Oral hygiene in orthodontics

By Curaprox UK Ltd

During orthodontic treatment, many patients seek advice on how to clean their braces effectively and gently. Since ordinary toothbrushes and interdental brushes are not suitable for orthodontic appliances, Curaprox UK is now offering the new Ortho Kit. This specialised kit contains the CS ortho ultra soft toothbrush, the CS 1009 single brush, the CPS 07, CPS 14 and CPS 18 interdental brushes, and ortho wax. The Ortho Kit is a perfectly combined set of products and gives dental professionals the best option for improving orthodontic patients’ oral hygiene.

When used correctly, the right toothbrush should dislodge and remove plaque through small circular movements along the gingival margin. Demonstrating the right balance between comfort and effectiveness, the CS ortho ultra soft toothbrush is specifically designed to clean both teeth and orthodontic appliances. With 5,460 filaments, the compact brush head allows for easy cleaning of the brackets’ outer surfaces and its shape helps patients brush at the right angle. Each filament has a diameter of 0.1 mm, allowing the production of a head with many fine, though durable, bristles. The groove in the middle of the brush head accommodates the brackets and wires to allow the brush to clean the teeth better. In addition, the octagonal handle facilitates brushing at an angle of 45°. The CS ortho ultra soft toothbrush cleans efficiently and thoroughly and has gained an outstanding reputation among orthodontic practices and patients.

Patients wearing orthodontic appliances have to exercise particular care in their oral hygiene, since bacteria can accumulate more easily around the brackets and wire surfaces. A single-tufted toothbrush, the CS 1009 is particularly suited for use on wires and brackets. The brush adapts to the contours of the brackets, can easily be moved from the top to the bottom, and is gentle on the gingivae. The CS 1009 also adapts to the anatomy of the gingival margin, making it an indispensable expert tool that every orthodontist should use.

How to use interdental brushes in orthodontic care

Interdental brushes allow for effective prevention of dental caries and periodontal disease and should ideally be used before, during and after orthodontic treatment. To maximise the potential foratraumatic, effective and acceptable cleaning without harm to the papillae, CURAPROX offers ultra fine bristles, extra thin wire cores and a durable system for all of its interdental brushing systems. Developed to suit the orthodontist’s needs, the CPS 07, CPS 14 and CPS 18 interdental brushes are especially capable of cleaning wires and brackets. With an accessibility of 2 mm and an effectiveness of 8 mm, the CPS 18 allows for excellent cleaning of the outer wires, whereas the CPS 14 is especially suitable for the inner wires. The CPS 07 allows for complete cleaning of the gaps between the teeth.

Our famous brand CURAPROX has placed special focus on the comfortable use of international brush holders for the specific needs of orthodontic patients. For example, the UHS 451 holder has a smart click system on which the CPS 07, CPS 14 and CPS 18 interdental brushes can easily be mounted. Patients can also use various other holders.

Another key element of the Ortho Kit, the ortho wax helps patients become used to their appliance and protects the oral mucosa from abrasion and injury by bracket edges. The transparent and tasteless wax can easily be placed on to the brackets once warmed and is available in a convenient carrying case. Finally, the Ortho Kit contains a brochure with tips and advice on how to clean teeth and appliances effectively. It provides specific oral hygiene instructions for each product, as well as information about proper nutrition.

Buy the Ortho Kit now at shop.curaprox.co.uk/professional
Insignia™ Resolves Adult Open Bite with Straight-Wire™ Finishing
Case Study

By Dr. David González Zamora, Spain

**Pretreatment Diagnosis**
Adult female, mesofacial, skeletal class I, open bite. Patient suffered from frequent headaches.

**Treatment Plan Objectives**
Close her open bite while maintaining vertical relationship of upper anterior incisors.

**Appliance Used:**
Insignia SL

Treatment plan notes submitted with this case:
- Insignia Archform
- Laterals should be shorter than centrals
- Align marginal ridges
- 3mm of overbite
- Expansion through molars and premolars
- IPR between premolars

**TREATMENT SEQUENCE**

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<th>Appointment</th>
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<th>Notes</th>
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<td>Determining occlusal labial 2.0.2.0.0 Occlusal adjustment</td>
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*Stock round wire*

**Treatment Discussion**
The patient had a complete open bite due to the habit of atypical swallowing. To perform a bite closure, it is necessary to achieve perfect alignment and leveling of the teeth as well as obtaining accurate torque. Only then can we face the upper and lower occlusal planes. In addition, the two arches have been expanded at premolars and molars. The key to making a bite close quickly and easily is applying forces mesial to the arcades center of resistance, just so get a rotation of both occlusal planes.

Despite using an extrusive mechanics with previous elastics, you can see in the photo finish smile that the relationship of the upper incisors has not worsened, thanks to the relative position of the brackets at the time of cementation. The patient also followed a rehabilitation treatment neuromuscular speech pathologist, to ensure the future stability of the case.

**Finishing Notes**
No debonds, no wire bends. Just occlusal adjustment.

**APPONITMENT 3**
2 WEEKS

**APPONITMENT 7**
57 WEEKS
"With 4-D printing we will be able to provide much more precise treatments"

Interview with Dr Sherif Kandil, experienced practitioner, CEO of K Line Europe GmbH

By Dr Sherif Kandil, Germany

We all heard about 3-D printing, what does 4-D stand for? Yes, that is true that we have been hearing lately only about 3-D printing, nowadays 4-D refers to additive manufacturing or printing of special materials that have certain memory characteristics built in a specific layering system on a 3-D printer, yet was designed or using CAD on a software that dictates the material reshaping and response to stimuli by time.

Can you tell us more about your recent activities in concern to 4-D technology? After I patented the idea of 4-D printing in orthodontics, I moved on to applying this technology in our R&D labs in K Line Europe in Düsseldorf, Germany. 4-D printing technology has been shifting engineers’ opinions and even many in the medical field on the possibilities and chances that have been unleashed after the introduction recently of this technology. I have been focusing on applying this science to clear aligners and also on orthodontic wires using advanced 3-D printers and re-engineered Meta materials.

Since I would consider myself as an experimenter, I am currently applying the 4-D printing concept of therapy on my own teeth to manufacture clear aligners, I am strictly recording all details as I will be publishing results in a scientific study after treatment completion.

How does 4-D change medicine in general and orthodontics in particular? I believe in the next few years 4-D printing will be changing many approaches we currently use to treat our patients. If you search online for 4-D you will find so many results and can even discover how medicine in particular will have the first and biggest impact with this technology. Bioengineers, for example, are trying to apply 4-D printing technology in replacing some tissue parts or even manufacturing implants and splints that are placed in our body. This could save many people’s lives due to the fact that the 4-D printed objects can change their shape inside the body to conform to what exactly needs to be replaced without the need for multiple surgeries.

In orthodontics, we will be able to provide patients a much more precise treatment that exactly meets their needs through customising the clear aligner or the orthodontic wire to change its shape when placed in the oral cavity to the requested final result. So it is crafting the final result with much more precision and with a smaller amount of clear aligners or wires so that only 1-2 aligners or 1-2 orthodontic wires are needed for the whole treatment.

What are the challenges that current clear aligners and fixed braces face in the market? Currently, I believe there are three main challenges we face in orthodontics when it comes to clear aligners or fixed orthodontics. First is the manufacturing process, as there are many steps when manufacturing clear aligners, thus rendering the final result less accurate, more expensive, more time consuming and more control required. Second is the complexity of applying the exact designed forces on the software for manufacturing the clear aligners, you might need accessories, more attachments on the teeth, etc. to overcome the limitations of clear aligners. Third, is the comfort of the patients as with clear aligners or braces patients need numerous amounts of aligners or wires to be changed throughout the treatment.

How will 4-D technology tackle these problems? 4-D technology promises to solve the aforementioned points and more. A short explanation of how this works is as follows: Teeth are normally 3-D scanned, then through the 3-D CAD software, aligners or orthodontic wires are made as a negative replica of the model stage representing the corresponding movement that shows where and how teeth need to be moved. The software allows you to put in joints and layers that allow contraction at one side and expansion on the other, and thus on the 3-D software we could stage all the aligner or wire shapes that will be self-morphed by the material.

The object (i.e. aligner or wire) is 3-D printed using special Meta materials that is responsive to the built-in software joints and layers. When the object is placed in the mouth there is a two most effective stimuli for the material to change its shape which is salivation (i.e. fluids) and 37 degree body temperature (i.e. heat).

So simply, the patient wears an aligner or wire on brackets that keeps changing its shape gradually to reach the final form through applying light continuous forces on teeth. Each aligner or orthodontic wire can be worn for over 5 months depending on the movements that were programmed on the software from the initial planning stage.

How would you describe the advantages that will be implemented in orthodontics using the 4-D concept? The advantages are quite clear, as patients will enjoy a more friendly treatment where they don’t have to visit their orthodontist as regularly as they used to as this coincides with the recent approaches of distant treatments applied in orthodontics nowadays. Also many treatments won’t need the refinements as they did before, such as the clear aligner treatments, which has had negative experiences. Most of all, the precision of force application and distribution is way more precise as with the software, the exact force, amount and time will be controlled. Furthermore, the aligner thickness can be altered depending on the need and can be controlled throughout the whole treatment to keep the force and anchorage distribution absolutely stable and avoid the variability that we experienced with previous clear aligner systems.

When do you think this technology will be available on the market? We hope we can bring this technology into clinical use very soon, yet a rational expectation would be to expect it to enter the market in 2019 and change many applied current treatment concepts in orthodontics.

Technology is shifting really quickly these days, how do you see it evolving in the next few years in orthodontics? I see 4-D printing and augmented reality to be one of the game changers in medicine in the upcoming years.

How could we get more information and even follow up this upcoming high technology? Currently, the internet contains many approaches in 4-D tech, yet for orthodontic application you could follow up more on the following webpage www.kline-europe.de/adorth. Thank you for the valuable input and we hope to hear even more about the new inventions soon.

Thank you for this opportunity and I hope that this advanced technology can bring more welfare to our patients.
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