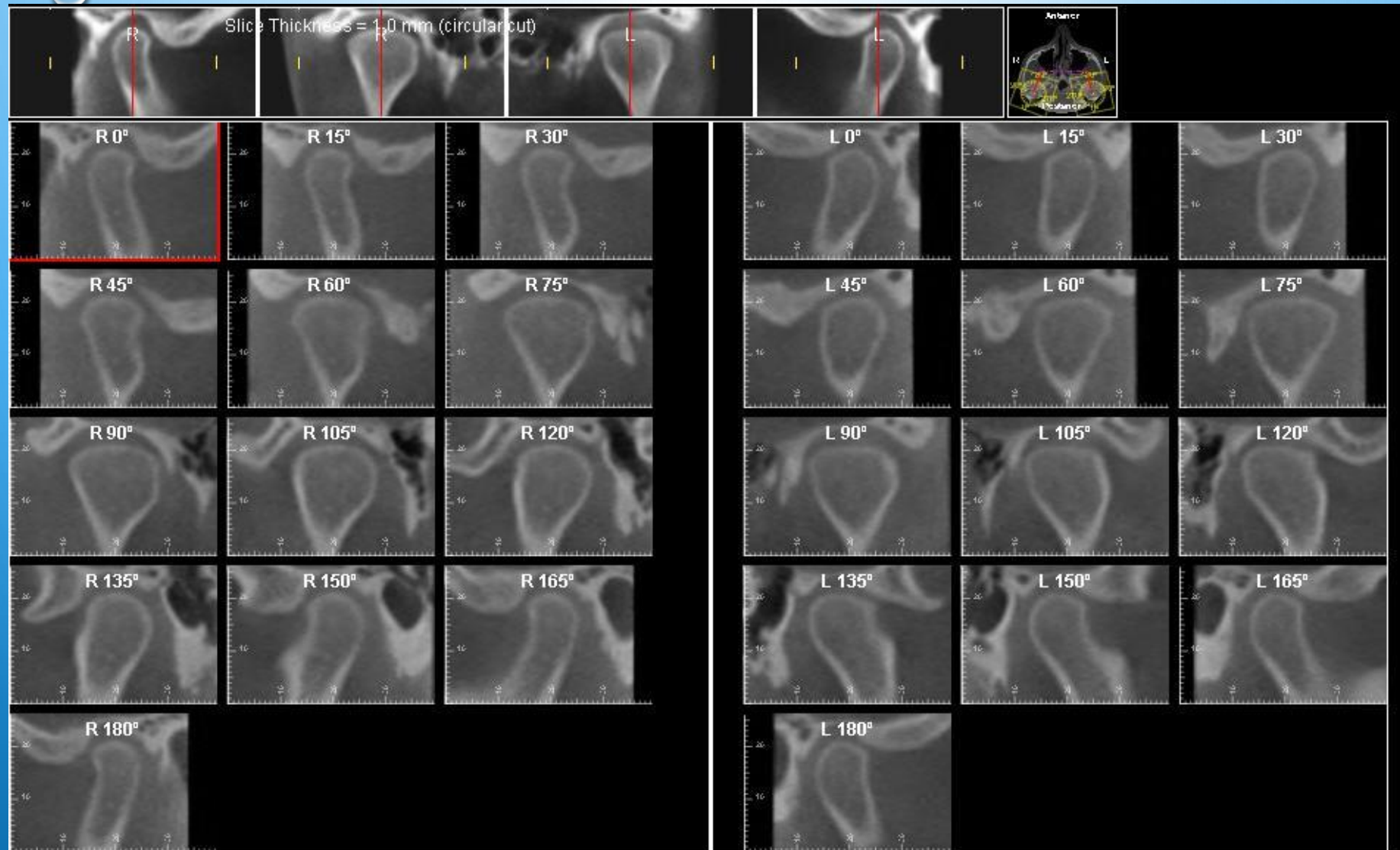
ORTHOGNATHIC SX FOR OSA



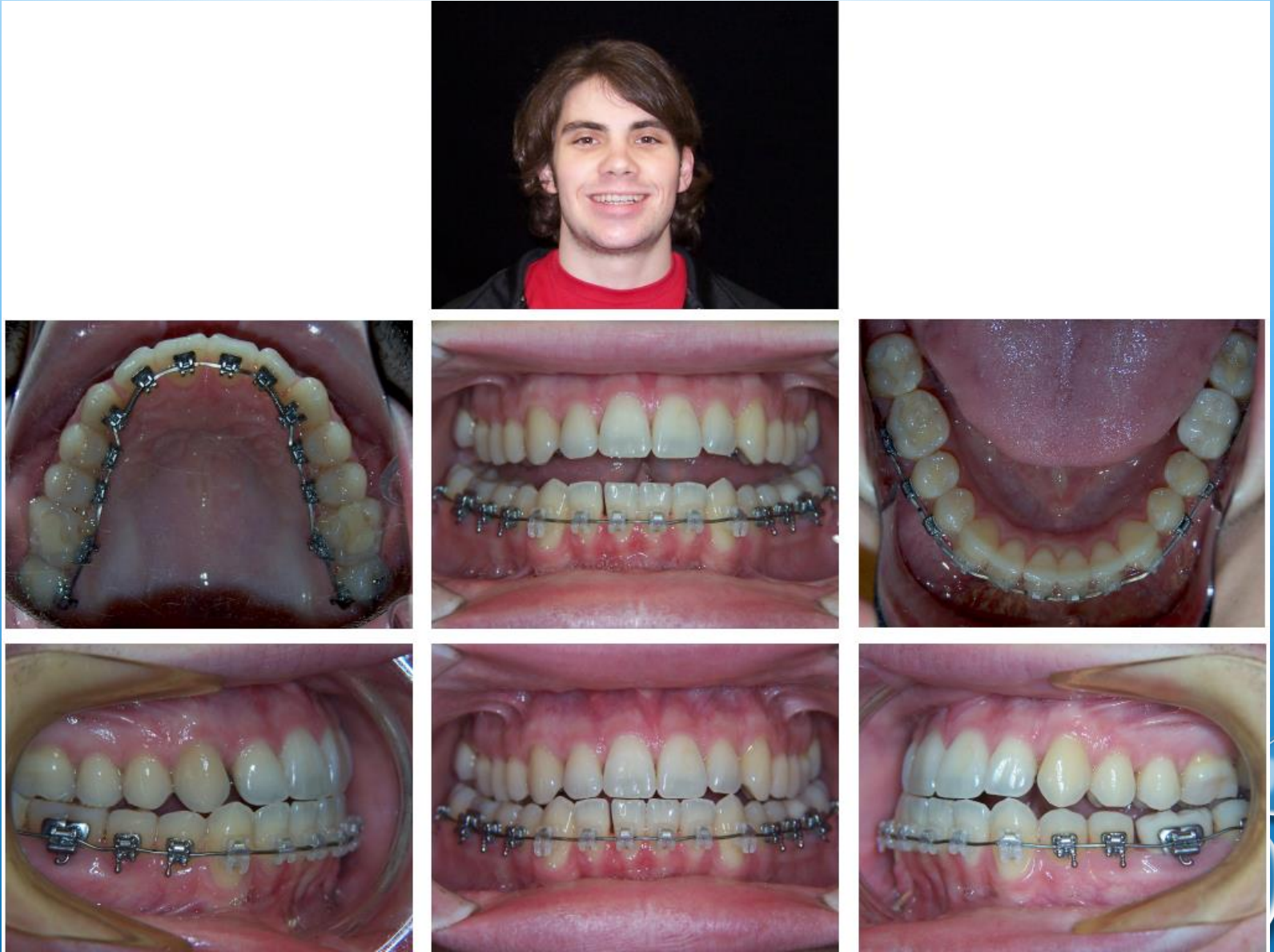
DENTAL EFFECTS OF ORTHOTICS FOR OSA – 8/25/09



DENTAL EFFECTS OF ORTHOTICS FOR OSA – 8/25/09



DENTAL EFFECTS OF ORTHOTICS FOR OSA – 3/24/10



AM – 3/24/10

6 MONTHS, 3 DAYS TX

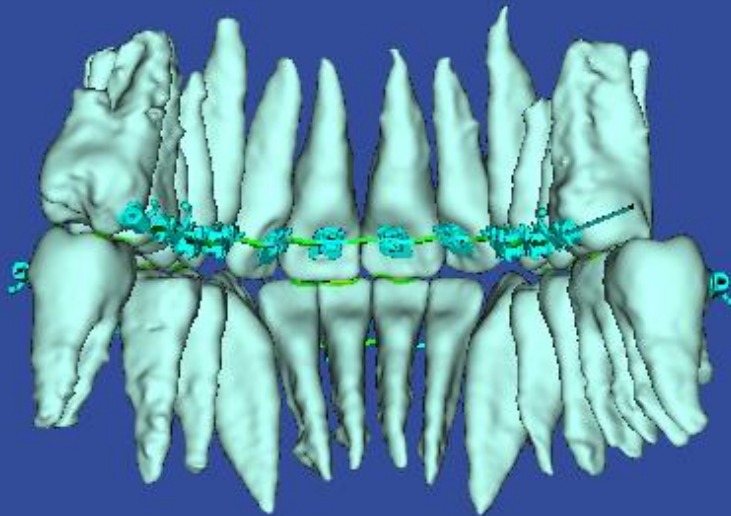
Comparison Model: Therapeutic Model
1 (09/20/09 18:00:00)

Practice Feature Points: Read Only

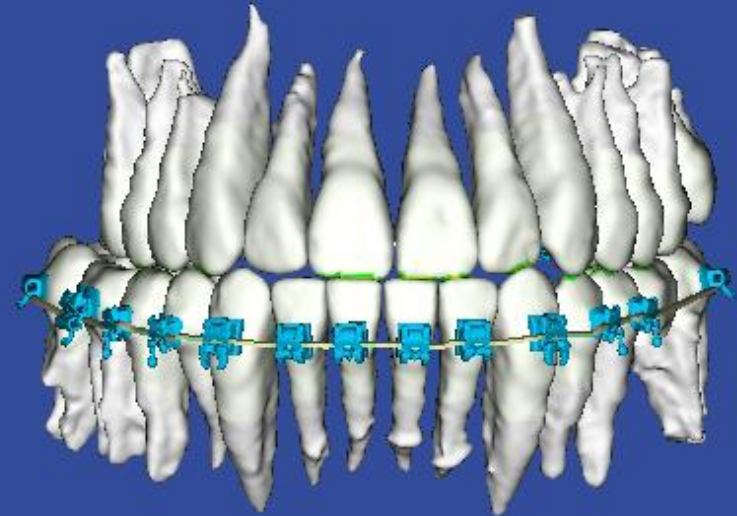
2D Photo/Ceph View

h 1 [0.2 DL]

Product Notes



Camera (Patient View) Navigation



Camera (Patient View) Navigation

Order	Upper Wire	Lower Wire	Upper Disp.	Lower Disp.																
					8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Insert wire beginning at tooth..							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Automatic Slot Filling / Lingual Torque							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Automatic Slot Filling / Facial Torque							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filling Torque Facial (+) Lingual (-)																				
Straight							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buccal (+) Lingual (-) [mm]																				
Occlusal (+) Gingival (-) [mm]																	-0.5	-0.5	-1.5	
Torque Facial (+) Lingual (-) [deg]																			-15	
Angulation Mesial (+) Distal (-) [deg]																				
Rotation Mesial (+) Distal (-) [deg]																				
Limit Value [%]							100	100	100	100	100	100	100	100	100	100	100	100	100	100

Base Model: Plan 1

Wire Material/Cross Section:

CuNiTi / NITI .017x.025

☐ Curve of Spee:
☐ Reverse CoS:

☐ Expansion:
☐ Constriction:

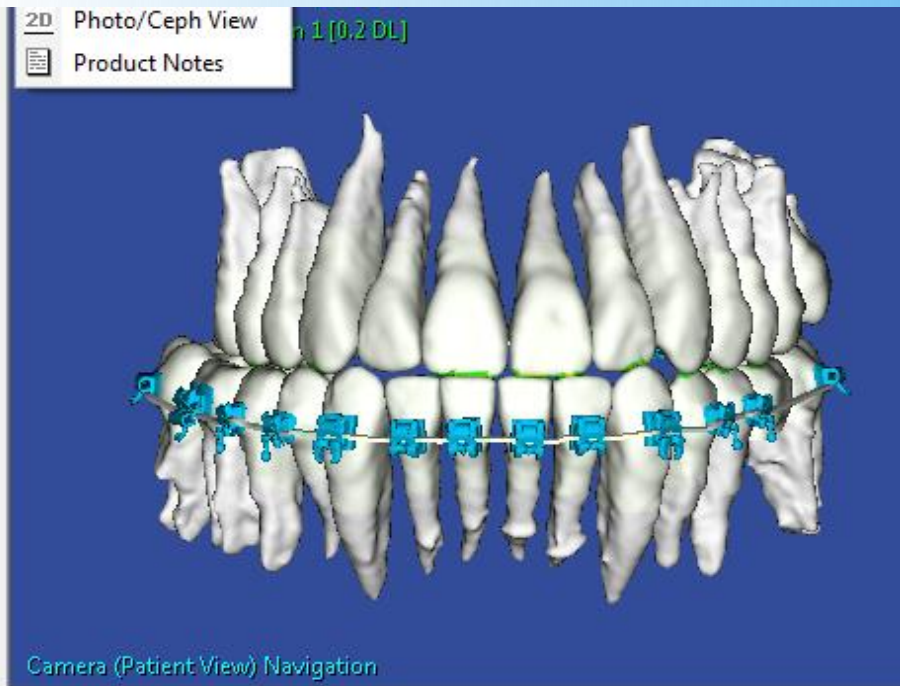
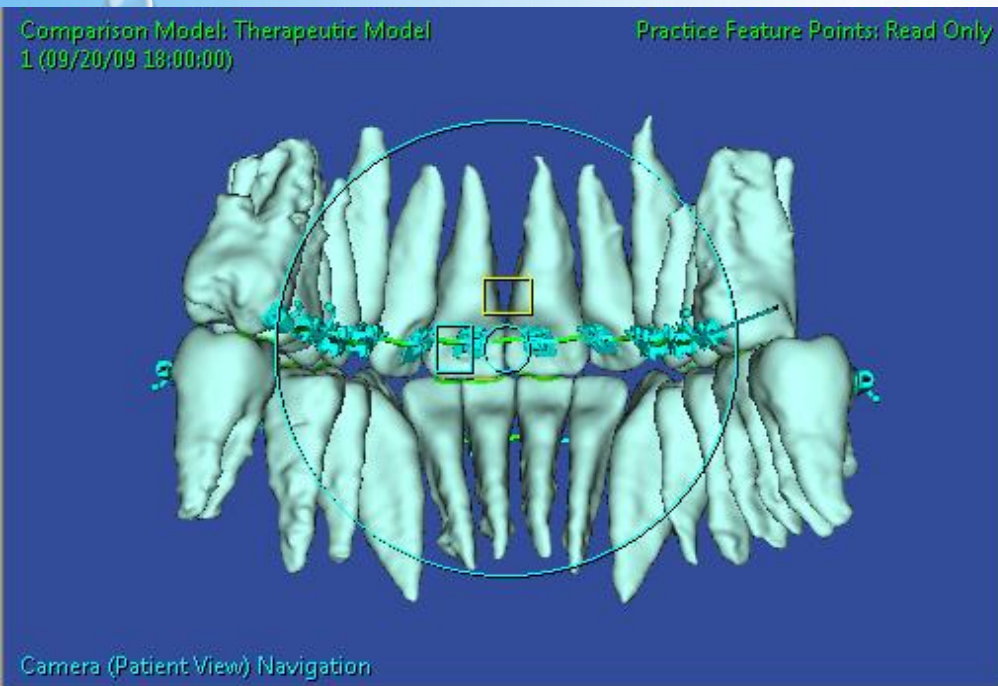
☒ Simulate Tooth Movement

Calc Slot Filling Torques

Apply

AM – 3/24/10

6 MONTHS, 3 DAYS TX



Order	Upper Wire	Lower Wire	Upper Disp.	Lower Disp.	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Insert wire beginning at tooth..																				
Automatic Slot Filling / Lingual Torque																				
Automatic Slot Filling / Facial Torque																				
Filling Torque Facial (+) Lingual (-)																				
Straight																				
Buccal (+) Lingual (-) [mm]																				
Occlusal (+) Gingival (-) [mm]		-1.0	-1.0																-1.0	
Torque Facial (+) Lingual (-) [deg]																				
Angulation Mesial (+) Distal (-) [deg]																				
Rotation Mesial (+) Distal (-) [deg]																				
Limit Value [%]		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Base Model: Plan 1

Wire Material/Cross Section:

CuNiTi / NiTi .017x.025

☐ Curve of Spee:
☐ Reverse CoS:

☐ Expansion:
☐ Constriction:

☐ Simulate Tooth Movement

Calc Slot Filling Torques

Apply

AM – 5/26/10 SX RECORDS 8 MONTHS, 5 DAYS TX
SX DATE – 6/30/10



Treatment Simulation (VTO)

CO-CR Growth TxPlan Goals

Maxilla	A-P	Vert
ANS	+3.9	+0.8
PNS	+4.0	+2.2
Mx1 tip	+4.7	+0.7
Molar MB cusp tip	+4.6	+1.5

Mandible	A-P	Vert
Md1 tip	+1.8	-2.5
Molar MB cusp tip	+2.1	-1.0
B point	+2.9	-2.0
Pog	+3.9	-2.1
Genioplasty	0.0	0.0

☐ Model Block Surgery

Soft Tissue Profile

- ☒ Profile touch-up
☐ Lip reposturing

Auto lip adjustment:

V: < >

A-P: < >

Superimpose...

Procedures...

Undo List

Prev Notes

Delete Rest

- Original -

- 1: Head posture re-alignment
- 2: Step 3) Auto-rotate Md: +2.0 Deg
- 3: Step 4) BSSD: (H: -4.3 mm V: 0.0 mm)
- 4: Step 4) BSSD Rotate: +0.1 Deg
- 5: Step 5) Mx+Md Ost: (H: +2.7 mm V: +0.7 mm)
- 6: Step 5) Mx+Md Ost: H: +2.0 mm
- 7: Step 6) Mx+Md Rotate: +1.8 Deg
- 8: Soft-tissue profile adj



mm

mm

°

Upper 1: 0.0 0.0 0.0
 Lower 1: 0.0 0.0 0.0
 Upper 6: 0.0 0.0 0.0
 Lower 6: 0.0 0.0 0.0
 A Point: 0.0 0.0
 B Point: 0.0 0.0

Mx (LeFort): 0.0 0.0 0.0
 Ant. Mx: 0.0 0.0 0.0
 Post. Mx: 0.0 0.0 0.0
 Mx+Md: 4.7 0.7 1.8
 Md (BSSD): -4.3 -0.0 0.1
 Rotate Md @ Hinge Axis: 2.0
 Rotate Mx+Md @ Hinge Axis: 0.0
 Genioplasty: 0.0 0.0

Others: (S) Post Md Rotate@Hinge

Autorotate mandible

Arch Length Discrepancy

Mx: 0.0 mm

Md: 0.0 mm

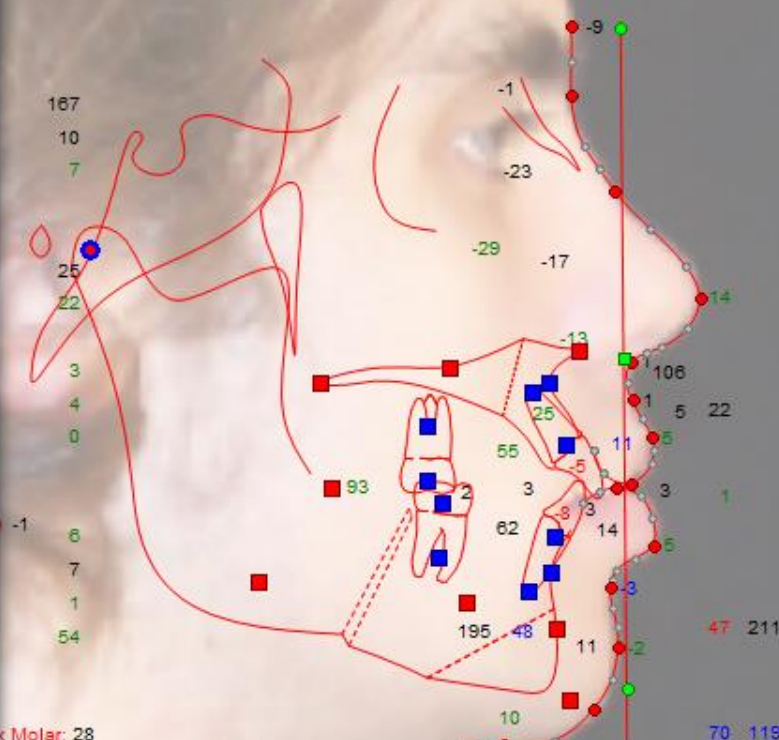
Extract...

Expand...

Edit...

Strip...

- ☒ 3D 3D View
☐ 2D Photo/Ceph View
☐ Product Notes



Molar: 28
 Md1 to Md Molar: 22
 Md1 to Pog: 30

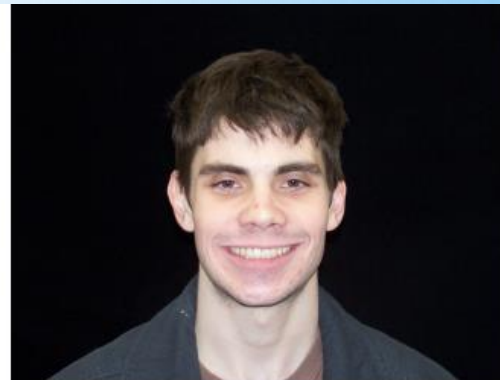
AM - 7/28/10 2 WEEK POST-SX CHECK



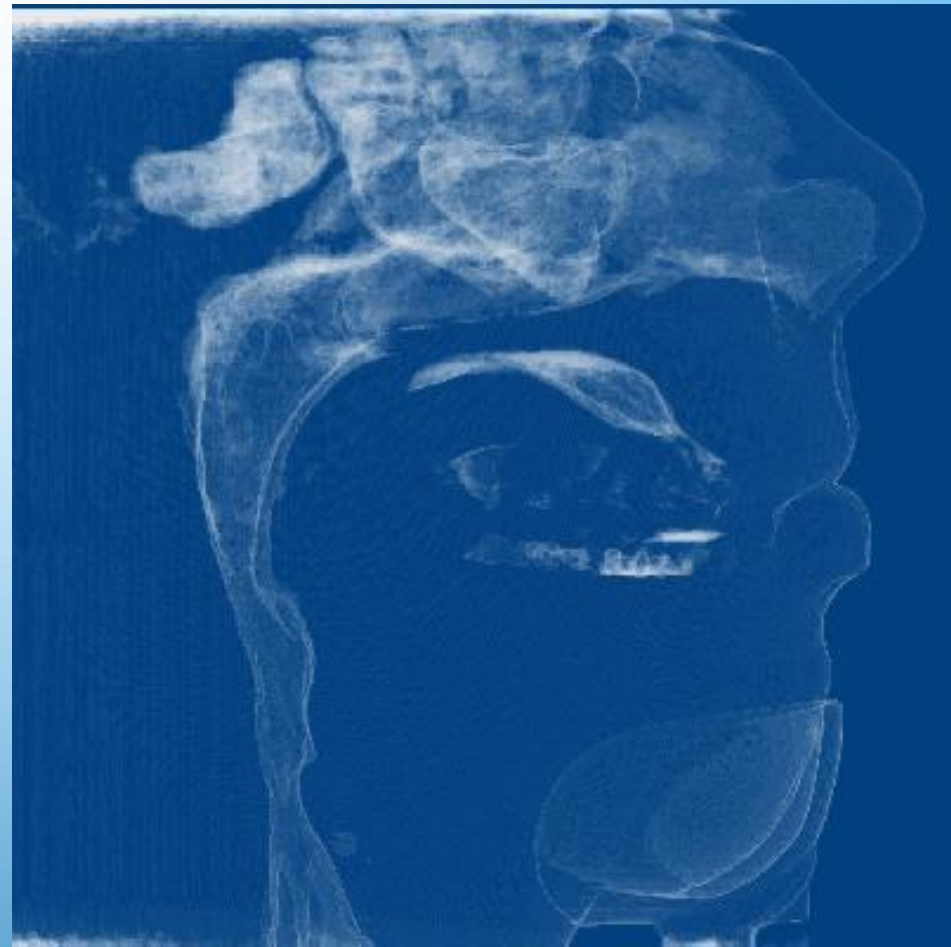
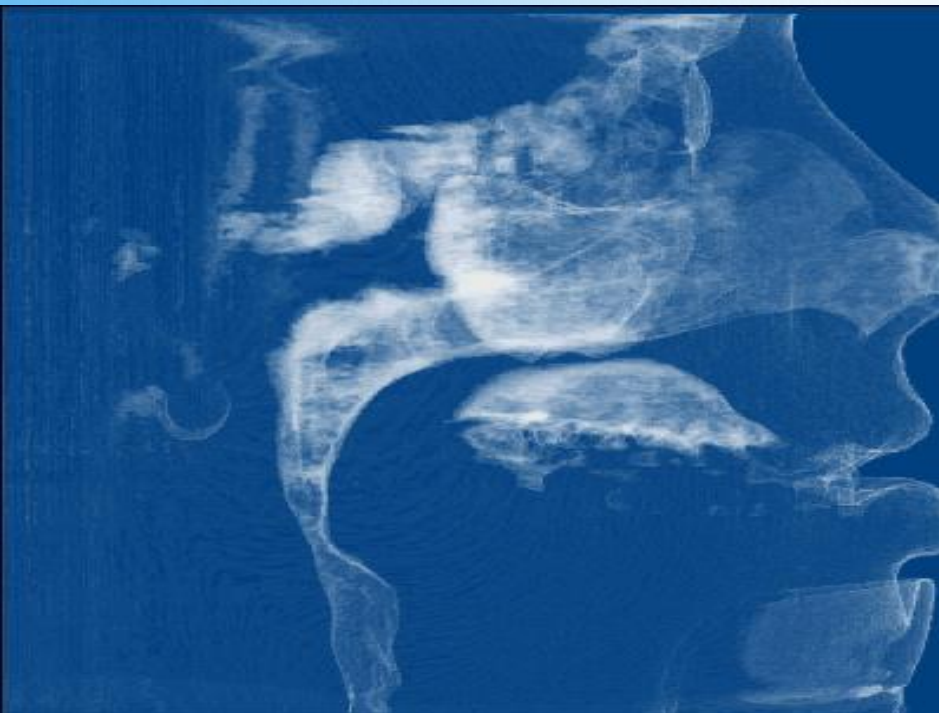
AM - 9/15/10 UPDATED SS SCAN - 11.75 MOS TX



AM – 1/27/11 DEBOND
16.25 MONTHS TX



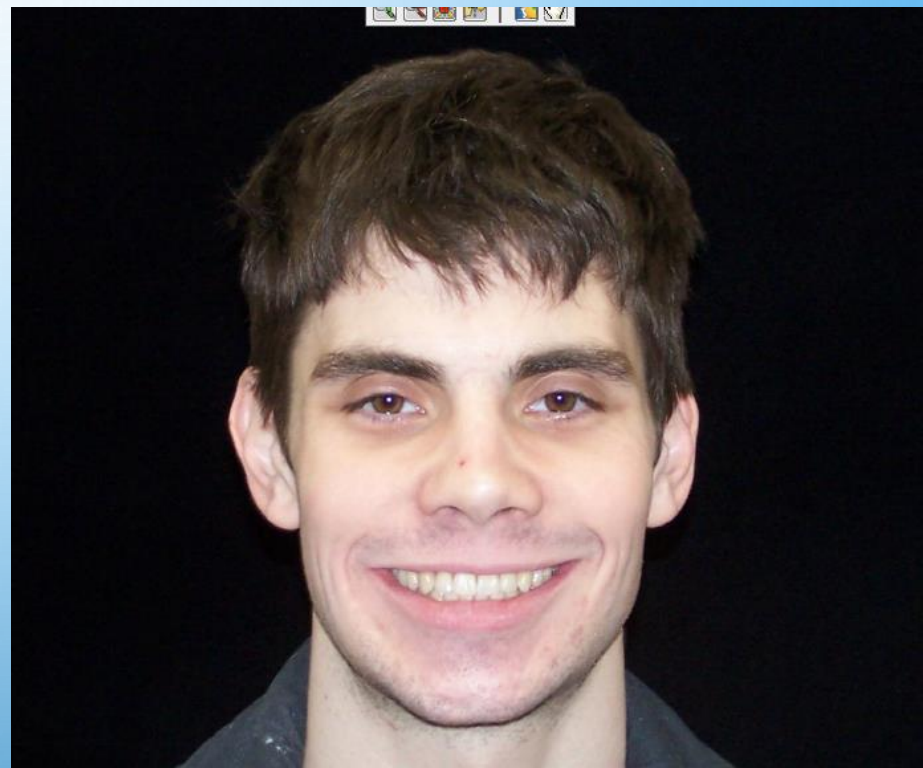
**AM – 1/27/11 DEBOND
16.25 MONTHS TX**



AM – 1/27/11 DEBOND
16.25 MONTHS TX



AM – 1/27/11 DEBOND
16.25 MONTHS TX



AM PERSONAL TESTIMONIAL



Dental Effects of Orthotics for OSA

1/25/12 – Age 62 yrs, 7 mos



Dental Effects of Orthotics for OSA

1/25/12 – Age 62 yrs, 7 mos



Dental Effects of Orthotics for OSA – 8/21/12



Dental Effects of Orthotics for OSA

Debond – 5/1/13



Dental Effects of Orthotics for OSA

TR – Testimonial 9/9/16



Deacon Tim Reilly <deacontimreilly@outlook.com>

Ed Lin

RE: Tim Reilly sleep disorder story

Sent from my iPhone

On Sep 9, 2016, at 4:49 PM, Deacon Tim Reilly <deacontimreilly@outlook.com> wrote:

Dear Ed,

Peace in God's love and greetings! It was really good to hear from you today. Now that we are mostly settled into our new home in Madison, it is always great to get a call from Green Bay and connect with our friends.

Here is my story. I am probably giving you more than you want or need, but you can select as little or as much as you want.

In retrospect, I do not know when my sleep issues started. Early in our marriage (our early 20's), my wife would tell me of her dreams. She always pressed me to tell her about my dreams to which I would always reply that I did not dream. She said that everyone dreams, but I assured her that I did not. When one is young with endless energy, not getting the sleep one needs does not seem to be such a big deal. However, I now remember that I had always yawned a lot and one of my bosses at Fort Howard suggested that I get more sleep. I assured him I was getting enough sleep. People did not know about or talk about sleep apnea in the 1980's.

The first acute symptom which I had (but was not tied to sleep issues at the time) was being diagnosed with irregular heartbeat at age 48. I underwent cardioversion several times and was put on a medicine which was supposed to keep me in rhythm. A stated side effect of the medicine was sleeplessness. The commencement of the medicine coincided with tiredness and fatigue. I attributed the sleeplessness and fatigue to the medicine so I pursued and underwent two ablations, one for atrial fibrillation (age 50) and one for atrial flutter (age 52), so that I could quit the medicine. The ablations were successful and I was finally able quit the medicine. Unfortunately, the discontinuation of the medicine did not help my sleep.

I was now 52 and was advised to get a sleep study, which showed significant awakenings all night long even though I thought that I was asleep. I also discovered that sleep apnea causes irregular heartbeat. For four years, I was on blood thinner and medications for the heart issue, which very well may have been caused by the sleep apnea!

It was then at age 52 that I started to wear a dental device at night which pulled my lower jaw forward to open the airway. Initially this was very helpful, but in retrospect was only of marginal help. I did not fully perceive the degree of sleep deprivation I was experiencing. As time went on, I needed to crank my jaw further forward to achieve the same outcome. This created bite issues, periodontal issues, and jaw soreness.

Dental Effects of Orthotics for OSA

TR – Testimonial 9/9/16

While all of this was going on, I also suffered from chronic sinus infections. I had already had sinus surgery at age 44 to open up my sinus cavities, but continued to be plagued by infections and an inability to breathe through my nose at night. I saw a Bellin ENT who specialized in sleep issues. I forgot his name but he is now deceased. This led to a second sinus surgery at age 59 to further open my cavities and try to improve the air flow at night.

For some reason I was not a good candidate for a C-pap machine. I wasn't really interested in being tied to such a machine and wanted to pursue other avenues. I did try a C-pap for a week or so and did not have good results.

From age 53 until my mandibular surgery, I lived a life of chronic fatigue. I have always been an energetic person and my adrenaline would kick in to get me through my work life. I tried to use caffeine sparingly, knowing that I wanted to save its effect for critical times. I could fall asleep anytime. My wife drove the car if we were together and I would fall asleep within minutes. Sometimes, I was so fatigued that my brain would just not allow me to attend to my work at Notre Dame Academy or subsequently at the Diocesan Chancery. I would keep a kitchen timer in my office so that I could take a 45 minute nap in my office or in my car in order to get through the day. When I would get home after work, I had no energy and I would simply do things to avoid falling asleep until 8:30 or 9:00 PM. I would then spend eight to ten hours in bed and wake up tired. Every weekend I would nap on Saturday and on Sunday. I have historically been an optimistic person, but during that time I was certainly suffering from depression. I would never consider suicide as a viable option (philosophically and morally), but the thought of not being alive was often more appealing than being alive. Every day was such a challenge. However, I knew that even in my reduced state, I had the ability to keep working and helping my family so I trudged on.

Fortunately, my dental hygienist kept urging me to go see Dr. Ed Lin. I should have done it sooner than later. The period of braces to prepare my mouth for surgery was very challenging because I could no longer wear my dental device. I tried to stay off of my back when I slept so I wore a back pack to bed with a football in it to keep me on my side. The surgery at age 62 was obviously pretty significant in terms of pain and recovery. However, on the very first night at home after the surgery, I started to dream again. It was fantastic! After a period of time, I also surprised to "start" having nocturnal erections. I had thought that they were part of being a teenager and younger man. Just like I was not dreaming for so many years, I was also not having nocturnal erections. I never really thought about it until they started again after the surgery. However, not having them for all of those years would have been another good indicator that I was having sleep issues.

After the surgery, I continued to have sinus issues which mitigated some of the good work from the jaw surgery. Working with Dr. Clemens of Prevea, I had two turbinate reductions. He is very conservative. The first reduction helped but did not get me totally to where I thought I could be. On nights when I would take Afrin, I would sleep much better. This was a sign that my turbinate tubes were filling with blood while I slept and obstructing the air flow through my nose. So then he did the second turbinate reduction with the result of clear breathing all night and fewer sinus infections.

Dental Effects of Orthotics for OSA

TR – Testimonial 9/9/16

What has this surgery meant to me? I received a new lease on life! I was able to energetically complete my working career with a normal work/pleasure balance experienced by most people. I now normally sleep seven hours without awakening and then decide whether to sleep another hour. I seldom take naps. I have all the energy to do the things that someone at age 66 would want to do. I lost 20 pounds during the braces/surgery process and have only put ten of the pounds back on. I am not dieting. I believe that less time in bed and more active time is keeping my weight down (170 pounds at 5'11"). The periodontal issues have also gone away now that my sleep is better and that my teeth are not being stressed by the sleep dental device I used to wear.

Ed, I have no regrets about my life and how things have unfolded for me. However, I can't help but wonder how I may have made decisions differently if I had been properly diagnosed and had had this surgery when I was still in my 40's. I realize now that my conclusions that my reduced energy was the result of "getting old" were really signals that my sleep life was not supporting my lifestyle.

My grandfather frequently quipped, "I was sleeping and dreamt that I was awake. Then I woke up and found out I was sleeping." His words sum up the challenges of someone with sleep issues. There is not much difference between being awake or asleep. Thank you for getting my sleep to be sleep and my awake to be really awake!

Blessings and peace,

Tim Reilly

P.S. Please send me a return e-mail so that I know that you received this.

TX Options for OSA

Issue	Dental Orthotic	CPAP	Surgical
Comfort	Good	Poor	Painful
Invasiveness	Non-invasive	Non-invasive	Invasive
Compliance (Tolerance)	Good	Poor	N/A
Portability	Excellent	Poor	N/A
* Possible Side Effects	Minimal	Moderate	Numerous
** Cost	Varies	Varies	Varies


* Possible side effects of dental orthotics are infrequent TMJ (usually reversible) and possible tooth movement.

** The cost of dental orthotic appliances is usually similar to CPAP and likely less than surgery. All three OSA treatment options can possibly be eligible for medical insurance coverage depending on your particular policy.

“Your work is going to fill a large part of your life and the only way to be truly satisfied is to do great work. And the only way to do great work is to love what you do. If you haven’t found it yet, keep looking. Don’t settle. As with all matters of the heart, you’ll know when you find it.”

Steve Jobs (1955 – 2011)



The image features a black central area with the text "What can you do?" in white. The top and bottom edges are decorated with a blue gradient background and several realistic water droplets of varying sizes.

What can you do?