

CASE REPORT

A VIDEO OF THIS CASE CAN BE FOUND ON OUR WEBSITE:
[HTTP://WWW.PCSORTHO.ORG](http://www.pcsortho.org)

PRE-TREATMENT

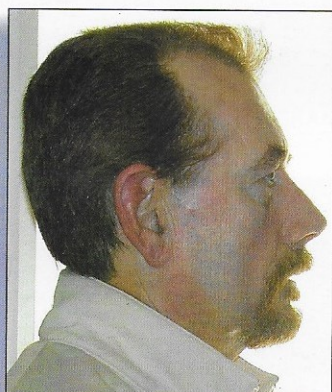
How would you treat this malocclusion?

Patient J.H. 61 years

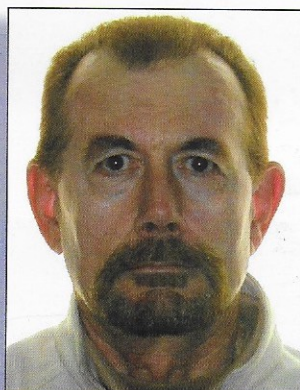
This 61-year-old male presents with two chief complaints: "I am having trouble chewing" and "my bite seems to be getting worse." The patient is also motivated by a daughter who works in the dental field and has concerns that he could experience tooth loss if his malocclusion is not addressed. His medical history is non-contributory. He has a history of routine dental visits, but only recently started seeing a new dentist, who recommended an orthodontic consultation. A clinical TMJ evaluation displays normal range of movement without any pain, popping, or clicking. The patient is very motivated to improve his occlusion.

EXTRAORAL FINDINGS

On the frontal facial photograph, the patient appears symmetric, with thin lips and 0 to 2 mm interlabial gap at rest. When smiling, the patient displays 90% of his maxillary incisors and has lingually inclined maxillary premolars, creating prominent buccal corridors. His smile is symmetric, and wear is evident on the maxillary incisors and canines. He has a convex profile and a strong chin button.



PROFILE



FRONTAL



SMILING

INTRAORAL FINDINGS

The patient presents in the permanent dentition with significant maxillary and mandibular incisal wear. His maxillary midline is coincident with his facial midline, and the mandibular midline is deviated 3 mm to the left of the maxillary midline. His maxillary arch is relatively U-shaped. There is 2 to 3 mm of maxillary arch length discrepancy. His mandibular arch is significantly omega-shaped, with lingually displaced mandibular premolars. There is 13 mm of mandibular arch length discrepancy and an exaggerated curve of

Spee. He presents with complete buccal crossbites of the mandibular premolars and an impinging deep bite. He has Class I molars on both sides, with severely worn mandibular incisors and moderately worn mandibular canines. His mandibular premolars have erupted lingually and he has 2 to 3 mm of exposed root surfaces. Due to the position of the mandibular premolars, his maxillary first premolars have supererupted 2 to 3 mm, and his second premolars have supererupted 1 to 2 mm. His maxillary and mandibular molars display very little wear.

CASE REPORT

RADIOGRAPHIC FINDINGS

Cephalometric evaluation reveals a Class II skeletal pattern (ANB: 4.1°), with retroclined maxillary and mandibular incisors (U1-SN: 92.2° and IMPA: 83.5°) and a low mandibular plane angle (FMA: 20.7°).

The panoramic radiograph reveals general symmetry of the right and left condyles and mandible. He has an impacted maxillary right third molar and erupted maxillary left third molar. His mandibular third molars are not present.

INITIAL PHOTOS



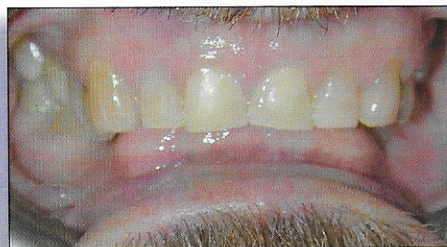
RIGHT LATERAL



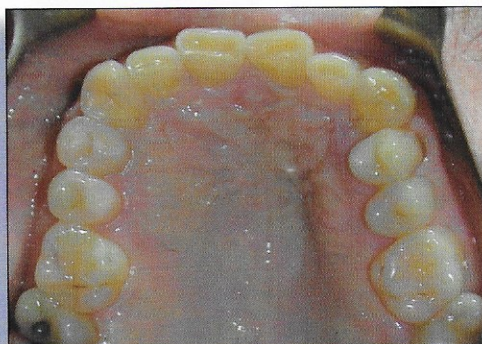
FRONTAL OPEN



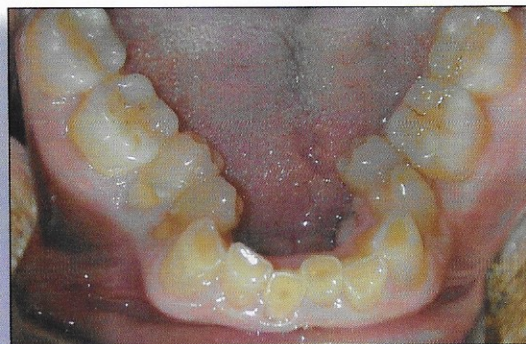
LEFT LATERAL



FRONTAL CLOSED



MAXILLARY OCCLUSAL



MANDIBULAR OCCLUSAL

CASE REPORT

TREATMENT OPTIONS

Option 1. Comprehensive orthodontic treatment with full fixed appliances, a mandibular bi-helix expander, a maxillary biteplate appliance, and an evaluation of whether the premolars should be extracted.

Option 2. Comprehensive non-extraction orthodontic treatment with full fixed appliances and posterior crossbite elastics.

Option 3. Comprehensive non-extraction orthodontic treatment with full fixed appliances and the use of accelerated osteogenic orthodontics to facilitate tooth movements.

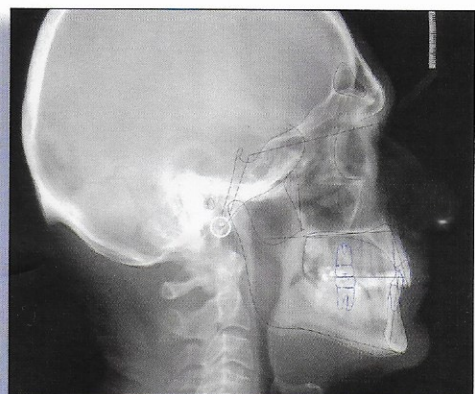
Option 4. Comprehensive orthodontic treatment with extraction of all mandibular premolars, to be replaced with dental implants. The implants will be used to help level the mandibular arch with full fixed appliances, and after treatment, restorations will be placed on the implants.



INITIAL LATERAL CEPHALOGRAM



INITIAL PANORAMIC RADIOGRAPH



DIGITIZED INITIAL LATERAL CEPHALOGRAM

LATERAL CEPHALOMETRIC MEASUREMENTS

VARIABLE	NORM	PRE-TREATMENT
SNA (°)	82.0	86.9
SNB (°)	80.0	82.8
ANB (°)	1.6	4.1
FMA (FH-MP) (°)	23.9	20.7
SN-MP (°)	32.9	25.5
U1 - NA (mm)	4.3	0.9
U1 - SN (°)	102.8	92.2
L1 - NB (mm)	4.0	1.8
IMPA (L1-MP) (°)	95.0	83.5
Upper Lip (mm)	-4.0	-7.2
Lower Lip (mm)	-2.0	-6.7

For Post-Treatment of Case J.H., see page 46.

POST-TREATMENT

How would you treat this malocclusion?

Case J.H. 64 years

TREATMENT PLAN

Treatment option #2 (non-extraction, full fixed appliances) was chosen. To facilitate leveling of the mandibular arch, a plan was put in place to bond the mandibular anterior teeth to ideal size prior to bracket placement. In addition, fixed appliances on the mandibular teeth were to be placed first, and a maxillary biteplate retainer was to be worn full-time. The intention was to improve arch coordination in the posterior before bonding the upper arch, and to aid in leveling the mandibular arch. The patient was informed that the mandibular premolars could be compromised during treatment due to the severe recession.

The patient was referred to his dentist for temporary composite restorations on his mandibular incisors and canines, with the goal of restoring them to their original length. Immediately after completion of the temporary restorations, fixed .022" Damon appliances (Ormco, Orange, CA) were placed from mandibular second molar to second molar, with the exception of the mandibular left second premolar. A .014" CuNiTi wire was placed from first molar to first molar and an active open coil spring was utilized to open space for the blocked-out mandibular left second premolar.

PROGRESS PHOTOS



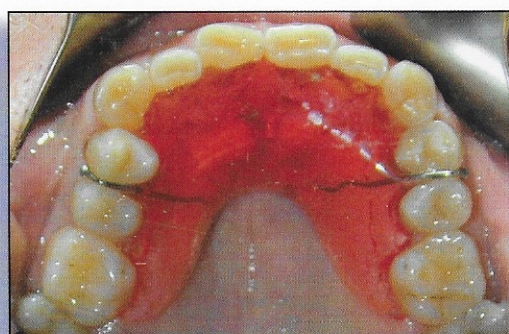
RIGHT LATERAL



FRONTAL



LEFT LATERAL



MAXILLARY OCCLUSAL



MANDIBULAR OCCLUSAL

CASE REPORT

A maxillary biteplate appliance was delivered, and the patient was instructed to wear the appliance full-time, including during meals. When the patient was seen one month later to determine how he was tolerating the biteplate retainer, the patient stated that he was "doing fine." Two months after his initial visit, a mandibular .016" CuNiTi wire was placed from second molar to second molar and the open coil spring was re-activated a bracket's width. Two months later, a .018" CuNiTi was placed. The patient said he was only wearing the maxillary biteplate appliance sporadically and preferred not to wear it. He felt he just needed to "be careful" with his chewing to avoid biting on the lower braces. He was instructed to wear the biteplate appliance as needed at this point.

After nine months in treatment, the mandibular arch was developing nicely, but the supererupted maxillary premolars seemed to be inhibiting further broadening of the mandibular arch during chewing, so brackets were placed on the maxillary arch from second molar to second molar. In addition, the mandibular left second premolar was bonded. A maxillary .014" CuNiTi wire was placed from first molar to first molar and the same mandibular wire was continued. Two months later, a .018" CuNiTi wire was placed in the maxillary arch to the second molars. A panoramic radiograph was taken two months later. The mandibular premolars and the maxillary right first premolar were repositioned and a maxillary .014" x .025" CuNiTi wire was placed. A new maxillary .016" x .025" CuNiTi and mandibular .014" x

FINAL PHOTOS



PROFILE



FRONTAL



SMILING



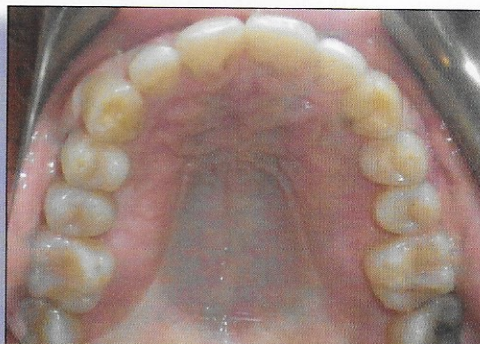
RIGHT LATERAL



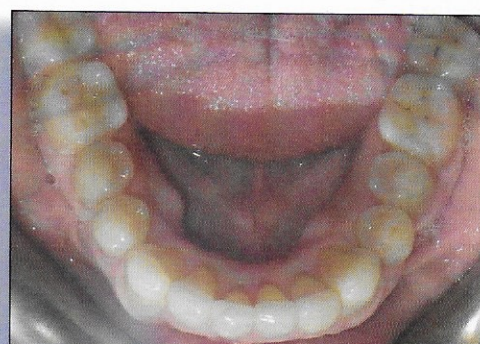
FRONTAL



LEFT LATERAL



MAXILLARY OCCLUSAL

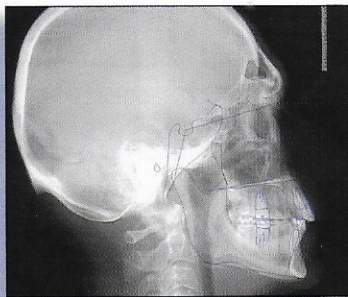


MANDIBULAR OCCLUSAL

CASE REPORT



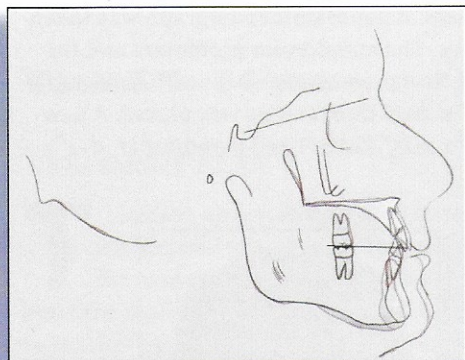
FINAL LATERAL CEPHALOGRAM



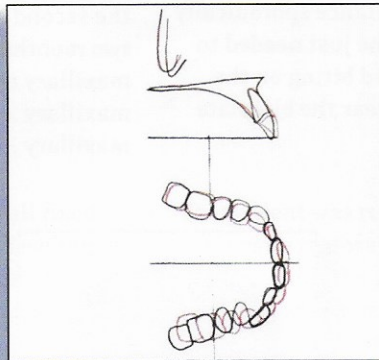
DIGITIZED FINAL LATERAL CEPHALOGRAM



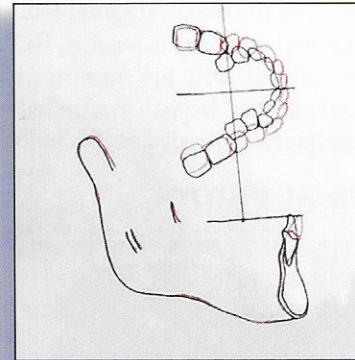
FINAL PANORAMIC RADIOGRAPH



GENERAL SUPERIMPOSITION



MAXILLARY SUPERIMPOSITION



MANDIBULAR SUPERIMPOSITION

.025" CuNiTi were placed two months later, followed by the placement of a maxillary .018" x .025" CuNiTi and a mandibular .016" x .025" CuNiTi. A final .019" x .025" SS maxillary wire was placed nearly two years after the start of treatment, and lingual buttons were placed on the mandibular second premolars and first molars to begin posterior cross elastics for posterior arch coordination and separation of the posterior occlusion. The mandibular right premolars were repositioned again six weeks later to help intrude the teeth, and the elastics were continued. Five weeks later, a mandibular .018" x .025" CuNiTi wire was placed, and elastics were continued. Two months later, a final mandibular .016" x .025" SS wire was placed; the posterior cross elastics were discontinued because the posterior arch coordination had improved. Slightly active open coil springs were placed between the mandibular incisors to create space for future restorations, since the mandibular incisors were significantly narrow due to the heavy wear on these teeth.

The patient was seen every six weeks for detailing and arch coordination, while wearing Class II elastics for the next six months. After 36 months in treatment, maxillary and mandibular Hawley retainers were delivered. Shortly after removal of the braces, full-coverage crowns were placed on the mandibular incisors and conservative composite restorations were placed on the maxillary central incisors and the

mandibular canines. A new lower Hawley retainer was made after restorations. Full-time retainer wear was prescribed for six months, to be followed by nighttime wear. Equilibration of the posterior occlusion was completed during retention.

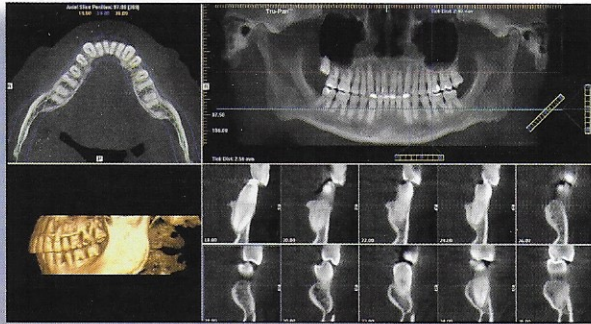
RESULTS ACHIEVED

The total treatment time was 36 months (the original plan was estimated at 30 months). Treatment was comprised of 24 office visits, plus five emergency appointments for broken brackets. Dental esthetics were greatly improved despite the fact that the patient decided against full restorations on the maxillary incisors and canines and instead opted for minimal bonding of the maxillary central incisal edges. The patient had full-coverage crowns placed on the mandibular incisors and composite restorations of the incisal edges of the mandibular canines. The mandibular arch was broadened nearly 15 mm in the premolar region. A functional Class II occlusion was obtained, with posterior contact restored.

Based on cephalometric measurements, the skeletal Class II pattern increased slightly (ANB: 5.2°), the maxillary and mandibular incisors were proclined (U1-SN: 98.5° and IMPA: 98.4°) compared with pre-treatment, and the mandibular plane angle increased slightly (FMA: 22.1°).

CASE REPORT

A cone-beam computed tomography (CBCT) image was taken two years after debonding in order to evaluate the bony support in the mandibular premolar areas. Although cross sections in this area demonstrated dehiscences on the cervical regions, bone existed below these regions on the buccal side of the mandibular premolars despite the extent of the expansion in this adult patient. No added recession was noted in the maxillary or mandibular premolar segments after treatment.



TWO-YEAR POST-TREATMENT CBCT IMAGES

EDITOR'S COMMENTS

This case is a great example of the advantages and benefits of multidisciplinary care. Having the dentist restore the mandibular incisors before orthodontic treatment allowed the treating clinicians to place brackets in the ideal positions, which provided easier mechanics when leveling and expanding the mandibular arch. This case also shows remarkable movement of the mandibular teeth in an adult

patient. The treating clinicians noted dehiscences near the mandibular premolar cervical regions in the two-year post-treatment CBCT imaging. It would be interesting to know if there were bone present in these locations before the orthodontic treatment, but unfortunately no pre-treatment CBCT images were created. If one considers the extent of the recession prior to orthodontic treatment, he/she may surmise that the bone levels and areas of dehiscence are quite similar (pre-treatment and two-year post-treatment). Regardless of the amount of bone present in these areas, the teeth are now in a functional position and the patient's overall occlusion has been significantly improved.

Dr. Jason Cohen received his undergraduate degree from Tufts University in Medford, MA, in 1996 with a Bachelor of Science in Mechanical Engineering. In 2001, he earned his Doctor of Dental Surgery from UCLA. Dr. Cohen received his Orthodontic specialty training from UCSF in 2004 and is currently in private practice in San Jose, CA.

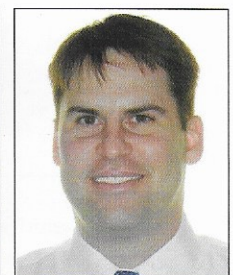
Dr. Eric Phelps received his undergraduate degree from California Polytechnic State University in San Luis Obispo in 1997 with a Bachelor of Science Degree in Engineering. In 2001, he earned his Doctor of Dental Surgery and Master of Science Degree in Oral Biology from UCLA. He completed his Orthodontic training at UCLA in 2003 and is currently in private practice in San Jose, CA.

LATERAL CEPHALOMETRIC MEASUREMENTS

VARIABLE	NORM	PRE-TREATMENT	POST-TREATMENT
SNA (°)	82.0	86.9	87.5
SNB (°)	80.0	82.8	82.3
ANB (°)	1.6	4.1	5.2
FMA (FH-MP) (°)	23.9	20.7	22.1
SN-MP (°)	32.9	25.5	24.3
U1 - NA (mm)	4.3	0.9	1.9
U1 - SN (°)	102.8	92.2	98.5
L1 - NB (mm)	4.0	1.8	5.2
IMPA (L1-MP) (°)	95.0	83.5	98.4
Upper Lip (mm)	-4.0	-7.2	-5.4
Lower Lip (mm)	-2.0	-6.7	-6.3



Dr. Jason Cohen



Dr. Eric Phelps

PCSO Bulletin Case Report Editor:
Andrew Harner, DDS, MS
(Huntington Beach, CA)

For Pre-Treatment of Case J.H., see page 27.