

# Aesthetic movement

Nadeem Younis studies the orthodontic/restorative interface in the aesthetic zone

For a smile to be aesthetically pleasing, the teeth should not only be in harmony with each other but they should also be in harmony with the face. The macro-aesthetics should be in harmony with the micro-aesthetics to give a pleasing smile.

Intra-orally, the teeth should be well aligned and the gingival zeniths of the centrals and the canines should be at the same level with the gingival zeniths of the laterals being 1.0mm incisal to a line drawn from the zeniths of the central incisor and the canine.<sup>1,2</sup>

A number of techniques have been suggested to deal with instanding lateral incisors from a prosthodontic point of view:

- Placing a crown over the lateral incisor with an increased bulk of porcelain labially to bring the tooth in line with the arch. This approach requires minimal labial tooth preparation but heavy preparation on the palatal surface. In moderately/severe displaced teeth a root canal treatment followed by a post crown is usually required.

- Extraction of the lateral incisor if severely displaced and provision of an implant to replace the missing lateral incisor/s provided there is adequate width mesiodistally.

- Extraction of the lateral incisor and fabricating a two or three unit bridge to replace the lateral incisor.

The above approaches are prosthodontically driven and destructive. Orthodontists have been treating displaced anterior teeth with fixed appliances by creating space if required by extraction of premolar units. Orthodontically driven approach works well if the lateral incisors are unrestored, but how would you manage a patient with an instanding lateral incisor/s who has had a bulky crown to bring



## Education aims and objectives

The aim of this article is to outline how to achieve a pleasing aesthetic outcome with minimal destruction to the existing dentition

## Expected outcomes

The reader will understand the importance of an interdisciplinary approach with strong communication between the restorative dentist, orthodontist and ceramist, through a case study that used a combination of orthodontics and prosthodontics to harmonise the teeth



Figure 1: Pre-op labial view

the tooth in line of the arch?

In order to provide a pleasing aesthetic outcome with little destruction to the existing dentition, an interdisciplinary approach is required with good communication between the restorative dentist, orthodontist and the ceramist. The following is a case study of a patient who wanted to enhance her smile. A combination of orthodontics and prosthodontics was used to harmonise the teeth in the aesthetic zone.

## Initial presentation

The patient presented to my clinic unhappy with the appearance of her upper right lateral incisor (UR2). On closer examination, the UR2 had a post crown placed by a previous dentist who tried to align an instanding lateral incisor by prosthetic means only (Figures 1-5)

## Problem list

The following problems were also identified:

- Diminutive right lateral incisor crown
- Uneven gingival zeniths of the upper anterior teeth
- Submerged second deciduous molar on the left hand side



Figure 2: Pre-op right side – unaesthetic crown UR2



Figure 3: Pre-op left side – submerged deciduous tooth

- Missing lower left first molar (stable occlusion)
- A wide incisal table on the UR2 crown.

## Radiographic examination

The OPT confirmed the presence of a post crown on the UR2 and the submerged deciduous second upper molar. There was also molar stacking in the upper left second and third molar region.

The lateral cephalograph revealed average inclination of the upper and lower incisors on a mild skeletal class III base on an increased lower face height (increased FM angle) (Figures 6-7).

## Treatment objectives

The objective of the treatment was to align the upper anterior teeth and, by bringing the UR2 in its correct position, to harmonise the gingival aesthetics.

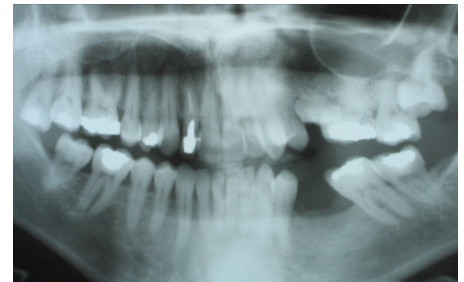
Dr Nadeem Younis qualified at Sheffield in 1993 and has a special interest in orthodontics and aesthetic dentistry. He runs hands-on composite courses for general dental practitioners and accepts case referrals. He is also a full member of the British Academy of Aesthetic Dentistry and a partner in Bridge Dental Practice, Burnley.



**Figure 4:** Occlusal view – palatally placed UR2 restored with post crown



**Figure 5:** Occlusal view lower arch



**Figure 6:** Pre-op OPT



**Figure 7:** Pre-op lateral ceph



**Figure 8:** Open coil spring to open space for UR2



**Figure 9:** UL2, tooth to be copied



**Figure 10:** Bend placed in archwire to prevent labial movement of anterior teeth



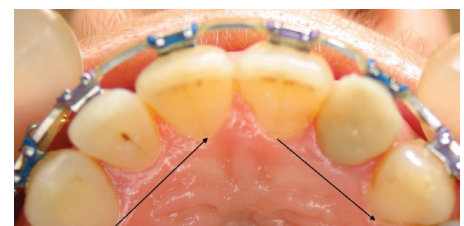
**Figure 11:** Occlusal view after space creation UR2



**Figure 12:** Islet and elastic string attached to archwire (from a different case)



**Figure 13:** 19x25 posted stainless steel and closing niti springs on LHS



**Figure 14:** UR2 mimicking position of UL2 palatally

## Treatment plan

The treatment plan was as follows:

1. Extract the submerged upper left deciduous second molar.
2. Move the centre line to the left by a couple of millimetres.
3. Align the upper right lateral incisor clinical crown and torque the root to its correct position with fixed appliances.
4. Close the extraction site space.
5. Ensure the gingival zeniths of the upper anterior teeth are in correct proportions.

6. Place a definitive crown on the UR2.

## Treatment sequence

### 1. Space creation in the anterior zone

The patient was happy with the arrangement of her teeth on the left hand side so we decided to replicate this arrangement on the contralateral side. In order to replicate this arrangement, firstly we need to remove the old crown, reassess the angulation of the underlying tooth and place a temporary crown (Luxatemp). Secondly, we need to provide adequate width

so that the widths of the lateral incisors are the same. The space available on the right hand side is 5.5mm, whereas the width of the upper left lateral incisor is 7.0mm. The space is created by using an open coil spring (OCS) on a round stainless steel (0.016) archwire so that there is a centreline shift of approximately 1.5mm to the left, making use of the extraction site. Kokich<sup>3</sup> in his study showed that general dentists and lay people were unable to detect a midline deviation of up to 4.0mm (Figures 8-9).



Figure 15: Labial view UR2



Figure 16: Labial view UL2



Figure 17: Post-op after ortho treatment labial view



Figure 18: Post-op RHS



Figure 19: Post-op LHS



Figure 20: Labial view 312 retention

In order to ensure that the teeth move along the archwire and that we do not procline the upper labial segment, bends are placed in the archwire distal to the speed tubes on the upper molars on both sides (Figure 10).

## 2. Labial movement of the upper right lateral incisor

The next phase of the treatment is to procline the UR2 (Figure 11). This is done by trimming the labial surface of the temporary crown, leaving only a thickness of approximately 1.5mm of acrylic labially for the fabrication of the definitive crown. A bracket is placed on the lateral incisor, rotated through 180 degrees, which allows for the extra root torque. A flexible archwire is then engaged to procline the lateral incisor in line of the arch. If the tooth is severely displaced palatally, then an islet can be attached to the tooth and an elastic thread can be used under tension to align the tooth sufficiently before a bracket can be placed as aforementioned (Figure 12).

## 3. Alignment and space closure

As the tooth is aligned in the arch, the sequence of the archwires is built up to a rectangular stainless steel (0.019 x 0.025) to express the prescription in the bracket fully. Space closure is initialised to close the extraction site space on the left hand side with nitinol springs (Figure 13).

A reference line was used to copy the arrangement of the upper left anterior teeth to the arrangement of the teeth on the contralateral side. The most palatal point of the UL2 is 2.0mm labial to a line drawn connecting the

most palatal points of the central incisor and the canine. The same arrangement was copied on the right hand side (Figure 14).

## 4. Correction of gingival discrepancy

Figures 15 and 16 show the arrangement of the lateral incisors towards the end of the treatment. The gingival zenith of the upper right lateral incisor is slightly lower when compared to the gingival zenith of the upper left lateral incisor. This discrepancy can be corrected either by intrusion of the tooth or by crown lengthening. A periapical radiograph was taken to verify the position of the crestal bone. It was decided to perform a gingivectomy at the debond appointment as there was sufficient gingiva to enable us to correct the gingival asymmetry without violating the biological width.<sup>4</sup>

## 5. Completion of active orthodontic treatment

Figures 17-19 illustrate the teeth via study models on completion of the active orthodontic treatment. The upper anterior teeth are well aligned with the gingival zeniths closer to the ideal. On the right hand side the canine and the first molar are maintained in a class I relationship, whereas on the left hand side the canine is maintained in a class I occlusion with complete space closure of the extraction site.

A new temporary crown was fabricated following gingivectomy with electrosurgery<sup>5</sup> for the upper right lateral incisor and an upper Trutane retainer was fitted which the patient wore at night time.

## 6. Prosthetic rehabilitation

The patient was reviewed after three months



Figure 21: Palatal view 312 retention



Figure 22: Labial view of prep UR2



Figure 23: Palatal view of prep

to allow for maturation of the gingiva on the upper right lateral incisor (Figures 20-21). The soft tissue healing is satisfactory with no relapse of the UR2. The temporary crown was removed and following the refinement of the preparation a definitive impression was taken for the



Figure 24: Colour photograph to communicate hue and chroma



Figure 25: Black and white photograph to communicate value



Figure 26: Photo of UL2 to communicate texture and characterisations



Figure 27: Final outcome PFM UR2

fabrication of the definitive crown (Figures 22-23).

In order to produce a lifelike restoration, additional information was relayed to the ceramist in terms of a coloured photograph with different shade tabs to communicate the hue and chroma, a black and white photograph with different shade tabs to communicate the value, and a close-up photograph of the contralateral incisor to communicate the surface texture and characterisations (Figures 24-26).<sup>6</sup>

A porcelain fused-to-metal crown (PFM) was fabricated, ensuring adequate length incisally to maintain a positive overbite for the upper right lateral incisor to prevent relapse (Figure 27). Retention was continued by wearing an upper Trutane retainer for a period of 12 months.

## Conclusion

The patient was delighted with the outcome. Although the case looked simple at the outset,

it was a challenging case in that it needed complex orthodontic treatment and good communication with the ceramist to achieve an aesthetically pleasing outcome with minimal damage to the existing anterior teeth.

## Acknowledgments

I would like to thank my ceramist, Steve Taylor, for his beautiful ceramic work.

Care to comment? @AesDenToday

## Summary of products used

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