

# The Difference a Millimeter Can Make

## *Correcting a Pathologic Joint Position using Mandibular Torque and a Fixed Orthosis*



Dr. Michael Adler

**N**euromuscular dentists are often criticized as dentists who just open the bite but what happens when we open the bite and maybe things don't go exactly as planned? The patient may still be suffering from symptoms, restorative treatment gets delayed and the patient begins losing confidence in the dentist. What happens when the patient is your father!

My father, and long-time patient, had a severe traumatic painful episode in his left TMJ while eating an Italian ham sandwich on a French baguette. I have to be specific because my father takes his food very seriously. I say this because even after he experienced a crunching gravely pain in his left joint,

he was able to finish the sandwich.

My father was well aware of my neuromuscular dental practice. He called from New York and told me he could no longer bring his teeth together normally. The pain was more dull than sharp. He experienced pain while chewing on both sides or tearing with his front teeth. The pain was strongest when first clamping down on food, but then lessened with subsequent chewing. He kept getting a dull ache when he pushed the jaw on the right side of the face to the left. Upon opening and closing his mouth, he could hear bone rubbing against bone in the left TMJ. When he opened his mouth as wide as possible he sometimes felt the left TMJ catch, occasionally the right

also. There was no pain or discomfort in the right joint. Opening the mouth wide to bite on food produced an ache, but doing the same maneuver without food did not. Directly after the initial event, there was a change in his bite. Upon waking in the morning he could close his teeth on the right side so that they met. However, soon after he would not be able to close down on the right side without difficulty, he would only hit on the left. So chewing food on the right side became a problem. (Figure 1 and 2)

We used the Myotronics K-7 to evaluate his function. EMG of resting muscle groups showed elevated levels in his temporal and cervical group. After 60 minutes, there was an improvement of

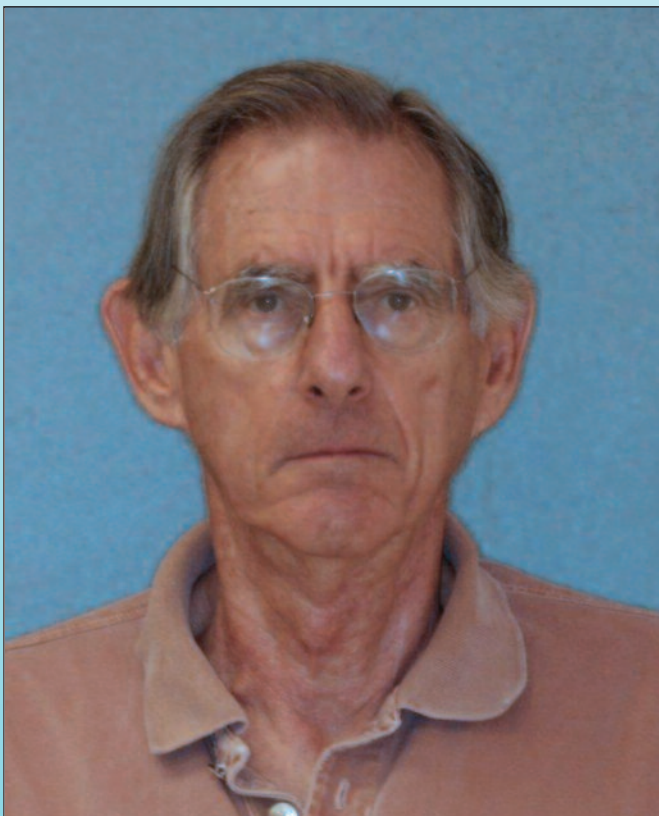


Figure 1.



Figure 2.

resting EMG's but the left cervical group remained elevated. His clench scores remained low both with and without cotton rolls between his teeth. There was excess freeway space and unstable occlusion along with dyskinesia. He had difficulty opening and was able to force himself to open to approximately 37 mm. The Sonography showed crepitus on both sides. The existing anterior vertical dimension was 16 mm when measured from tooth number eight to twenty five. There was an anterior/posterior discrepancy of 4.0 mm in the sagittal plane and 2.0 mm in the frontal plane in scan 4/5. The Myobite was taken at 18.8 mm to construct a removable orthotic. The scans are an integral part of the diagnosis and treatment to discuss the scans in detail would require a lot more time.

The I-CAT scan without the orthosis shows bony degeneration and joint compression. There is space between the condyle and the eminence, although there was still pain. (Figure 3) It would have been helpful to have the I-CAT in an open position especially when we consider his Sonography with late crepitus. That might have revealed greater dysfunction in his left TMJ as we will soon see. You can really begin to

second guess yourself and be self critical when things are not going as planned.

When I placed my father in a neuromuscular removable orthotic there was little improvement. In fact, the pain might have been slightly worse in the left TMJ although he was now on Myo-trajectory. The Myo-centric bite had brought him down and forward, but his I-CAT scan revealed a disturbing fact. (Figure 4) The left condyle was riding against the articular eminence in the Myo-bite position. We tensed and tensed and tensed in fact we tensed so much... once for about five hours while I was treating other patients in my office and completely forgot about him. Could we find a bite position that would relieve his pain within his joint? My father never really complained of muscular pain throughout this experience.

Repeated evaluations with the K-7 system showed that the orthotic was on Myo-trajectory. This created a dilemma; every Myo-bite taken left him in a bone to bone situation on the left side. We originally began with a removable orthotic to attempt to alleviate his condition. However, his bite relationship without the orthotic did not leave him with a functional occlusion to eat with. We made the decision to change to a fixed

orthotic with a new Myo-bite. (Figure 5) As you can see there were extensive degenerative changes now in the left joint as time went on. (Figure 6) We can see the condyle directly against the eminence and the formation of joint mice or calcified bodies and bone fragments floating within the joint space. His opening became even more limited.

It was getting very hard to believe that things were going to get better. Was surgery going to be the only option? Was my father going to have to live with pain and suffering? He was traveling from New York to Colorado once a month for treatment. The problem had really hit home and the pressure was building.

When we looked at his original radiograph, things almost looked better before treatment. Without the orthotic, he was in constant pain with no bite. He was in pain with the orthotic on Myo-centric trajectory but at least he could chew. Could his issues be related to the orthogonal axis of his cervical neck? Repeated tens of spinal accessory nerve XI showed no improvement or change in the Myo-trajectory, it was always the same. My father had no history of pain or cervical neck symptoms. I began to think about his dental history, the

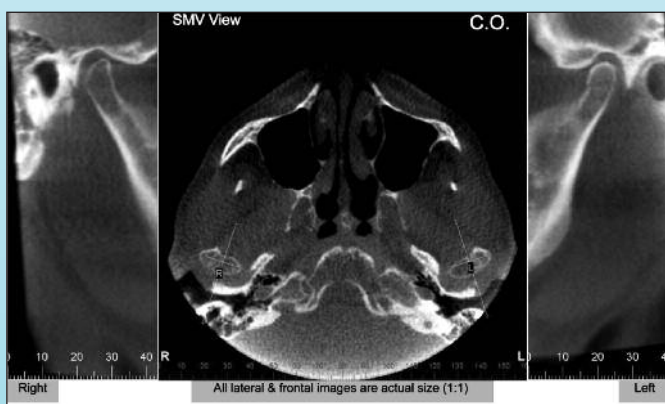


Figure 3 - Bony degeneration and joint compression.

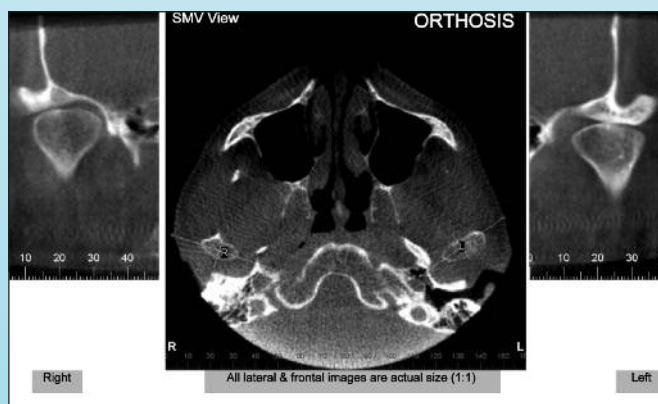


Figure 4 - Left condyle riding against articular eminence.

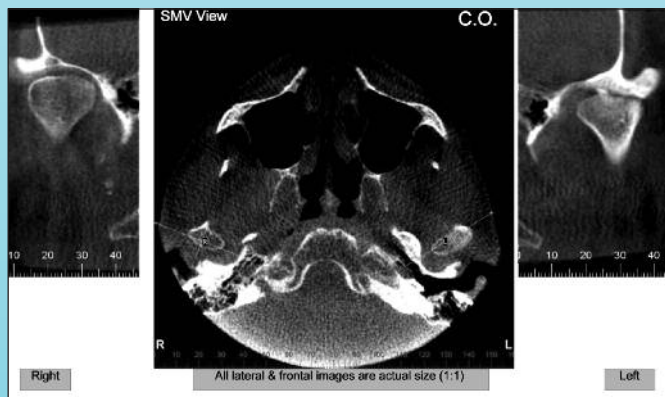


Figure 5 - Extensive degenerative changes now in left joint.

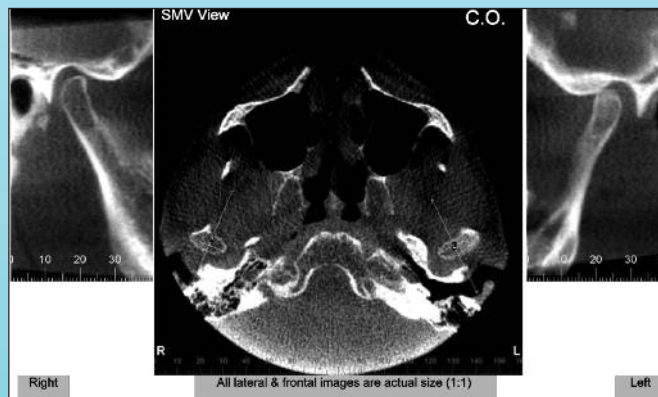


Figure 6 - Condyle directly against the eminence.



chronic break down of the left posterior teeth and subsequent crowning one after the other over the years.

The intra-oral signs were there long before his symptoms. (Figures 7 and 8) There was a loss of vertical dimension, occlusal wear of anterior teeth and abfractions, tori, lingual version of lower bicuspids, fractured teeth and deep bite. My father explained that he had chewed ice for years. As a teenager, when his wisdom teeth were removed, he began chewing almost exclusively on the left side after pain on the right. He continued this habit throughout his life until restored in a neuromuscular bite. The fact that we had crowned almost the entire left side as these teeth fractured over the years was interesting. Then he began fracturing the right side as well. I began placing crowns on the right side, one tooth after another. In August 2006, my father began complaining of pain in tooth number 31. There was a distal fracture extending through the pupil floor to the mesial. I placed a crown on number 31 and sent him home to NY. Shortly after the pain worsened and an endodontist determined the tooth was fractured through the root system. He removed the tooth and placed a bone graft. We placed an implant in the

extraction site in August 2007. Now my father had lost his posterior stop on the right side, setting him up for catastrophic failure. One month after the implant was placed with a healing abutment at tissue height, my father ate his infamous ham sandwich. The years of gradual loss of posterior vertical dimension, first on one side then the other, had finally taken their toll. As medical professionals we are told to "do no harm". Well, a whole lot of harm was done here over the years... one crown at a time.

Perhaps the years of pathologic muscle function combined with the degeneration within his joints was preventing me from finding the ideal functional position. The atrophy of the system was not allowing TENS to correct the X/Y plane. If the torque created by the occlusal breakdown had led to this problem then maybe torquing the occlusion the opposite way might correct him. I thought let's give it a try. The destruction of his teeth on one side of his mouth and then the other had created torque in his mandible. He was tensing at home with a BNS-40; so I called him and had him TENS with two Popsicle sticks or tongue depressors taped together and held between his teeth. First placed on one side and then the

other to see if there was any difference. He also adjusted the balance of the TENS to one side or the other to see if it would release the condyle on the left side. He noticed no difference.

On his next trip, I decided to alter his orthotic. It seemed to make sense that we needed to torque the left side to rotate the condyle away from the bone. If I torqued the right side it would seem to jam the condyle back into the eminence. We began with one hour of TENS. Then I began adding to the left side. I first re-measured my anterior and posterior vertical dimensions, because they had to be exact. I confirmed the measurements three times before starting. I added a small amount of composite resin to tooth number 19 since it would give me the most secure stop. I lightly pulsed him once with the TENS unit into the material and cured it. I checked my measurements and I had indeed increased the vertical on the left side by one millimeter. I then added resin to the second molar and the bicuspids, increased the gain, pulsed him hard into the material and then light cured it. He was now hitting right on the tips of all cusps on the left posterior with a one millimeter increase. There was now no contact on the right side. I



Figure 7.



Figure 8.



Figure 9.



Figure 10 - Left condyle moved dramatically, joint mice gone.

cranked the tens unit up until he was hitting hard and then altered the balance so the right side was only pulsing. I tensed him for another hour or so in a Zero Gravity chair. I then sat him up, balanced the pulse of the Myomonitor and checked his bite. (Figure 9) He was now hitting on both sides ... Harder on the left but some on the right. I decided to leave him like that and let his own muscle function do the work. That night he noticed no difference in the pain he was experiencing while eating. I was lucky I could monitor the patient this way. I was able to watch every bite. He



*Full face before.*

seemed like he was opening a little wider while eating. My father grabbed a raw carrot and crunched through it without complaining. I was afraid he was going to fracture the orthotic. The next day we tensed for one hour and began checking the bite. He was now hitting on both sides. With a slight adjustment to the right side and adding a little resin to the cusp tips of his right first bicuspid, he was now hitting evenly again.

My father returned to NY. I called him regularly for a week and asked how he was doing. My father could not tell me if he was improving so I stopped calling. Two weeks later my father phoned... he realized he was completely out of pain. He has been out of pain ever since.

Three months later he flew out and we started with new I-CAT scans. The results were amazing. (Figure 10) His left condyle had moved dramatically, the joint mice were gone. The K-7 scans showed great improvement in function. He was now able to open wide enough to restore him. He was on Myotrajectory. My father has had no recurrence of pain since adjusting his orthotic by correcting the torque. (Figure 11) We then restored to the new position using the LVI protocol for full mouth reconstruction. (Figure 12) My father remains pain free. What a difference one millimeter can make!



*Full face after.*

**Dr. Michael Adler** graduated from Georgetown University Dental School in 1987. He went into Public Service on a Navajo Reservation after graduation, later going into private practice in Boulder, CO. Initially focusing on General and Cosmetic Dentistry, Dr. Adler has seen his practice evolve strongly towards Neuromuscular treatment over the past few years. He has taken extensive Post Graduate Training at the Las Vegas Institute for Advanced Dental Studies including CORE I – VII; Occlusion I - III; Anterior and Posterior Aesthetics; Bonding; K-7 Training; CARP; TMD: Developmental Diagnosis; the Physiologic Approach to Treating OSA and Full Mouth Reconstruction.

Dr. Adler has also completed the neuromuscular orthodontics curriculum and attained his LVI Fellowship in 2010. He is a Fellow of the ICCMO and a member of the AACD, IACA, ADA and the Colorado Dental Association.