From straightforward to complex cases

The new NimrodAligner and why it can be the ultimate orthodontic removable aligning system

By Nimrod Tal & Lauren Flannery

As a dental practitioner, helping your patient look to improve their smile by undergoing orthodontic treatment with one of the many aligning systems available can be a very daunting decision to make when it comes to choosing the right system. Whatever their lifestyle, the attributes most commonly sought after are typically comfort, discreetness and for the treatment time to be as speedy as possible. Depending on the case, it can sometimes be quite difficult to achieve all of these aims within one single aligning system, as each are designed to achieve very specific and individual movements, and not all are designed to do this with the whole arch.

An orthodontic laboratory, we are introduced to hundreds of very individual cases on a weekly basis, where more often than not patients will have specified that the above attributes are key to their decision making process when we assess for the appliances that will be best suited to their particular case. After having been faced so regularly with the task of assisting our clients to make the decision that will benefit their patients in as many aspects as they can, we had a thought—what if the advantages of each of these aligning systems were combined, and the disadvantages eliminated? It was from this that the idea of our brand new NimrodAligner stemmed.

Designed to move from 5.5 in all directions, and also widen the molars (Fig. 1), the NimrodAligner comprises of lingual and labial arch wires attached to individual cups that seat on each tooth with the aid of a composite anchor, and a connecting bar to seat on the palate or the lingual area, that are attached to molar cups. After having spent four years researching the most effective components and combining them using 3-D printers, we have combined the biomechanics of straight wire, Clear Aligners and a spring aligner with 3-D printers, we have combined combining them using prototypes.

The NimrodAligner has the fixed brackets arch wires biomechanics incorporated within the removable appliance so clinical time is extremely minimal! The teeth and gums can also be cleaned to the proper standard and at only 2.5 mm in thickness (Fig. 5)—as opposed to the standard 3.5 to 3.75 mm thickness of fixed brackets—so the overall feel is very anatomically friendly.

Clear Aligners are the most anatomically friendly appliances on the market today, and are mostly popular because of just how discreet they are. Despite these advantages, the force and pressure induced during the initial days of wear can be very painful. Although a sign that they are working as they should, the aligners tend to become passive as time passes and are typically only at their most active in just the first seven days. On the other hand the NimrodAligner, NiTi wires ensure that the pressure is gentle, yet provide continuous support.

Multiple Clear Aligner trays can also become very tedious for both patient and dentist, particularly when frequent appointments are necessary and stages of interproximal reduction (IPR) have to be carried out. IPR can be a huge factor in the progress of Clear Aligners as each aligner is made to incorporate the necessary IPR after each stage and the fit of following trays will be affected if not enough has been done. This is not a problem for the NimrodAligner as it will not affect the fit of the appliance if there has been insufficient IPR on the previous appointment. The patient can continue to wear it and IPR can be completed wherever necessary on the next appointment.

Similarly, spring aligners can also continue to be worn and fit correctly in between appointments if not enough IPR has been done previously, however they’re widely known for limited movement to just four incisors. It may be good for labial/lingual movement using the ‘squeeze’ effect, and some rotation, but Clear Aligners can often be required to finish.
In some instances, a separate expansion appliance may be required prior to treatment, which essentially boosts costs and adds time onto treatment overall. We have reduced this concern by offering this stage for such cases within the NimrodAligner singularly. The arch can gain molar width by pre-setting the molars in a wider position when it comes to making the movements on our 3-D system, and the connecting bar can act as a spring thanks to its flexibility. The rest of the teeth will continue to be aligned during this process.

In more complex cases however whereby a separate expansion appliance is unavoidable, two Nimrod-Aligners will be provided. The caps will not fit on the teeth that are blocked in otherwise, so the initial appliance will create space for the blocked teeth. Once they have been exposed, the second appliance would be provided to sit on all of the teeth.

During our research and production stages, we aimed to create the ultimate orthodontic removable aligning system that could potentially be the answer to the prayers of dentists and patients alike. We have reduced clinical time dramatically by removing the time-consuming hassle of fitting appliances such as fixed brackets by providing a bespoke pre-aligned appliance that simply needs to be placed on the teeth. We have taken into consideration the fact that multiple appliances can sometimes be necessary to achieve the desired result, and have eliminated the need for this by designing the Nimrod-Aligner in a way that allows the entire arch to move in any direction. In case expansion is also required, we have this incorporated (Fig. 1).

We have adapted the force and pressure of the movement to be effective for just sixteen hours a day, allowing the patients to remove the appliance for an entire eight hour working day if they wish, to grant the roots a sufficient amount of time to recover.

By combining all of the positive aspects of the orthodontic appliances mentioned above, the Nimrod-Aligner can be suitable for most cases from straightforward to complex.
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“We will be able to treat pretty much everything in the future”
An interview with Dr Graham Gardner, UK, President of the European Aligner Society

The European Aligner Society is an international organisation established in 2003 with the aim to promote education and research in aligner therapy. Trained in South Africa and with 22 years of clinical experience, Dr Graham Gardner has been running his own private practices in the UK since 2008. In an interview with Dental Tribune, the EAS President shares his ideas and views about the importance of aligners in orthodontics and about the EAS, which he believes will become the society for aligner therapy.

Dental Tribune: Dr Gardner, you have been working with aligners for more than a decade now. What convinced you initially of this treatment method and what are the main advantages in your experience?

Dr Graham Gardner: From the beginning of my career in the early 1990s, a time when ceramic bracket systems and lingual braces became available, I was certainly aware of the fact that aesthetic appliances were going to be the future of orthodontics.

In 2001, I was fortunate to attend a certification course for Invisalign, which was truly a water-shed moment in my orthodontic career because I saw the value and potential of aligner therapy for both dental professionals and patients. In my opinion, aligner therapy opened the door for a huge cohort of patients who would not have considered orthodontic therapy in the past owing to aesthetic concerns. In addition to aesthetic benefits, aligners are far more comfortable than fixed appliances, as they are removable and hence facilitate oral hygiene during therapy. They also move the teeth more gently with less pressure, which is favourable with regard to patient comfort and from a biological perspective too.

Today, I treat over 75 per cent of patients with Invisalign in my practices.

In recent years, clear aligners have become a favourable treatment alternative to fixed appliances, and the global orthodontic supplies market is expected to reach about US$9.9 billion ($3.6 billion) by 2020. In your professional opinion, how will this market develop in the near future?

Over the past decade, aligners have become mainstream orthodontics and I definitely see this trend continuing and expanding. With the technological advancements, including 3-D printers and CAD/CAM, that allow the clinician to diagnose, plan the treatment and we can treat the majority of malocclusions.

At the moment, however, aligner therapy is still a fairly expensive form of orthodontics. Thus, I hope that improvements in materials and 3-D printing will render manufacture and the product itself more cost-effective. For example, 3-D printers could allow individual practices to print their own aligners in the future.

Overall, with technological advancements and increasing patient acceptance, we will be able to treat pretty much everything in the future in my view.

How have developments in the European and overseas market differed?

Dr Gardner: Dentistry as a profession is very conservative and dentists in the US, for example, are perhaps a bit more progressive. However, with regard to aligners, I no longer see a great difference between Europe and America. The movement is global and I suspect the advancements we are now seeing in Europe will match those in America and Asia, where aligner therapy is also very popular. There are always regional differences, also partly related to legal restrictions, but the trend towards aligner therapy is a global phenomenon.

Dr Graham Gardner:

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The main motivation behind the founding of the EAS was to establish a neutral body—an international society that is independent of any information about aligner therapy and that members can consult for guidelines. Research is our third column, which is currently lagging behind. Eventually, we hope to have our own aligner journal or magazine and grant annual awards for excellence in aligner therapy.

The EAS is a fairly young organisation and hosted its first congress on 13 and 14 February in Vienna. What was the idea behind this event? The EAS’s primary objective is education because, obviously, education underpins every profession and without it we simply stagnate. Therefore, we decided that our first event should be a congress held in the heart of Europe offering a broad spectrum of informative lectures and a showcase of different systems and products. At the first congress in Vienna, internationally distinguished speakers shared their views and expertise about aligner therapy. Moreover, the event offered manufacturers an independent forum for exhibiting their solutions.

Can dental professionals look forward to another EAS congress next year? Based on the success of the inaugural event over the past weekend, we definitely want the congress to become a regular event in the calendar. While we are planning to hold the EAS congress every two years, we will be organising smaller regional forums on a continuous basis throughout every year.

Thank you very much for the interview.
Individuals play the game, but teams win championships

What it takes to build the ultimate practice unit

By Lina Craven, UK

It is said that all teams are groups, but not all groups are teams. What separates the two is interdependence. A true team is focused on a common purpose; team members support one another and enhance each other’s work and contribution. Andrew Carnegie captured this accurately when he said, “Teamwork is the ability to work together toward a common vision. It is the fuel that allows common people to attain uncommon results.”

I know that achieving the ultimate team is possible, because when I was a dental nurse many years ago in America, I was part of an ultimate team. What made us great was our leader, Dr. Derick Tagawa. He and his partner had a very clear vision and they knew exactly what was needed from each one of us to ensure the practice achieved its desired results. In turn, each one of us knew that every challenge we faced was an opportunity for personal, professional and practice growth.

Practices with a motivated, focused and empowered team produce excellent results; consequently, patient satisfaction is high and practitioners realise increased financial rewards. Achieving such a team is not pie in the sky but it does require complete commitment from the whole team. Based on my own experience of being a part of a high-performing team and my observations as a consultant to practices, here are my key principles for the creation of an ultimate team.

Do not confuse being the boss with being a leader. Leaders set the tone for the practice. They lead by positive example. Successful teamwork starts at the top with leaders who provide strategic vision and establish team goals. Effective leaders clearly define their vision and share it with their team to establish a common purpose.

Any successful relationship can only survive if values are shared, believed and agreed upon; values like honesty, integrity, commitment to each other, commitment to the practice success. Shared values help to build an effective team and to establish its culture, conduct, rules and policies. The key is to ensure the entire team agrees on the same values and is prepared to work by them. According to the world’s finest flight demonstration team (the Blue Angels, US Navy), “without shared values, peak performance isn’t possible” and “a team’s values must align with its purpose, mission, and actions”.

Every team member, from the leader to the cleaner, must learn to communicate clearly and effectively. Successful relationships are built on positive, honest and open feedback. Is information shared openly and honestly in your team? Does gossip or negative chatter exist in your practice? Team members must learn to address concerns, deal with conflict and accept responsibility for the success of other team members. When conflict occurs, it must be dealt with honestly, directly and openly so that each and every member is in line with the team’s adopted values.

Foster positive attitudes and creative thinking—attitudes that can either make or break the team dynamics, so there is no place for negative people. Do all your team members have a clear and up-to-date job description? Are they all qualified to undertake their roles? Are there written procedures for every area of the practice? Often hear team members say they are not sure who is responsible for something, or they do not have a job description, or they were promised training when they started, but have not yet received any owing to the practice being too busy.

Do all your team members have a clear and up-to-date job description? Are they all qualified to undertake their roles? Are there written procedures for every area of the practice? Often hear team members say they are not sure who is responsible for something, or they do not have a job description, or they were promised training when they started, but have not yet received any owing to the practice being too busy. Cross-training increases efficiency and makes each person more productive and valuable to the team.

Each team member is a cog in the practice’s wheel of success. However, many are often underutilised to his or her full potential where staff were expected to be (from the rota) and anyone off that day. It only took 5 minutes for the update and 5 minutes more to review the day before regarding what had worked well and what had not. It helped us to focus on the day ahead.

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Consistency is critical to creating the ultimate team; it fosters credibility and trust. Ken Blanchard and Sheldon Bowles wrote in their book ‘ Leading from the Heart’, “customers allow themselves to be seduced into becoming raving fans only when they know they can count on you time and time again”. This is also true for teams; just replace the word “customers” with “team members”. I often hear people say things like “one day we’re instructed to something and the next day it becomes something else”. If you want to be part of the ultimate team, be consistent. It is said that what motivates individuals the most is recognition—a pat on the back or a word of praise here and there for a job well done. Embrace this principle and, although it may feel awkward at first, if it is done often enough it becomes a habit. Sam Walton, founder of Wal-Mart Stores, said: “Appreciate everything your associates do for the business. Nothing else can quite substitute for a few well-chosen, well-timed, sincere words of praise. They’re absolutely free and worth a fortune.”

Building the ultimate team does represent a challenge, but once achieved it is hugely rewarding. There is no point implementing one principle in isolation. It is like baking a cake without the eggs.
Conservative smile design for the general dentist

By Dr Rami Chayah, Lebanon

Abstract

This article discusses the advantages of short-term anterior tooth alignment using the Inman Aligner system, particularly for general dentists. The article will give a brief description of the Inman Aligner appliance and its use in short-term orthodontics, and it will answer three major questions the general dentist should ask himself or herself during the treatment planning process. In support of this treatment modality, three case scenarios general dentists see daily will be given as examples.

Introduction

General dentists face the daily challenge of performing instant veneers for patients with misaligned anterior teeth who refuse orthodontic treatment, many of whom regard fixed orthodontic treatment as too long a commitment for achieving their desired aesthetic results. In today's fast-paced life, some patients are not prepared to wait or to go through long treatments. One of the greatest benefits of short-term anterior alignment is that many people who would refuse comprehensive orthodontic treatment may accept short-term removable alignment techniques such as the Inman Aligner system.

The Inman Aligner is a simple removable appliance, a modification of the removable spring retainer. It uses super-elastic coil springs to apply highly efficient light and consistent forces on both the labial and lingual surfaces of the anterior teeth (Figs. 1 & 3). The appliance is fabricated on a cast on which, based on a surgical model, the anterior teeth needing correction have been removed and reset in the ideal position in wax on the working cast. When the patient wears the appliance, the built-in forces generated by the spring coils will correct the misaligned anterior teeth (Fig. 3).

What distinguishes the Inman Aligner appliance from other short-term orthodontic systems such as Invisalign (Align Technology) and Six Month Smiles is its low cost, low risk and short learning curve for general practitioners. Only one appliance is used from the start to the end of the treatment. Sometimes, several clear aligners may be used to rotate resistant canines. The system is well received by patients because it is fast and relatively cheap. It also accommodates today’s active lifestyle. Usually, most cases take from six to 16 weeks. Patients can take the appliance out during meals or work meetings.

As with any other treatment technique, the Inman Aligner has its limitations. Hence, case selection is imperative, as the Inman Aligner is not suitable for posterior orthodontic treatment or Class II or III treatment. Only certain types of movements are possible and some patients will still need conventional orthodontic treatment or Class II or III treatment. Certain criteria should be met before treatment proceeds. At consultation, other orthodontic alternatives should be offered. The dentist must quote for the long-term retention maintenance and should look for any skeletal discrepancies. Compromises must be signed off.

Dentists need to consider three questions about treatment during the treatment planning process. The first question: can the patient’s teeth be brought into the ideal position within the treatment time frame? The second: can the patient wear the appliance during the treatment time frame? The third: is the patient prepared to accept the results following treatment?

Fig. 1: Inman Aligner appliance.—Fig. 2: Illustration of the Inman Aligner showing the appliance components.—Fig. 3: Inman Aligner appliance in the mouth. Case 1.—Fig. 4: Frontal view with the teeth in occlusion before treatment.—Fig. 5: Frontal view with slightly open bite showing the status of the teeth before treatment.—Fig. 6: Frontal view with the teeth in occlusion after alignment and bleaching.—Fig. 7: Close-up frontal view of the maxillary teeth after ABB.—Fig. 8: Right side view of the maxillary teeth before ABB.—Fig. 9: Right side view of the maxillary teeth after ABB.—Fig. 10: Left side view of the maxillary teeth before ABB.—Fig. 11: Left side view of the maxillary teeth after alignment and bleaching.—Fig. 12: Full face before treatment.—Fig. 13: Frontal view showing the patient’s natural smile before treatment.—Fig. 14: Frontal view showing the patient’s natural smile after treatment.—Fig. 15: Full face showing the patient’s natural smile after treatment.—Fig. 16: Occlusal view showing the maxillary arch before treatment.—Fig. 17: Occlusal view showing the maxillary arch after treatment.
fixed without orthodontic treatment in a very short period? In order to get a general answer to this question, he or she should first establish whether the patient does not wish to pursue orthodontic treatment because of the time commitment and cost. Would he or she also refuse short-term anterior tooth alignment? Would the occlusion be improved even though a Class 1 molar or Class 1 canine relationship may not be achieved? Patients may prefer short-term alignment techniques because of the shorter treatment time and lower cost.

Case 1

The first case presented is a good example of a scenario relevant to the question above. The patient was a young woman at college who presented at my office requesting a full smile makeover of 20 veneers. She desired a “Hollywood smile” as expressed in her own words. Her complaint was the extracted maxillary right and left central incisors, the incisal edge wear on the maxillary central incisors and mandibular anterior teeth, the pointy shape of the maxillary and mandibular canines, and the yellow colour of her teeth overall (Figs. 4 & 5). It could be argued that it would be highly unethical to prepare the sound enamel, transforming her maxillary teeth into stumps, for the rest of her life, especially at this young age. After long discussion and explanation of the disadvantages of the shortcut route of preparing her teeth for ceramic veneers, this option was excluded. Several other options were available and discussed with her, but because she wanted a smile enhancement in a short period of time, conventional fixed orthodontic treatment was also excluded. After checking her bite, it was observed that there was insufficient interocclusal space to shift the maxillary central incisors forwards without opening the bite. However, the patient accepted use of the Inman Aligner system owing to its flexibility in that the wearer is able to remove the appliance for several hours a day and because of its short treatment time. The maxillary left central incisor would have been aggressively prepared had it been treated restoratively. By using a simple anterior alignment technique, the treatment took only eight weeks to straighten the teeth and a great deal of sound enamel tissue was preserved by conservatively resolving the unesthetic appearance of the maxillary teeth (Figs. 22 & 23).

The treatment plan was to follow the ABPP protocol (alignment, bleaching and bonding). This concept still constitutes a smile maker but in a very conservative manner. Taking into consideration her age and her sound enamel tissue, this was agreed to be the most progressive means of carrying out her smile enhancement. First, her maxillary teeth were aligned using the Inman Aligner with an expander for nine weeks. Two extra-clear aligners were used in the last three weeks of alignment, because the patient chose the conservative Inman Aligner system owing to its short treatment time. The patient was also excluded. After check-up at week 12, the patient presented in this case was bothered by the look of his overlapping maxillary central incisors (Figs. 20 & 21). His mandibular teeth were also crowded, but for some reason, his concern was only with his maxillary teeth. He had started to hide his smile in front of his friends, feeling embarrassed to show his maxillary teeth. After the full orthodontic examination and discussion about all of the treatment options, the patient refused fixed or comprehensive orthodontic treatment, the patient chose the minimally invasive Inman Aligner system owing to its flexibility in that the wearer is able to remove the appliance for several hours a day and because of its short treatment time. The maxillary left central incisor would have been aggressively prepared had it been treated restoratively.7–9 By using a simple anterior alignment technique, the treatment took only eight weeks to straighten the teeth and the patient was able to take the appliance off during the day while eating.

The third question to be considered was the teeth require restorative work anyway, even after alignment?

Case 2

The second question to be considered regarding treatment would some of the teeth be aggressively prepared or end up with root canal treatment if treated with restorative dentistry without alignment and would the overall outcome be better with alignment rather than without? This question addresses the ethical dilemma general dentists face every day. We often have cases with overlapping anterior incisors in our office.

The patient presented in this case desired a “Hollywood smile” as expressed in his office requesting a full smile makeover of 20 veneers. He had started to hide his smile in front of his friends, feeling embarrassed to show his maxillary teeth. After the full orthodontic examination and discussion about all of the treatment options, the patient refused fixed or comprehensive orthodontic treatment, the patient chose the minimally invasive Inman Aligner system owing to its flexibility in that the wearer is able to remove the appliance for several hours a day and because of its short treatment time. The maxillary left central incisor would have been aggressively prepared had it been treated restoratively. By using a simple anterior alignment technique, the treatment took only eight weeks to straighten the teeth and a great deal of sound enamel tissue was preserved by conservatively resolving the unesthetic appearance of the maxillary teeth (Figs. 22 & 23).

The treatment plan was to align the teeth first and then to reassess the restorative work needed. The appliance was used for 12 weeks and only worn for 3 to 8 hours a day. During the last three weeks of alignment, the patient began to bleach his teeth. By week 12, the teeth were straight and the incisal edges of the maxillary central incisors were restored. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested dental incisal edge bonding using composite. He felt that the teeth were still flat and wanted a fuller smile. Because we had aligned the teeth, only minimal preparation was needed as evident from the wax-up and the decision was made to fabricate ceramic veneers instead (Fig. 28).

Case 3

The third question to be considered was the teeth require restorative work anyway, even after alignment?

The case presented serves to demonstrate the necessity of aligning the teeth even before placing ceramic veneers. The patient in this case exhibited moderate misalignment of maxillary anterior teeth with excessive overjet and overbite. In the occlusal view, the maxillary incisors were prominent. In addition, the teeth were darkened throughout years of staining being absorbed through the worn dentine of the incisal edges (Fig. 25). The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost. The aggressive preparation of the incisal edges (Fig. 25) was avoided. The patient initially requested ceramic veneers to resolve his smile problem, but after mocking up the design directly in his mouth, he was discouraged from pursuing this option owing to the amount of tissue that would be lost.