Interview: I try to think of solutions for common problems

By Nathalie Schüller, DTI

Dr Luis Carrière is the inventor of both the Carrière SLX Self-Ligating Bracket System and the Carrière Motion 3D appliance. He travels the world teaching at several universities and lecturing internationally on these products and orthodontic topics. Carrière maintains a private practice in Los Angeles in the US. Carrière presented three new products developed through his collaboration with Henry Schein.

Dr Carrière, when we met last year at the European Aligner Society congress, we talked about the ability of aligners to speed up the treatment process. You are now presenting new products, the Carrière SLX 3D Bracket System, the Carrière M-Series Wires and the SLX Clear Aligner System. Do these new products help to speed up the process?

I feel that one of the most important trends in orthodontics today is the provision of quality. Nowadays, more and more companies are producing aligners and selling them directly to the consumer, bypassing the orthodontist. This is of course jeopardising how an orthodontic treatment should take place, one in which the patient is protected at every level of treatment. Orthodontic treatment is not only about aligning teeth and establishing good occlusion. Teeth are connected to the patient by bone, being anchored in the maxilla and the mandible. If the relation of the mandible and maxilla is incorrect, the temporomandibular joint structure is disrupted, which will affect the patient in many ways, including clicking, pain and jaw dysfunction and the subsequent effects on well-being, life expectancy, etc. The expertise of the specialist is therefore of the utmost importance.

The Motion appliance adopts the Sagittal First philosophy. Solving the sagittal problem will make it easier and simpler for patients to finish a case. If we add self-ligating, high-end brackets combined with a smooth and steady archwire sequence that load physiologically friendly forces, we will be able to avoid compression of the blood vessels, which would diminish the blood flow in the area of movement. We start 95% of our cases with Sagittal First to adjust the sagittal condition, then switch to the new Carrière SLX 3D Bracket System or aligners. This combination is intended to simplify the overall orthodontic procedure.

Henry Schein now has its own aligner system, right?

Yes, the SLX Clear Aligner System, which reduces and can even eliminate the need for attachments in most cases. Attachments can still be placed if the dentist feels more comfortable placing them, but they are not necessary.

Starting treatment with the Motion appliance for both approaches, brackets or aligners, will give the patient the option to decide whether he or she wants brackets or aligners right after the sagittal correction.

Isn’t the orthodontist in a better position to decide which is better, brackets or aligners?

It used to be so, but using the Motion appliance to convert every case to a Class I posterior occlusion at the beginning of treatment makes it possible for every case to be treated with either brackets or aligners. We have solved the majority of complications that previously prevented treatment with aligners. Therefore, the patient has the choice of treatment.

Wouldn’t most patients more likely be drawn to aligners? Is there thus any point in offering brackets, besides perhaps lower cost?

The SLX 3D brackets come with a new wire sequence, the M-Series Wires with the innovative Wire Sequence. The sequence is designed to enable a simplified wire progression protocol, to reduce the number of wires used and finish cases in about 12 months in total, including the Motion stage.

After the Motion treatment, there are three options for the next step in treatment: the SLX 3D metal bracket, which is less expensive, the SLX 3D clear bracket or the SLX Clear Aligner System. We do not change more for aligners versus clear SLX 3D brackets, we don’t even do so when we start with the Motion appliance. The motivation for choosing brackets over aligners is that the new Carrière SLX 3D bracket together with the M-Wire Sequence makes the treatment very fast and efficient. Many patients choose brackets because the treatment is indeed so effective. It is just amazing how drastically you can cut the treatment time with an organised protocol and the appropriate tools.

If one uses the Motion system, do you still see a need for acceleration devices?

To me, one of the most interesting aspects of using the Motion appliance is that once you have succeeded in obtaining a Class I occlusion, there is a space between the incisors. So, when we use aligners, we can change the archwire every few days instead of every ten. It is therefore not really necessary to use acceleration devices. If we have a patient who is really in a hurry and wants to be treated to get results as fast as possible, then we use an accelerator, an alternative to switching aligners more often. Personally, unless we have such a patient, I don’t find it necessary to use acceleration devices, but it is nice to offer the patient all the possibilities and alternatives available.

Do you think many orthodontists use the Motion appliance or a similar system to correct malocclusion? As an example, there are 9,000 orthodontists in the US, over half of whom have used the Carrière Motion 3D appliance, totalling an actual market share of 46%. Today, Motion 3D is the leading Class II and Class III appliance.

What is the Happiness Revolution?

The Happiness Revolution views treatment as balancing the patient’s face, its beauty, pain related to a sore joint when it is not in the correct position, the patient’s airway for better breathing and of course the dentition. If you consider all of these aspects to find a balance when treating a patient, you will have not only a shorter, smoother treatment but a happy patient too.

What about airway and breathing problems? Are these related to certain classes of malocclusion? These problems require multidisciplinary treatment. An orthodontic treatment can be a solution for certain functional and skeletal obstruction problems, such as problems due to anatomical components or maxillo-mandibular relation, but other reasons—like the toxicity of the airway muscularis, far more serious and soft-tissue anatomical deformities—will also narrow the airway. Other medical specialists will have to act at those levels. Therefore, the orthodontist has to take care of the part he or she is responsible for and find the best solution to obstruction problems. I believe that the treatment of obstructed airway will soon be driven by multidisciplinary teams in which the orthodontist will have a very important role.

What motivates you to come up with new products? Maybe the knowledge of something that is lacking, your drive, a need to always challenge yourself?

I love orthodontics. I love to be able to find solutions to help improve the lives of patients or colleagues. I have some ability in identifying new concepts, and I have a passion for creating new things. I see a problem and think about it until I identify a possible solution. I try to think of solutions for common problems and not only in the orthodontic field. To me, it is enjoyable.

Do you have anything in preparation for a new Carrière revolution?

All the time, we always have something on the back burner. Innovation is at the core of Henry Schein, and we are committed to innovating as much as possible. What drives our innovations is the goal to simplify, to minimise the complexity of the orthodontic treatment and to try to obtain predictable treatment results. Our objective is to be successful in solving not only the dental problem we are trying to address but also related problems.

Thank you very much for the interview.
Widening the scope of aligner application: A case report

By Drs Gurkeerat Singh, Sherif Kandil & Aswathy Menon, India & Germany

Over the last two decades, extensive research has been carried out to alleviate the two major shortcomings of orthodontic treatment: visibility and duration.

In order to decrease treatment duration, three methods have been proposed: chemical-led interactions, surgery, and device-assisted therapies. The chemical-led interactions require further research to be accepted as routine methods and the surgical methods are found to be invasive and rarely acceptable to the patient. A simpler and less invasive method is the use of micro-osteoperforation, which increases the local inflammatory response, promotes osteoclastogenesis and leads to faster tooth movement through the bone. This process has been proven to be safe and repeatable and well tolerated and accepted by patients.

Deepbites are difficult to treat using aligners and often lead to prolonged treatment time. To facilitate this movement, Invisalign uses attachments on the premolars for anchorage, while an active intrusive force is placed on the incisors as well as bite ramps built into the lingual of the aligner of the upper anterior teeth that act as a bite plane, as yet no data exist on the effectiveness of these auxiliaries. Active intrusion can be facilitated with TADs.

Even though aligners might be the most aesthetic, hygienic, as well as acceptable treatment modalities available with the orthodontist, a decrease in treatment time is often desired by the adult patient. A case report is presented with the combined short-term use of bonded appliances, TADs combined with clear aligners from K Line Europe GmbH, Düsseldorf, Germany (K Clear) for an aesthetically conscious patient.

Case report
A 24-year-old male patient presented to the practice with a chief complaint of overlapping front teeth. As a

Fig. 1a-e

Even though aligners might be the most aesthetic, hygienic, as well as acceptable treatment modalities available with the orthodontist, a decrease in treatment time is often desired by the adult patient. A case report is presented with the combined short-term use of bonded appliances, TADs combined with clear aligners from K Line Europe GmbH, Düsseldorf, Germany (K Clear) for an aesthetically conscious patient.
model he wanted to avoid the use of bonded appliances. On examination, he presented with Class II features with the maxillary lateral incisors labially inclined and palatally inclined, supraerupted maxillary central incisors with a resultant 100% deep bite (Figs. 1a–h). He had an impacted mandibular incisor along with another incisor congenitally missing. The patient insisted on getting only the upper arch treated in the shortest time possible with an aesthetic appliance, as he had a modelling assignment starting in 4 months!

**Treatment procedure**

Keeping the patient’s professional commitments and the limitation of aligner therapy in mind it was decided to place a fixed bonded appliance for a short duration, along with TADS placed between the maxillary central and lateral incisors bilaterally for intrusion of anterior teeth (Figs. 2a–d). Force systems to achieve intrusion of the incisors to be in force from day 1 for a duration of 3–4 months (Figs. 3a–d) and subsequently to shift him to K Clear for residual bite opening, space closure and final finishing. Attachments on the maxillary first molar and premolars, bilaterally were provided to provide better retention to the aligners. The K Clear aligners were placed for 5 months (Figs. 4a–d). At the end of active treatment, retainer was bonded from canine to canine in upper arch (Figs. 5a & b). Additionally, the patient was provided an Esix retainer for night time wear. The patient is in retention for the past 1 year and the occlusion as well as other movements achieved are stable (Figs. 6a–d).
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Discussion
The presented case involves three major aspects of orthodontic treatment, from a patient’s perspective, aesthetics and duration of active treatment and, from a clinician’s perspective, the control of planned tooth movement. Any clinician who has had the opportunity to work with traditional pre-adjusted appliances as well as aligners understands the pros and cons of both appliance systems. It is this recognition of limitations that propels us as clinicians to seek better appliances in order to deliver treatment results in the best interest of our patients.

The aim of orthodontic therapy ought to include words such as ‘in the least amount of time’. It has been postulated by Nicozisis that aligners can be changed as frequently as 3–4 days when micro-osteoperforations are used along with aligner therapy to initiate the RAP phenomenon. The use of TADs not only provides the means of stable anchorage to apply forces from an ideal location avoiding any untoward movement, but also cause a local insult leading to an inflammatory response.

This case was started with a pre-adjusted bonded appliance along with the use of TADs placed close to the teeth requiring intrusion. When used in this manner, the flexible NiTi wires cause alignment and the vertical forces generated lead to intrusion and flaring of the incisor teeth. Since TADs also cause trauma, a RAP phenomenon is generated, which causes an increase in the rate of tooth movement.

The bite opening led to the increase in the upper incisor to NA from 12 degrees to 22 degrees (Figs. 7a & b). This led to minor spacing appearing between the anteriors. Clear aligners have been shown to provide good control where tipping movements are used and such controlled movements led to a near ideal finish for this case. The K Clear appliance was selected in this case based upon the variable thickness used to achieve different movements in a predictable manner and our experience with it.

A bonded retainer is a must for all adult cases. A 0.1750 coaxial wire was used for this purpose and bonded to all incisors individually. Retroclined incisors have a high tendency to relapse, especially when not supported by the mandibular incisors, hence the night time use of a K Clear retainer. The setting in this case was excellent and that sometimes is one of the pitfalls of treating cases with aligners.

Conclusion
An appliance that satisfies the aesthetic needs of the patient and also the orthodontic goals of the treating clinician in a short duration should be chosen to treat patients. Customisation is the new in thing in orthodontics.

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About the author
Dr Gurkeerat Singh
Proff. and Head, Sudha Rustagi College of Dental Sciences and Research Foundation
Haryana, India
drgurkeeratsingh@gmail.com

Dr Sherif Kandil
Orthodontic Consultant, K Line Europe GmbH
Dusseldorf, Germany
s.kandil@kline-europe.de

Dr Sherif Kandil
Orthodontic Consultant, Digital 32 Dental Solutions Pvt Ltd, Meikl bhandari, New Delhi-210076, India