C-Fast simple lingual orthodontics for the GDP

Mark Skimming looks at some simple, non-invasive orthodontic treatments

With the growing trend of adults looking for cosmetic dental procedures, the demand for various types of simple orthodontic treatments is rapidly increasing.

It must be highlighted that although specialist orthodontists set the standard of the best treatment outcomes, many of these cases can be treated by appropriately trained general dentists achieving an ideal outcome or limited treatment outcome when a patient has rejected a comprehensive plan.

The recently set up European Society for Aesthetic Orthodontics (ESAO.co.uk) provides an excellent platform for independent training and an advice forum as well as clearly defined protocols for assessing and planning treatment cases. For those clinicians who are comfortable with planning, mechanical theories and treating cases of labial orthodontics, a logical next step is to complete training in alternative appliances. Training and mentoring for simple lingual can be provided in house or by attending a scheduled course by contacting the C-Fast office.

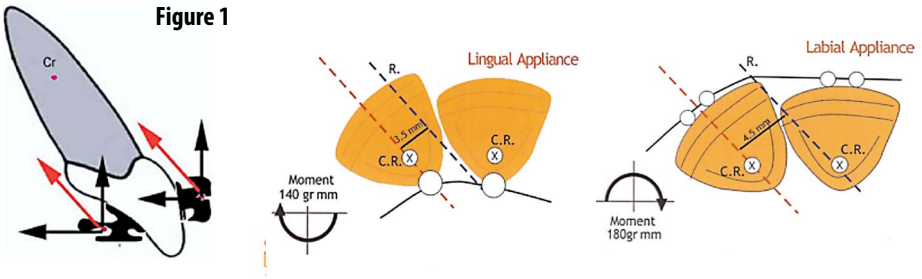
Definition of cosmetically focused orthodontics

'Orthodontic treatment that focuses on the cosmetic improvement of teeth in the aesthetic zone, has no detrimental effect on the occlusion and can be completed in a time-frame significantly shorter than comprehensive orthodontics.' – Dr Biju Krishnan BDS (founder of C-Fast) and David Winkler (president of the IFED).

Simple lingual orthodontics

Simple lingual orthodontics from C-Fast provides a discreet system whereby straightforward cases can be completed without the need for visible brackets.

Figure 1



Like labial cosmetically focused orthodontics, case selection is the key and allows clinicians to inform patients of any limitations of treatment.

The simple lingual system allows us to complete movement of teeth in the UR2-UL2 region, where patients who would traditionally reject any visible orthodontic appliance and request invasive procedures including veneers and crowns.

Treatment is carried out using round nickel titanium, titanium molybdenum alloy (TMA) wires (root torque is not achieved and therefore no reduction in overjet through this type of treatment) and low profile self-ligating brackets, which create a consistent tension on the teeth.

Cases are typically completed in six-16 weeks for alignment and a few more weeks to complete any further bleaching and bonding.

Differences in mechanics of lingual orthodontics

There are some basic differences in the mechanical forces the wire applies onto the bracket/teeth, however the centre of rotation remains the same as labial treatment. This provides the same tipping movement in a bucco-lingual direction with round wire that is achieved with labial brackets and round wire (Figure 1).

With the simple lingual treatment, the inter-bracket distance is shorter (Figure 2) resulting in the same wire acting stiffer than in labial orthodontics. This in turn makes the wire more difficult to engage, particularly in cases of moderate-severe crowding as well as any severe rotations.

A tip when placing the wire into the brackets is to stabilise the wire onto the canines and closing the self-ligating mechanism. The most rotated tooth should be ligated next. Due to the stiffer action of wires onto the brackets, difficulty in engaging the wire as well as the lower forces required to achieve the most efficient movement case should generally start with a 0.12" nickel titanium wire for best results.

As with any treatment the main difficulties listed below should be discussed with the patient for valid consent. Consent forms are available from all companies providing orthodontic appliances and support as well as from the ESAO. However, some specific issues patients may experience should be highlighted prior to commencement of treatment to ensure patients will be completely happy to complete treatment.

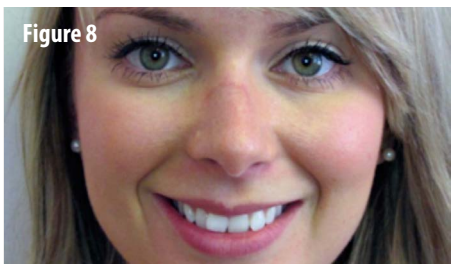
Problems with lingual orthodontics – patient's perspective

- Oral hygiene and gingival irritation – due to the difficulty with manual brushes in accessing and mechanically cleaning the space between the cervical portion of the bracket and gingival margin, use of ▶

Figure 3: Upper appliance – note the distal bends on the wire to prevent sliding of the wire and irritation to the patients tongue

Figures 4 and 5: Case one – good anterior alignment of UL2-UR2 after 12 weeks, but canines clearly moved bucally (rounded out)

Figure 6: Brackets bonded to UL4s-UR4s and TMA wire fitted to correct canine position in a few weeks



Figures 7-10: Case two – typical straightforward case suitable for simple lingual ortho. Treatment completed in 12 weeks

an electric toothbrush is recommended
- Speech adaptation – rarely an issue, however all patients should be informed of this as some are very sensitive to any affect on their work/personal life
- Tongue irritation – rarely an issue, but may be problematic in patients with a tongue thrust or habitually rubbing brackets with their tongue
- Bite opening to disclude the anterior teeth from interfering with the bracket (resulting in intrusion and post treatment posterior open bite) – patients will regularly report difficulty eating or possibly some tenderness of masseter in the early stages. This is generally self-limiting and the patient quickly accommodates these contacts
- Cost is normally increased due to higher cost low profile brackets – this may be offset by the reduced treatment time when comparing to labial treatment.

Appropriate case selection and planning is key to successful treatment in all cosmetically focused orthodontic cases. Take the stress out of treatment and keep it simple.

Most of the cases presenting at Dentistry on the Square require minor movement due to relapse of orthodontic treatment as a child and therefore buccal segments tend to be in a favourable position.

Case selection

Ideal case selection:
- Class I molars and canines – with canines in a good position
- Mild crowding anterior segment only UL2-UR2
- Mild rotations and axial inclination
- Mild spacing anterior region – the wire is visible through any spacing possibly making the benefit of hidden brackets redundant
- Good mandibular opening – an absolute requirement due to the difficulty in accessing the brackets.

Cases to avoid:
- Limitation in opening
- Moderate to severe crowding
- Midline shifts – this requires comprehensive treatment
- Excessive spacing
- Unresolved periodontally involved patients
- Crossbites involving multiple teeth.

Be cautious with:
- Root treated teeth – check quality of root filling and consent patients appropriately
- Extrusions/intrusion of teeth
- Crossbites
- Rotated teeth.

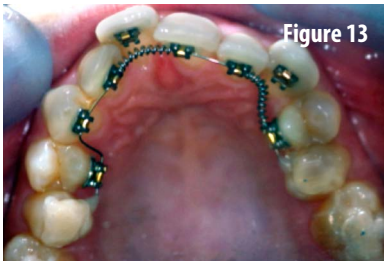
Remember:
- Not to replace comprehensive orthodontics – be aware of operator training and appliance limitations
- If the main problem is a malocclusion or patient request is beyond the scope of cosmetically focused orthodontics – refer!

Treatment protocols

Cases can be treated using only two or three wires (nickel titanium and TMA). Any space requirement can be achieved through inter-proximal reduction (IPR) as well as any rounding out in the UL2-UR2 segment.

All cases start with a 0.012" nickel titanium wire with around 40% of cases finishing with the same wire. If further movement, to gain the desired result, is required then the 0.016" nickel titanium wire can be ▶

Figures 11-18: Case three – advanced case – difficult case for simple lingual treatment due to minor canine movement required to recreate canine guidance. Premolars bonded from start to provide anchorage for canine movement. This case would be very easily treated with labial treatment but the patient did not find it acceptable



selected next.

Once the final alignment of the UL2-UR2 segment is completed with this wire, the next step is to assess the position of the canines.

In some cases unwanted buccal movement (rounding out) of the canines will occur, potentially unfavourably affecting lateral guidance. Brackets can then be placed on the first premolar position and a pre bent (by the lab) 0.016" TMA wire place to return the canines to their original position.

If no rounding out occurs (typically in most minor cases completed in 12 weeks) then proceeding to debonding and placing retainers can be completed.

Tip – some clinicians may complete fixed orthodontic treatment with final finishing and detailing carried out with a single clear aligner. This allows earlier removal of brackets and patients to start their whitening treatment, which can be beneficial to patients looking to finish on a tight time frame.

Steps for treatment

- Good impressions are sent to the laboratory showing full labial and lingual surfaces of the teeth to be bonded
- Laboratory sets up case so that brackets are bonded UL3-UR3
- Laboratory sends two wires initially – 0.012" nickel titanium and 0.016" nickel titanium
- If rounding out of the canines occurs an impression is taken (with the wire out) and the lab returns a setup to bond brackets onto the first premolars as well as the 0.016"TMA wire.

Bonding components required

- Optragarte or nola dry field
- Air abrasion or polish of lingual surface
- Etch/primer/composite
- Brackets.

Bite raisers

- Placed when using upper arch simple lingual appliance or crossbite present
- Small amount placed onto occlusal surface of all occluding teeth to create equal contacts
- Prevents occlusal contact onto brackets and reduces risk of debond – this will result in intrusion of posterior teeth and posterior open bite at end of treatment. Hybrid retainers allow any intruded teeth to return to their original position with the benefit of retaining the UL3-UR3 position and completion of whitening.

Finishing cases with lab made retainers

Visit one:

- Impressions without arch wire
- Lab prescription for removable retainer
- Replace arch wire.

Visit two:

- Remove fixed appliance
- Polish teeth
- Fit removable retainer
- Finishing, photos and start whitening.

Visit three:

- Impressions for fixed appliance (after any bonding).

Visit four:

- Fit fixed retainer(s)
- Impressions for new removable retainer (possibly hybrid retainer). ■

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