

# How to Stabilize the TMJ Prior to Treatment

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Most general dentists do not have any desire to treat patients with TM dysfunction. They do not feel that they had proper training in dental school and many are not interested in attending postgraduate courses. I developed an interest in the TM joint when I first attended courses sponsored by the University of Toronto 21 years ago with Dr. Don Woodside, the former Head of the Orthodontic Department. Dr. Woodside<sup>1</sup> was showing cases utilizing functional orthopedic appliances that advanced deficient mandibles. I was impressed with the fact that this treatment philosophy resulted in the patients having full lips, broad smiles and outstanding profiles. Dr. Woodside was a very prolific writer and published many articles on the advantages of this type of treatment. At that time, I was also fortunate to have attended lectures by Dr. James McNamara,<sup>2</sup> an orthodontist from Ann Arbor, Michigan, who also advocated the

use of arch development appliances to treat patients with constricted arches and functional appliances to reposition retrognathic mandibles forward.

After hearing Drs. Woodside and McNamara and having read several of their articles, I began

Patients with pre-existing articular disc displacements undergoing mandibular advancement surgery are likely to have significant worsening of the TMJ dysfunction post surgically.

to practice what is known today as the functional philosophy. The routine treatment for a Class II skeletal patient with an underdeveloped mandible was to develop the maxillary arch to a normal size and then reposition the man-

dible to its correct forward position, which corrects the Class II skeletal and Class II dental problem. If the patient had an overbite, the posterior teeth were erupted with vertical elastics. The response from both patients and parents was extremely positive due to the improved profile and facial appearance that was achieved.

What was extremely interesting was the fact that the patients informed me that this form of treatment had eliminated their clicking jaw, headaches, neck aches, ringing in the ears, etc. I then started to evaluate the health of the TMJ before and after treatment using a TMJ Health Questionnaire, range of motion, muscle palpation and x-rays of the TMJ (tomograms). I began to see a definite correlation between orthodontics and TMJ. When these patients were treated the way Drs. Woodside and McNamara advocated, the TMJ signs and symptoms significantly decreased.

This fact was clearly evident in the February 2004 issue of the American Journal of Orthodontics and Dentofacial Orthopedics by Dr. Sabine Ruf and Dr. Hans Pancherz.<sup>3</sup> The article compared the treatment of Class II skeletal patients using orthognathic surgery (sagittal splint osteotomy) versus the Herbst Appliance. The Herbst Appliance is a fixed functional appliance that was first introduced in 1905 and is an extremely popular jaw repositioning appliance used worldwide by orthodontists and general dentists. Dr. Hans Pancherz<sup>4,5</sup> is the orthodontist who made this appliance well accepted and has written numerous articles on the advantages of utilizing this form of treatment. The study compared the treatment of 23 adults with the Herbst Appliance versus 46 adults with orthognathic surgery. Both groups were successfully treated to Class I occlusal relationship with normal overjet and overbite and improved facial profiles.

One of the most significant findings was that patients with pre-existing articular disc displacements undergoing mandibular advancement surgery are likely to have significant worsening of the TMJ dysfunction post surgically. Conversely, the TMJ function was seen to improve with Herbst Appliance treatment. This and many other articles written by orthodontic clinicians around the world prove that anterior repositioning and functional appliances are indeed the treatment of choice for patients with internal derangements (disc displacements).

Today, my practice has evolved into exclusively treating patients with orthopedic, orthodontic or TM dysfunction. My practice has also incorporated sophisticated diagnostic equipment including a state of the art



FIGURE 1—Joint vibration analysis.

x-ray machine capable of taking non-distorted corrected tomograms, cervical spine, cephalometric, panoramic, PA skull, paranasal sinus tomograms, etc. This x-ray equipment is capable of examining hard tissues including the position of the condyle in the fossa, position of the neck, cervical vertebrae, cant of the occlusal plane, and the patency of the nose by evaluating the septum and the turbinates.

A jaw tracker and a device called Joint Vibration Analysis<sup>6</sup> is used to evaluate soft tissue regarding the position of the disc and the presence or absence of an internal derangement. Joint Vibration Analysis<sup>7</sup> is the recording of the vibrations of each temporomandibular joint. Normal healthy TM joints have smooth, well-lubricated surfaces with no vibrations upon opening and closing movements. However, mechanical displacements of discs or perforations in the disc or posterior ligaments generally produce friction and vibrations.

Different clinical disorders

can produce different vibrations and the Joint Vibration Analysis<sup>8</sup> is a useful piece of diagnostic equipment that is used to evaluate these vibrations to determine the seriousness of the problem. There are essentially five stages of disc displacement or internal derangement and it is important to determine which stage the patient is in prior to treatment. Stage One is clicking, Stage Two intermittent locking, Stage Three chronic closed lock, Stage Four early degenerative osteoarthritis, and Stage Five is perforation of the posterior ligament which leads to crepitus and advanced degenerative osteoarthritis.<sup>9</sup>

The easiest cases to treat are those in Stage One or Two, which are classified as disc displacement with reduction. This means that when the mandible is moved forward or the vertical increased, the disc can be reduced or recaptured.

Stage Three, Four or Five are classified as disc displacement without reduction. In these advanced stages, the disc cannot be recaptured when the jaw is repositioned. The disc cannot be reduced.

Most clinicians agree that headaches are one of the most common symptoms of TM dysfunction. When the muscles of mastication contract excessively, this can cause headaches, neck aches and shoulder problems. To help reduce the severity of muscle contractions, clinicians must establish a correct vertical dimension for each patient. Many adult patients are overclosed vertically and need to have their posterior vertical dimension increased. This can be done either orthodontically, prosthetically or restoratively. In my office, we use electromyographic equipment (EMG)<sup>10</sup> to evaluate the state of contraction or relaxation of the muscles of mastication.



**FIGURE 2**—Normal jaw joint. Normal posterior joint space.



**FIGURE 3**—Stage two. Condyle posteriorly displaced disc anteriorly displaced compression of nerves and blood vessels.



**FIGURE 4**—Stage five. Advanced degenerative osteoarthritis perforation of posterior ligament crepitus.

tion prior to, during and after treatment.

The key to obtaining relaxed muscles is to employ a functional treatment philosophy where it is necessary to establish a normal condyle-disc-fossa relationship by properly relating the mandible to the maxilla. This is done utilizing repositioning splints and functional appliances.

Since the patency of the airway is so important from a health standpoint, the nose is evaluated using a rhinometer.<sup>11</sup> This evaluates whether or not the nose is obstructed with either a deviated septum, large turbinates or swollen nasal mucosa due to allergies. If the patient is a mouth breather, then this has been shown to not only cause malocclusions due to a constriction of the arches but also causes the mandible to become retrognathic. These facts have been well documented in the literature by Dr. Don Woodside and others. It has also been shown that malocclusions can often lead to TM dysfunction. Therefore, the evaluation of the nose and the airway is critical to your success in treating malocclusions as well as TM dysfunction.

A pharyngometer is also utilized to evaluate the patency of the hypopharynx (area behind the tongue). This equipment determines what mandibular position

provides the most patent airway. The airway is evaluated prior to the utilization of a functional jaw repositioning appliance and then after the insertion of the appliance to confirm that the appliance has successfully increased the size of the airway. The pharyngometer<sup>12</sup> is critical in the evaluation of repositioning appliances including oral appliances used to prevent snoring and sleep apnea.

All of these diagnostic tools are utilized prior to the treatment of any orthodontic or TM dysfunction patient. At the end of treatment, these tests and x-rays are repeated to determine whether or not the treatment plan was successful in eliminating the problems.

My clinical experience over the past 26 years and having treated thousands of patients with TM dysfunction has convinced me that indeed there is a definite relationship between orthodontics and TM dysfunction.<sup>13</sup> The key is to treat these patients with a functional approach. If the patient is suffering from an internal derangement (intra-capsular problem) and the disc is not in its normal position (usually anteriorly or antero-medially displaced), then the mandible must be properly related to the maxilla in three dimensions: transversely, antero-posteriorly and vertically. When this is accomplished using functional appliances such as the Twin

Block, Herbst, MARA Appliances or anterior repositioning splints, this frequently solves the problem and the discomfort associated with intra-capsular problems.

Anterior repositioning therapy has a history of over 50 years. In 1957, Ireland<sup>14</sup> used anterior repositioning appliances to reduce displaced discs and reduce TM dysfunction.

Gelb<sup>15</sup> referred to his repositioning appliance in 1959 and this is now a consensus in the peer research literature that the Gelb 4/7 position correlates with the physiologic position of the condyle in the fossa (downward and forward).<sup>16,17</sup>

Okeson,<sup>16</sup> in a recent text, said that the best treatment for a displaced disc is to try and recapture the disc. If the condyle is posterior, as shown in the diagram, and the disc is anterior, then the only way to recapture the disc non-surgically is to advance the condyle and the mandible by utilizing anterior repositioning splints or functional appliances.

Lundh and Westesson<sup>18,19</sup> found that recapturing a displaced disc effectively eliminates TM dysfunction and pain when a normal disc-condyle relationship can be established. The use of flat plane splints was found to be ineffective in relieving the TM dysfunction.

Simmons<sup>20</sup> found in a study of 26 patients, 25 showed recapture of the disc in cases where they presented with disc displacement with reduction when anterior repositioning appliances were utilized.

Simmons,<sup>21</sup> in a larger study involving 58 patients using MRI (Magnetic Resonance Imaging), showed that after treatment of anteriorly displaced discs, 85% of the discs were recaptured when they presented with reducing disc displacement with repositioning appliances.

Okeson<sup>22</sup> states that the prime indicator for anterior repositioning appliance therapy is acute joint pain caused by disc displacement with reduction.

Pertes and Gross<sup>23</sup> wrote in a textbook that anterior repositioning therapy is indicated when pain is associated with anterior disc displacement with reduction.

Dr. Duane Grummonds,<sup>13</sup> orthodontist, in his textbook *Orthodontics for the TMJ-TMD Patient* stated that anterior repositioning therapy was appropriate for patients who had pain, clicking, locking, retrodiscitis, and arthralgia.

The research is clear that intra-capsular problems cannot be solved with flat plane maxillary splints. In fact, I have had many patients report to me that their jaws locked when they wore a flat plane maxillary splint to try and solve a problem of an internal derangement or disc displacement. These patients need to have their mandibles brought forward, which moves the condyle down and forward and the only way this can be accomplished is with a functional appliance or an anterior repositioning splint.

The reason the flat plane maxillary splints are not effective is that they cause the mandible to

TREATMENT OF PATIENTS WITH TM DYSFUNCTION		
Phase I	Diagnostic Phase	4-6 months
<b>Extra-Capsular</b>	Anterior deprogrammer worn at night Only contacts lower central & lateral incisors No contact with posterior teeth Occlusal equilibrium	
<b>Intra-Capsular</b>	Mandibular anterior repositioning splint Splint is indexed to hold jaw in correct position Functional jaw orthopedic appliances	



FIGURE 5—Pharyngometer.



FIGURE 6—Rhinometer.

go posteriorly and if the patient has a loose posterior ligament, this causes the disc to dislocate in front of the condyle resulting in an acute closed lock.

The most popular functional appliance used worldwide to correct Class II skeletal problems with underdeveloped mandibles is the Twin Block Appliance. This appliance was designed 26 years ago by an orthodontist from Fife, Scotland, Dr. William Clark.<sup>24</sup> In his textbooks and numerous articles, Dr. Clark mentions the significant improvement in patients' symptoms following treatment with the Twin Block, which moves the mandible forward.

Dr. Vondouris,<sup>25</sup> has also written articles on the advantages of functional appliances including the Twin Block and Herbst Appliances.

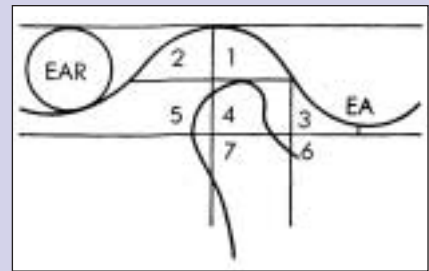


FIGURE 7—Gelb 4/7 position.

Seven years ago, Dr. Jim Eckhart, orthodontist, Manhattan Beach, California, developed a fixed functional appliance called the MARA (Mandibular Anterior Repositioning Appliance) to advance the mandible in Class II skeletal patients. Dr. Eckhart<sup>26</sup> stresses the positive effects the appliance has on the condyle-disc relationship in terms of causing a shifting of the temporal bones and bone deposition in the glenoid fossa distal to the condyle.

Several orthodontists from the Orthodontic Department at the

**REPOSITIONING SPLINT**

Phase II	Treatment Phase
<b>Orthodontic</b>	Utilizing functional jaw orthopedic appliances and fixed braces
<b>Restorative</b>	Crown and bridge, implants
<b>Prosthetic</b>	Overlay partial, complete dentures Partial dentures



**FIGURES 8A & B**—Anterior deprogrammer.



**FIGURES 9A & B**—Repositioning splint.

University of Detroit, including Drs. Berger, Chernak, Simon and Haerian,<sup>27</sup> did a study involving 30 patients treated favorably with the MARA Appliance where the mandibles were advanced.

The key to successful treatment of a patient suffering from TM dysfunction is making the proper diagnosis. The clinician must first determine if the patient is suffering from extra-capsular or intra-capsular problems. Patients with extra-capsular or muscle related problems usually have the condyle in a physiologically correct position in the glenoid fossa (downward and forward). When the condyle-disc relationship is normal, there is no noise, no clicking, crepitus or pain.

Extra-capsular problems can be caused by occlusal interferences in lateral or protrusive movements or parafunctional habits such as clenching or bruxing. The solution would be to wear an appliance at night called an anterior deprogrammer to help to eliminate the parafunctional habits. The anterior deprogrammer has an anterior biteplate with the only contact during swallowing being the lower central and lateral incisors. When the posterior teeth do not touch, the temporalis and masseter muscles are unable to contract excessively and this eliminates the habits such as clenching and grinding as well as the resultant headaches.

Flat plane splints are not effec-

tive in preventing either clenching or bruxism since patients will simply continue to clench and brux on the posterior acrylic pads of these splints. Rather than eliminate the parafunctional habits, this frequently aggravates them.

If the diagnosis is that the muscle spasms are being caused by occlusal interferences, then occlusal adjustments will be the treatment of choice to eliminate the extra-capsular problems.

As mentioned previously, with intra-capsular problems the disc is usually anteriorly or antero-medially displaced in relation to the condyle, which is usually posteriorly or superiorly displaced. There are five stages of internal derangement ranging from clicking, more clicking, intermittent jaw locking, chronic closed lock, and advanced degenerative osteoarthritis.

A more appropriate name for the splint is the mandibular repositioning splint. While relating the mandible to the maxilla, several movements including lateral, sagittal and vertical are made routinely in order to correct the cant of the occlusal planes, skeletal midlines, vertical dimension, condylar position, etc.

The objective of Phase I is to correct the structural problem within the TM joint by repositioning the mandible so that it is properly related to the maxilla transversely, antero-posteriorly and vertically.

Ideally, the treatment should reduce the signs and symptoms of TM dysfunction, improve the range of motion, reduce the muscle spasms, recapture anteriorly displaced discs, and establish a normal disc-condyle relationship.

The objective of Phase II is to hold the position that was ob-

tained with the splints and functional appliances in Phase I. Once the correct position has been obtained and normal disc-condyle-fossa relationship has been established and the structural problem has been corrected, it is vital that treatment be initiated to hold that position. Otherwise, the signs and symptoms of TM dysfunction will surely return.

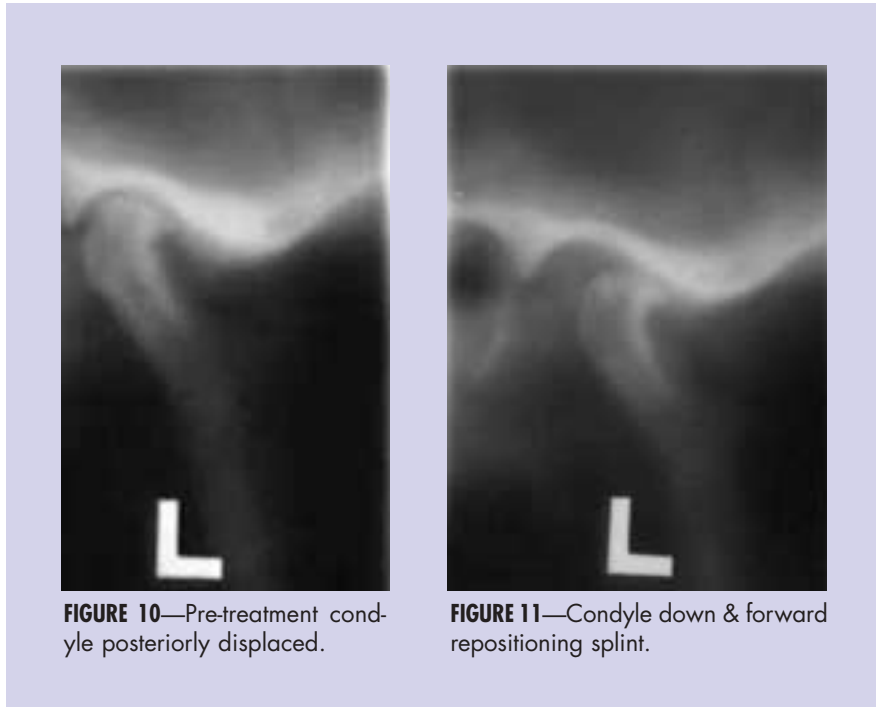
Following Phase I splint therapy, the patient is frequently left with a posterior open bite. Many inexperienced clinicians think that this posterior open bite has been caused by an intrusion of the posterior teeth due to the wearing of the mandibular repositioning splint for 4 months.

The posterior open bite is actually the result of the condyle moving downward and forward away from the painful nerves and blood vessels in the bilaminar zone located posterior to the condyles. To permanently resolve this intra-capsular problem, it is now necessary to hold the mandible in the correct position while the posterior open bite is closed, either orthodontically, restoratively or prosthetically.

### **Benefits of Anterior Repositioning**

Some of the benefits that have been reported following the use of anterior repositioning appliances include relief of joint pain, facial pain, tinnitus, dizziness, ear pain, dysfunctional posture including forward head posture, cervical pain, low back pain, and improved athletic performance. There have been numerous articles published on the advantages of anterior repositioning splints as opposed to flat plane maxillary occlusal splints.

A research paper from the University of Lund, School of Dentistry<sup>19</sup> and the University Hospital (Sweden) specifically compared the flat plane splint and the anterior repositioning appliance.



**FIGURE 10**—Pre-treatment condyle posteriorly displaced.

**FIGURE 11**—Condyle down & forward repositioning splint.

The article was published in 1988 in *Oral Surgery, Oral Medicine, Oral Pathology* (66: 155-162), written by H. Lundh, Per-Lennart Westesson, Sven Jirander, and Lars Eriksson [27] entitled “Disk repositioning onlays in the treatment of temporomandibular joint disk displacement. Comparison with a flat occlusal splint and with no treatment.”

Sixty-three patients had arthrograms taken which confirmed the diagnosis of disc displacement with reduction (Stage 2 of internal derangement) and were randomly assigned to three treatment groups. The arthrograms confirmed that all sixty-three patients revealed posteriorly displaced condyles and anteriorly displaced discs when they occluded in centric occlusion.

The arthrograms further concluded that all 63 patients had the discs recaptured when they moved their lower jaws forward to an end-to-end position with the upper and lower incisors. All patients in the study had malocclusions consisting of overjets and overbites that varied from 1 – 10mm.

- **Group 1** had silver onlays cemented to the lower posterior teeth in such a way that they held the lower jaw forward into the end-to-end position so that the anteriorly displaced discs would be recaptured. After placement of the disc repositioning onlays, the clicking stopped when the patients occluded on their front teeth, which indicated that the discs had been recaptured. Arthrograms taken with the silver onlays on the posterior teeth confirmed that the discs returned to their normal position between the condyle and articular eminence of the glenoid fossa.

Clinicians today find it much easier to fabricate lower anterior repositioning appliances out of acrylic since they are easier to adjust than silver onlays. The main advantage that silver onlays have over the removable splints is that they are fixed. If patients have problems speaking with the removable anterior repositioning appliances, a fixed alternative would be to attach acrylic onlays to the posterior teeth to ensure cooperation.



FIGURE 12—Overbite 4mm.



FIGURE 13—Repositioning splint.

- **Group 2** had flat plane maxillary splints fabricated for the upper arch. This splint was worn at night only for the purpose of decompressing the TM joints and was adjusted so there were no occlusal interferences in centric occlusion. One of the problems with flat plane maxillary splints is that the mandible has no definite spot in which to occlude and, in most instances, the mandible goes more retrognathic which causes the condyles to become more posteriorly displaced.

The arthrograms showed that at the beginning of treatment the condyles were posteriorly displaced, so why would you want to perpetuate this problem with the maxillary flat plane splint? Arthrograms taken with the flat plane maxillary splint confirmed that the anteriorly displaced discs were not recaptured because this splint did not allow for the posteriorly displaced condyles to come forward.

- **Group 3** was the untreated control group.

After six months of treatment, a clinical examination of the 63 patients revealed the following:

- **Group 1**, with the silver onlays that recaptured the anteriorly displaced discs (fixed reposition-

ing splint), had improved joint function, reduced joint noise and reduced muscle pain compared to the beginning of treatment. Prior to treatment, these patients complained of clicking and jaw locking.

After the six months treatment with the silver onlays (anterior repositioning), the clicking and locking were eliminated.

- **Group 2**, with the flat plane maxillary splint, showed no decrease in symptoms of TM dysfunction.

The vast majority of dentists in North America and throughout the world have been trained in dental school to fabricate the flat plane maxillary splint to help treat patients with TM dysfunction and bruxism. It is clear from this study as well as numerous others that this information is incorrect.

It is time for the entire dental profession to re-evaluate the literature and revise the curriculum to reflect current thinking in the treatment of patients with signs and symptoms of TM dysfunction.

- **Group 3**, with no treatment, obviously showed no decrease in signs and symptoms of TM dysfunction.

Following the six months treatment, the silver onlays were removed from 20 of the 21 patients in Group 1. One very intelligent patient refused to have the silver onlays removed since they had significantly reduced his symptoms. He simply left the hospital with his silver onlays intact and his condyles in the proper position.

When the silver onlays were removed, the twenty patients were left with a posterior open bite. This is normal for patients with anteriorly displaced discs prior to treatment and whose discs were recaptured following treatment with anterior repositioning appliances. The condyle moves downward and forward away from the nerves and blood vessels in the bilaminar zone distal to the condyle. This “new” condylar position is now very unstable and it is important to either correct this posterior open bite orthodontically, restoratively or prosthetically. Otherwise, the patient will attempt to get their posterior teeth to touch so they can chew their food and the condyles will once again become posteriorly displaced and the discs anteriorly displaced.

This is exactly what happened to 19 out of 20 patients involved in Group 1 of this study after 6 weeks. The pre-treatment signs and symptoms of TM dysfunction

returned, including headaches, ear pain, joint pain, facial pain, reduced range of motion, and the TM joints started clicking and locking again.

The conclusion of the authors was that for long-term success, they recommend a Phase II treatment in order to permanently change the occlusion in such a way to support the new condyle-disc-fossa relationship that was established with the fixed anteriorly repositioning splint. Many clinicians who treat these patients worldwide have formed a similar conclusion.

I have included in the bibliography several other articles that have arrived at the same conclusion as the one discussed above from the University of Lund, Sweden.

### **Weaning**

Some practitioners feel that following splint therapy, the mandible should be returned to its habitual position. One technique would be to wean the patient off the daytime mandibular repositioning splint by gradually reducing the wear time.

Patients whose symptoms are mainly muscle related due to clenching and bruxing, rather than TM joint related, may be successfully weaned off the repositioning splint. These patients are advised to keep wearing the anterior deprogrammer at night to prevent the muscle spasms that can lead to headaches, etc.

Class I skeletal patients who suffer acute injuries that cause the discs to become displaced due to inflammation are excellent candidates for the weaning technique. The lower splint helps to reduce the inflammation and encourages the discs to go back into position. When the clicking stops and the signs and

symptoms of TM dysfunction have been eliminated, the patient can gradually be weaned off the splint.

Weaning will not be successful in Class II skeletal patients with retrognathic mandibles who are chronic pain patients with long standing clicking or severe anteriorly displaced discs and posteriorly displaced condyles. To permanently resolve this intra-capsular problem, it is now necessary to hold the mandible in the correct position while the posterior open bite is closed. These

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cases will require Phase II orthodontic, restorative or prosthetic case finishing.

### **PHASE II TREATMENT PHASE JAW STABILIZATION**

(Permanent Solution)

1. Orthodontics
2. Crown & Bridge
3. Overlay Partial Dentures
4. Complete Dentures
5. Partial Dentures
6. Composite Buildups

#### **1. Orthodontics**

Following diagnostic splint therapy to solve the problem of dislocated jaw joints, most patients have a space between their posterior teeth. The jaw has been moved to a temporary position

where it is pain free. If the patient moves the jaw back to the original pretreatment position, the pain and all pretreatment signs and symptoms of TM dysfunction will come back.

Therefore, to obtain a more permanent solution, orthodontics is often the treatment of choice, placing braces on the teeth and using up and down elastics to allow the posterior teeth to touch so the patient will be able to chew properly and with no pain. This is a more permanent solution to jaw stabilization and TMJ health. This stage can last from 12 months to 18 months depending on the severity of the case. If the space between the posterior teeth is large (more than 3mm.), then this is often the treatment of choice.

#### **2. Crown & bridge**

If the space between the posterior teeth is minimal (less than 3 mm.) and if the posterior teeth have large restorations or missing teeth, then the best option might be to close the spaces between the posterior teeth with crowns, bridges and implants.

#### **3. Overlay partial dentures**

If the patient has limited financial resources, often the treatment of choice would be the placement of an overlay partial denture over the lower posterior teeth in order to fill the spaces between the posterior teeth and to stabilize the jaw (TMJ).

#### **4. Complete dentures**

If the patient has an old denture or dentures with the teeth all worn down, new dentures could be made with longer posterior teeth to fill in the spaces between the posterior teeth.

#### **5. Partial Dentures**

If the patient has missing posterior teeth, partial dentures could be



made to fill in the spaces between the posterior teeth.

**6. Composite Buildups**

If finances are a problem and the posterior open bite is not excessive (2-3 mm.) then the posterior teeth could be built up with composite relatively inexpensively.

Patients should be informed at the beginning of treatment that splints are used for diagnostic purposes only. This is a temporary solution to their problem (4-6 months). The objective of Phase I Diagnostic Phase is to try and find the ideal position of the mandible to the maxilla (transversely, sagittally and vertically).

Once that has been accomplished, a Phase II Final Finishing Phase must be implemented to permanently position the mandible in the correct position. As mentioned previously, clinicians must stabilize the occlusion and the correct condyle-fossa relationship by using orthodontics, crown and bridge or prosthetics including overlay partials, complete dentures or partial dentures.

**Some of the causes of TM dysfunction include:**

1. When the lower jaw is too far back in relationship to the upper jaw, the condyles become posteriorly displaced. This causes the discs to be displaced anteriorly when the patient occludes in centric occlusion. Typically, these are patients with Class II skeletal malocclusions with normally positioned maxillas and retrognathic mandibles.
2. Clenching and grinding habits.
3. Deep overbite that frequently causes the condyles to be posteriorly displaced.

4. Vertical or lingually inclined maxillary incisors which cause the condyles to be posteriorly displaced (e.g. Class II Div 2).
5. Constricted maxillary arch, which causes the condyles to be posteriorly displaced since the mandible cannot come forward to its proper position.
6. Forward head posture.

**CONCLUSION**

During the last 21 years of offering courses to general dentists in orthodontics and TM dysfunction, my observation has been that

**The ADA made the statement in 1991 that dentists have the prime responsibility to diagnose and treat problems of the temporomandibular joint to the limit of their ability.**

most dentists were not adequately trained or motivated to want to treat patients with TM disorders. Most feel inadequate to either diagnose or treat these patients.

This is a serious problem since approximately 44 million people in North America suffer from this disorder that can cause numerous symptoms including headaches, neck pain, earaches, congestion or ringing in the ears, pain when chewing, dizziness and fainting, difficulty swallowing, pain behind the eyes, and shoulder and back pain.

I firmly believe that the dental schools have to add this to the curriculum so that graduating dentists will be competent to diagnose and treat their patients. If the dentist is not trained to

help these patients, then the patients could get worse. TM dysfunction is a progressive condition that gets more serious over time.

The American Dental Association made the statement in 1991 that dentists have the prime responsibility to diagnose and treat problems of the temporomandibular joint to the limit of their ability. I believe that all dentists worldwide, including Canada, have the same mandate. Without adequate training, this will be an impossible task.

My experience has been that the medical profession is similarly not adequately equipped to treat these problems. They receive excellent instructions regarding all other joints of the body except the temporomandibular joint. Most medical doctors are trained to treat the symptoms with medications such as muscle relaxants, anti-inflammatories, pain medications, and even anti-depressants. This only provides a temporary solution and does not address the cause of the problem.

To permanently solve the problem, the clinician must first diagnose the problem and then treat it accordingly. The dental profession must be the primary care provider for TM dysfunction and be trained to diagnose and treat intra-capsular as well as extra-capsular problems.

Most dentists are taught in dental school that the correct position of the condyle in the fossa is rearmost and uppermost position and that flat plane splints and occlusal adjustments would solve most problems. This information is totally false. A careful review of the anatomy of the TM joint reveals that the rearmost, uppermost position could not possibly be the correct position since nerves and blood vessels occupy the area

posterior to the head of the condyle. The fact is that many patients suffering from internal derangements have the condyles posteriorly displaced and the disc anteriorly displaced.

The treatment of choice for the treatment of these patients, as outlined by numerous orthodontists and general dentists who treat patients with TM dysfunction, is to reposition the condyle downward and forward utilizing anterior repositioning splints and functional appliances such as the Bionator, Twin Block, Herbst and MARA Appliances. Following the use of these appliances, most patients experience a significant reduction in the signs and symptoms of TM dysfunction. Only a medical doctor can fix a dislocated shoulder; only a dentist can fix a structural problem within a dislocated TM joint.

I would advise all general dentists and specialists that, prior to any restorative, orthodontic or prosthetic treatment, to correct any malocclusions or TM dysfunction first.

Contractors would never consider constructing a new roof on a house unless it first had a stable foundation. I think the dental profession should treat similarly. Other professions must wonder how the dental profession, which holds the key to the elimination of so many "medical" symptoms, could fail to properly diagnose and treat a condition that affects 44 million people in North America.

It is time for the entire dental profession to step up to the plate and rectify this situation and take responsibility for the temporomandibular joint. Our profession must work with other health care professionals in helping to eliminate TM dysfunction and cranio-

facial pain that affects so many of our patients. **OH**

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*Oral Health welcomes this original article.*

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