Medical Orthodontics

By Daniel Noor, DMD

Hands-on Medical Orthodontics

Presented by Dr. Daniel Noor

Friday, March 10, 2017
@Crowne Plaza Syracuse,
701 E. Genesee Street, Syracuse, NY
And
Sunday, April 2, 2017
@New York Life Insurance Company
The Graybar Building at Grand Central Station,
15th Floor Meeting Room,
420 Lexington Avenue, New York, NY

Program 8:30 am to 4:00 pm.
7 MCE Credit Hours
Course Code 370

Dr. Daniel Noor is a leading provider of Invisalign® orthodontics treatment. He is among the top 1% of providers nationwide and won first place at the Invisalign® Summit International Convention for treatment of the most complex orthodontic cases without braces or surgery, yet achieving the best results. He has treated nearly 2000 complex cases no one thought possible since 2002 with his outside the box thinking and innovations.

In this 7 hour course, you will learn how easily you can use Invisalign® as an ideal orthodontic appliance for any patient of any age to treat and prevent over 30 medical and dental conditions. You will also gain knowledge of techniques such as lingual attachments innovated and currently only used by Dr. Daniel Noor to ensure predictable successful outcome treating even the most challenging cases with Invisalign®.

In biology, "Form follows function." This means, within an organism, structures are formed in direct correlation to what they are meant to do. In other words, the better the form, the better its function. The same is true when it comes to head and neck anatomy and physiology. In the most ideal anatomical and physical spatial relationships, correct teeth position, perfect occlusion, and ideal jaw relationship with proper alignment of the head and neck could prevent about 40 different medical and dental conditions. Therefore, orthodontics is not merely a cosmetic treatment, but rather a medical treatment for diseases of the head and neck, periodontal structures, oral cavity and much more.

We have treated about two thousand Invisalign® orthodontic patients over the past twelve years. The majority were adults treated to improve clinical health-related issues rather than simple cosmetics. However, it's fair to say that esthetics was 40% of the reason patients committed to treatment, and nearly 60% of the time, patients committed to treatment due to many health reasons which were explained to them.

In this article, we will discuss various clinical situations in which patients have benefited greatly and will continue to benefit for the rest of their lives. They have less pain and sensitivity and improved dental-medical conditions in many different areas. In fact, we have been surprised by various positive side effects which Invisalign® orthodontic treatment has delivered for many of our patients. Patients are also extremely excited and pleased by such positive side benefits that they have consistently referred many of their friends. Although the same results can be achieved with traditional brackets and wires, the majority of adult patients simply did not start treatment since their providers felt their case may be too difficult to treat with Invisalign®. Therefore, these patients felt they are too old for braces and it would impede them both esthetically and socially. Thanks to Invisalign® and our years of research and innovation, we can now treat any orthodontic case with Invisalign® clear aligner therapy. In fact, certain cases are better treated via Invisalign® rather than braces. For example, certain patients are heavy grinders and they need some occlusal protection during orthodontic treatment which Invisalign® can provide.

In addition, general dentists can benefit far beyond their dreams once they realize how easily they can treat many restorative and cosmetic cases when they understand the functional reason for orthodontics. We must ensure orthodontics is part of nearly every single patient's treatment plan no matter how old or how young the patient may be. We are finally capable of explaining many dental and medical conditions and their sources of pain to doctors and patients who would otherwise have no idea why those conditions exist. Many times they would have no solution for the patient except to refer them from one specialist to another while not finding a conclusive answer to the patients' source of discomfort. Instead, many patients such as those with chronic headaches, jaw pain, etc., would be put on a lifetime of medications such as steroids and pain killers.

Do you recall seeing patients with unexplainable sensitivity yet there was no decay anywhere and sometimes no periodontal issues? How about patients with migraines, jaw clicking, popping, snoring, sleep apnea, head and neck pain, sinus issues, ringing in the ear, etc.? Nearly every day, I see a patient who suffers from some sort of chronic issue near the head and neck area. I am intrigued when I hear many Invisalign® patients report many secondary benefits of orthodontics. Patients report improvements with certain medical conditions they used to experience yet no one would ever think could be related to their occlusion. Recently, a 26-year-old patient reported after wearing Invisalign® for about 11 months that she no longer had the pain and pressure she used to feel near her suborbital area. When I reviewed her initial photos and her Clincheck 3D modeling at stage 1 before starting her treatment, I noted she had class II occlusion on her left side but had class I with lingually inclined teeth on her right side. Viewing from the buccal and measuring from the gingival area of the upper left canine to the gingival area of the lower left canine, the distance was 4 mm longer on her left side versus the right side. In other words, the vertical dimension of occlusion (VDO) on the left side seemed longer than the VDO on the right side. Although there is not much research in this area, if you simply think of this as a structure leaning to one side versus another, you can clearly visualize the mechanical reason why there is much more pressure on one side versus the other side.

"Form follows function" is a principle associated with modernist architecture and industrial design in the 20th century. The principle is that the shape of a building or an object should be primarily based upon its intended function or purpose. The best analogy is to compare teeth to beams in a building. When you look at beams in a building, you know all beams must be perfectly parallel to each other and perpendicular to the ground or to the building foundation. Otherwise, this building will not last long and can easily collapse. Teeth that are not nearly vertical to the alveolar bone and are not nearly parallel to the opposite side of the arch can also be a huge problem.

If a building is constructed with beams that are not perpendicular to the ground and are not parallel to each other, especially in the presence of an earthquake, it would easily collapse due to excessive pressure from various beams into the foundation. In a simpler analogy, imagine a flag pole in the ground. If the pole is tilted in any direction rather than having a 90-degree angulation to the ground, the foundation around the pole where it meets the ground will be under so much stress that eventually we would see areas of recession and pocketing occurring where the pole meets the ground. This will get worse over time until the pole completely falls onto the ground. This illustrates the mechanical reason as to why periodontal disease is more prevalent among patients with malocclusion. A tooth that is tilted and is under incorrect occlusal forces, will exert constant mechanical pressure onto the gum and bone leading to pocketing and recession, alveolar bone loss, and abfraction. Such unintended forces create gingival pockets which would also collect more plaque and bacteria. A combination of forces from tilted teeth into the alveolar structure, plus bacteria accumulated over time will cause gingivitis and/or periodontitis. Therefore, it is important that both the general dentist and periodontist, and even physicians, understand how critical it is that all patients, especially those at high risk, have a perfect occlusion.

As we have learned from dental school and many CE courses, teeth movement can lead to increased chances of periodontal disease in the presence of less than ideal oral health. However, according to various sources and what we have seen in our own practice treating nearly 2000 orthodontic patients, orthodontics has also greatly helped reduce periodontal issues. As soon as we start moving teeth into a more ideal position, periodontal issues resolve in most cases, especially with scaling and good oral hygiene. In fact, many times periodontal surgery is rarely needed when we properly combine orthodontic treatment with proper SRP, good patient education and motivation.

Approximately half of the US adult population has some sort of periodontal disease[1,2], most of which is undiagnosed by their providers. More than 83% of the U.S. population has some sort of malocclusion. Nationally, adults comprise one in five orthodontic patients, but account for nearly 90% of the orthodontic patients in our practice. Of course, this may be due to the fact that we are practicing in the heart of New York City, but this still shows how important orthodontics has become in every adult's life. Both the patient and provider must understand that orthodontics can significantly help periodontal issues, but that poor oral hygiene care can increase periodontal conditions in the presence of orthodontic treatment. Therefore orthodontics should not start or may have to cease for non-compliant patients, especially for those with poor oral hygiene.

Probable contributions of orthodontics in the periodontics field are[3]:

1. It allows better oral hygiene by the patient, since it provides well-shaped dental arches. Without dental crowding, malocclusion as a periodontal disease facilitator is eliminated;

2. It allows vertical occlusal impact parallel to the long axes of the teeth. Therefore, the applied muscle force is uniformly distributed over the entire dental arch;

3. It facilitates a normalized vertical dimension when used in conjunction with prosthetic rehabilitation;

4. In selected cases, it ensures that the adequate dental crown to root relationship is achieved with induced orthodontic extrusion with no bone loss;

5. It facilitates correction or improvement of bony vertical defects via dental uprighting;

6. It improves the positioning of prosthetic pillars for fixed prostheses and for osseointegrated implants;

6. It decreases or eliminates the effects of bruxism, as pain or muscle spasms, during the orthodontic therapy;

7. With the current available orthodontic technology and with correct planning and execution, it allows precise, light, and efficient orthodontic movements.[3]

Our teeth and jaws are a mechanical device capable of cutting with anteriors and chewing with posteriors. Such a machine with complex moving parts and 28 to 32 cutting and chewing surfaces must have a perfect balance of all moving parts in order to ensure that our teeth and periodontal structures can survive several decades of cutting and chewing. Just like those beams in a building, our teeth are under heavy occlusal pressure. Teeth determine at what height our mandible fits into the maxilla, i.e. VDO. If some teeth are rotated or slanted but others are not, there are heavy occlusal forces on some teeth but not on others. This factor alone causes some teeth to be worn out more than others and shifted further due to excessive occlusal forces. Engineers do not want only a few beams in the building to get more force than others as this would jeopardize the building's safety and longevity. We have to think of our mouth as a building in an earthquake prone area due to constant chewing, cutting, and sliding of the upper and lower cusps over each other. Many also clench, grind, or are actively involved in sports which further put these fine mechanical parts in danger if forces are directed at improper angulations.

Engineers design beams in earthquake prone areas to allow for free sliding against each other. Typically, beams above slide adjacent to the beams below in a vertical fashion rather than colliding with each other. As an analogy, in a typical narrow arch case with crowding, lower teeth that are tilted lingually are no longer perpendicular to the floor of the mandible and they are not parallel to the opposing side of the same arch. If the upper and lower teeth are not positioned almost vertically from the alveolar bone but rather are tilted lingually or are in a crossbite, they are no longer capable of allowing their cusps to safely slide over the opposing arch cusps during chewing and cutting motions. They typically end up colliding with each other rather than sliding. Collision leads to faster wear and tear at the point of contact and causes vibration and tensile mechanical stress onto the beams (teeth) which transfer to the foundation (alveolar structure). This will weaken periodontal fibers as they are stretched on one side and there is heavy pressure right below the CEJ onto the alveolar bone towards the opposite side where the teeth are slanted. We clearly see now how periodontal structure is damaged if the tooth is not in an upright position and under heavy occlusal forces as well. Uncomfortable thick nightguards may be used as temporary bandaids for sleep time, but what about chewing forces and daytime grinding?

Furthermore, teeth that are under heavy occlusal forces due to mechanical stress will be weakened at the microscopic level. The enamel is strong but under tensile pressure will create vertical fractures near the occlusal surface and will create horizontal chipping and fractures near the gingival area, termed abfractions. Abfraction is caused by forces of opposing teeth biting together at a wrong angle and incorrect contact areas creating poor occlusal forces. Abfraction is a mechanical loss of tooth structure that is not caused by tooth decay. This leads to a concentration of stress and flexion at the cement-enamel junction (CEJ). The tension-compression theory explains why abfractions occur more on the buccal vs lingual areas due to the fact that the majority of times, teeth are tilted lingually leaving buccal areas under flexural stress. Bruxers grind to the point that the occlusal surfaces are flattened, hence a flat surface of a maxillary tooth over flat surface of a mandibular tooth does not give the same flexing action, which mechanically explains why there is less abfraction in such cases.

Many patients suffer from chronic long term migraines, jaw popping, clicking, headaches, earache, and many other medical issues for which most providers do not offer any long-term solutions except for pain medications and steroids. What if we could help the majority of these patients without any long-term drugs and with a simple non-invasive treatment without surgery? According to Robert Nicholson, PhD, "More than 38 million Americans suffer from migraines, affecting a wide variety of people of all ages and every walk of life, giving researchers 38 million reasons to find a cure."[4]

Orthodontics can help sleep disorders by expanding the arches, by advancing mandibles in children and also by creating more tongue space to advance the tongue in adults in such cases as crowding and retracted lower anteriors. According to Dr. Ronald Perkins, "If orthodontists can prevent a few more children from developing ADD, ADHD, and other cognitive problems by getting more oxygen to their developing brains,"[5,6,7,8,9] we can really make a difference and improve the quality of life for many people.

We are currently using simple Invisalign® orthodontics without any invasive procedures to treat many patients with migraine, headaches, jaw popping, clicking, sinus issues, head and neck issues, back pain, breathing issues, which lead to ADD, facial asymmetry, facial deformity, etc. We are not claiming 100% of the patients will get 100% better, but simple orthodontics can certainly correct and prevent many issues to a high degree. Many times, patients may have jaw surgery, but if the occlusion is not corrected, which was the main cause of wear and tear on the TMJ, the issue may not be 100% corrected and the problem will return. We often notice early signs of grinding and clenching in patients with poor occlusion. I explain to patients that grinding and clenching is the response of their jaws and neuromuscular structures to not being comfortable with how their teeth are fitting together, which affects poor jaw position. They are grinding and clenching to find a more comfortable jaw position, but since teeth do not fit together well, they will end up wearing and tearing the teeth until they are so flat they can easily accommodate where the TMJ wants to be. However, by then, both teeth and the TMJ are both worn out and will need lots of restoration/reconstruction in addition to orthodontic treatment. Therefore, it is best for patients and doctors to diagnose and recognize this problem and agree to an early preventive solution through orthodontics alone.

Upper and lower teeth that fit together better will help patients keep their teeth at least twenty years longer, if not a lifetime. This is due to the fact that form dictates function and teeth that fit together with proper jaw alignment, function better under less stress, hence teeth last much longer. As I explain to all our patients, the teeth are the hardest substance in the body. As such, why should they be the first part of the body which most patients have problems with since we see many patients lose teeth early in life?

Poor occlusion is the main reason for many dental and periodontal issues no matter how good hygiene care is. Teeth that do not fit together correctly are under constant stress and repeated trauma which also lead to failed root canals due to repeated trauma. Furthermore, stress in certain contact areas leads to grinding of natural teeth or restorations. Crowns, fillings, and veneers easily fracture or fail no matter how good the clinical work or the lab work is. Gingival margins recede after crown or veneer placement due to repeated occlusal trauma. Many dentists wonder how failed restorations are possible despite their great clinical work and paying so much for top quality lab and materials. We have seen great veneers fail that were treated by highly experienced cosmetic dentists. Patients get frustrated and dentists also lose time, money, and reputation having to redo the same treatment. Many patients end up switching dentists due to this mysterious failure only to find out the same or worse occur elsewhere. We are neither helping ourselves nor our patients.

Imagine performing veneers on upper incisors to treat fractured incisal edges and craze lines on a patient with an anterior edge to edge bite. While many dentists may perform veneers right away, not only do they not get the ideal esthetic results, the veneers also tend to fracture or come off easily. We have seen this too often when patients come to us stating my previous dentist did a poor job because the veneers keep coming off and state they lost confidence in their dentist. This could be easily prevented by performing a few months of Invisalign® to simply correct the edge to edge occlusion which is damaging to veneers, teeth and the TMJ. As we explain to our patients, teeth are like scissors. Our front teeth are made to cut just like scissors and as such they cannot function if they are hitting edge to edge and will not cut anything. Therefore, we must move teeth into proper function to ensure that the uppers slide over the lowers by about 1mm. If you are planning to do veneers, imagine how much easier and more predictable results will be by taking these simple steps.

The example above is just the tip of the iceberg when it comes to the importance of setting up perfect occlusion before ideal restoration and cosmetic dentistry. Going back to the building analogy, engineers first ensure the foundation is perfect and strong and all the beams are placed in perfect position and angulation before they add walls, windows, and esthetic features. In other words, in every dental case, we must visualize and ensure a strong periodontal foundation, ideal orthodontics by making sure the teeth (beams) are in correct position and angulation, and only then can we achieve or work on further cosmetics. Of course, all sources of decay and infection must be removed and at least temporarily corrected before orthodontics. Once orthodontics is completed, the final crowns or veneers are easily placed. Many times, we want to restore missing teeth with implants or even a bridge only to find out there is not enough room for missing teeth due to mesial drift and supra-eruption. Bridges made on teeth that are not in ideal occlusion will also cause immediate and long term periodontal issues and less than ideal occlusal forces which lead to many other issues, whether short term or long term. Recently I saw a patient who had two high quality PFM bridges done elsewhere to replace lower first molars. She was complaining about food trapping in the mesial areas of the second molars, along with pain and inflammation. Both second molars were endodontically treated. However, since they were both mesially drifted, they could not properly support occlusal forces which are now even worse with the bridge. No engineer makes a bridge with supporting poles which are tilted towards the center of the bridge, NOT even by one degree of tilt. Why would we want to create such poor structures in the mouth with such poor engineering? This will result in failure of many more teeth and causes more periodontal, jaw and neuromuscular problems for the patient both in the short-term and long-term. Research indicates the ongoing cost of pain management in such patients is staggering for both the patients and the insurance companies. The economic loss is yet another loss due to lack of productivity since such patients have constant pain and discomfort or grind and cannot even get a good night's sleep.

Poor occlusion is certainly very damaging to the TMJ and will cause jaw joint deterioration leading to TMD, which in many cases may require expensive and risky surgery. Simply stated, the TMJ in the presence of poor occlusion is the same as door hinges in the presence of a door that is very poorly aligned with its frame. In such a state, the door and its frame are always contacting and rubbing in the wrong areas. Hence hinges get so worn out and eventually pop off and break away. A new hinge is needed in addition to a new frame. Therefore, if orthodontics is not performed early in life, the TMJ can simply become too worn out over the years, hence the need for jaw surgery. If patients and medical insurance companies could understand such concepts, they would happily pay for orthodontics and implants in order to save themselves from long-term medical costs. It is therefore our job to educate patients and fight for medical insurance to eventually pay to prevent and to correct medical issues caused by orthodontic problems.

Since medical orthodontics is a mystery, we spend a lot of time educating patients as to why we always discuss orthodontics as an integral part of their overall dental treatment to ensure long-term medical health. By publishing such articles and presenting lectures with many specific cases we have treated, I hope we can educate both dentists and physicians so that they can better educate their patients. More importantly, we can better educate medical insurance companies to give them incentives to pay for such treatments which prevent countless medical issues and astronomical medical expenses by patients who suffer from migraines, headaches, jaw problems, earache, sinus issues, sleep apnea and possible ADD as a result of airway obstruction and poor sleep, etc.

Medical insurance companies spend a significant amount of money managing chronic pain from migraine, jaw issues, and unexplainable discomfort in the head and neck area. If not a majority, a significant portion of these patients can certainly benefit from medical orthodontic treatment and they can certainly benefit once medical insurance companies understand and pay for orthodontic procedures. When medical insurance companies realize they will indeed save money both short term and long term, they will be more than happy to pay for medical orthodontics treatment.

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Dr. Noor is a 2001 graduate of the Temple University School of Dental Medicine. He is not only a cosmetic dentist, but a leading provider of Invisalign® treatment. He maintains a private practice in Manhattan.

Disclaimer

The author is neither paid by any company, nor endorses any appliances, such as any types of braces or Invisalign®, and is merely expressing his findings and opinion to help both providers and patients prevent and find a cure for chronic head and neck related issues from which millions suffer.