Treatment of a Complete Class II Malocclusion with Extraction of First Premolars and Maximum Anchorage using Microimplants

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This article will describe the treatment of a complete class II malocclusion in an adult patient with severe anterior overcrowding treated with lingual technique (Incognito™ bracket system) and microimplants to provide maximum anchorage on the upper dental arch.

DIAGNOSIS

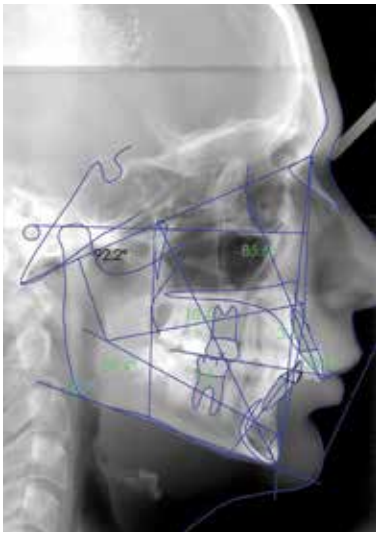
A male patient aged 24 years. He first came to the clinic because his teeth 'stuck out' and were crowded. Clinical examination found dental and skeletal class II, with moderate mandibular retrusion, severe overbite, overjet and moderate anterior overcrowding in both arches.

Panoramic X-rays revealed the devitalization of tooth 26, erupted upper third molars and impacted lower third molars.

Cephalometric analysis confirmed that this was a skeletal class II division I, brachyfacial with a facial axis of 93º, a low mandibular plane angle (17.5º) and an acute interincisal angle (121.8º). The maxilla was slightly protruded and the mandible retruded.

Aesthetic analysis of the face showed a moderately short lower third, with correct nasolabial angle and pronounced labiomental angle. In general, there was a slight protrusion of the upper lip and mandibular retrusion.

Series 1



TREATMENT ALTERNATIVES

Because of the facial and cephalometric characteristics of the case, the surgical option was assessed, with a view to mandibular advancement which would permit sagittal correction of the malocclusion and improvement to the facial parameters.

As the patient had refused surgery, a second treatment option was proposed that would camouflage the malocclusion using orthodontic treatment with the extraction of upper first premolars but no extractions in the lower arch. This aimed to minimize changes to the profile.

The treatment objectives also included alignment, levelling, correction of the overbite and the overjet. This would achieve a canine class I, maintaining the molar class II. Treatment would require maximum anchorage, as the case presented a complete class II, which was to be treated using the lingual technique.

TREATMENT HISTORY

Treatment began with indirect lingual bracket bonding. An edgewise wire was placed in the upper arch and a ribbonwise VH on the lower.

Series 2

Series 3

Series 4

On the upper arch a 3-3 Bite plane was ordered to facilitate correction of the overbite and avoid interference with the brackets in occlusion. A round 0.016" Nitinol archwire was placed on both arches for alignment and levelling.

After six weeks these wires were replaced by 0.016"x0.022" Nitinols to terminate the first phase of treatment.

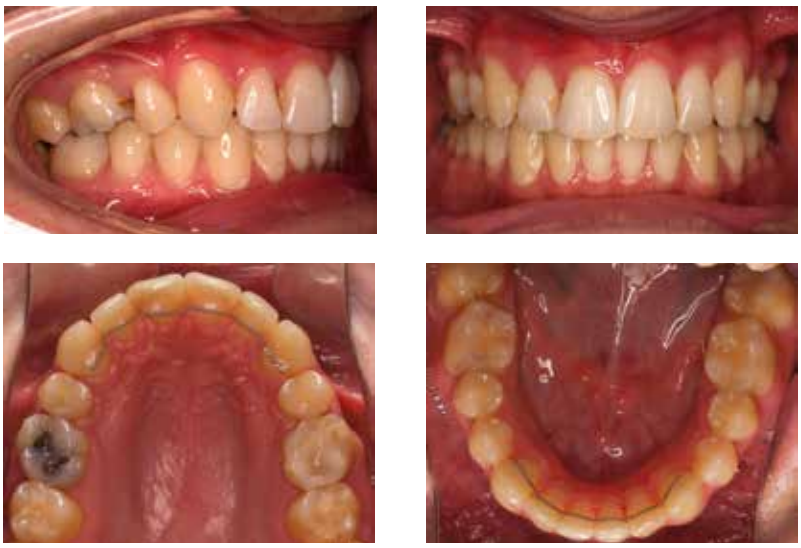
At the three month mark, 0.016"x0.022" stainless steel wires were fitted on both arches, with 15º extra torque on the upper incisors to compensate for the tendency for loss of torque when the anterior teeth are retruded.

At the next appointment, vestibular microimplants were placed between the upper second premolars and first molars. Acrylic buttons were bonded on the vestibular faces of the canines and immediate traction was performed using vestibular and lingual closure chains, splinting in advance from canine to canine on the palatine aspect. This was to bring about a mass retraction for space closure, maintaining posterior sectors in position and avoiding mesialization. This created the need for maximum anchorage with microimplants.

A slight interproximal reduction was made to the upper incisors in order to align without protruding and facilitate the coordination between the arches as the patient presented proportionally smaller upper lateral incisors. It is important to pay due attention to space closure and mass retraction to avoid unaesthetic spaces from opening between the canines and lateral incisors.

To achieve final extraction space closure it is essential in the final phase to splint the second premolars and canines with a chain (with the same links) on the palatine aspect.

As soon as the spaces were closed, treatment was finalized



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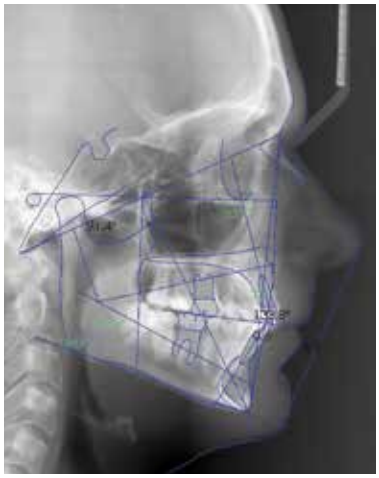

with a 17.5” x 17.5” TMA wire on the lower arch and an 18.2” x 18.2” on the upper, filling the bracket slots 100% for maximum bracket information (especially torque) with the aim of achieving the exact result foreseen in set-up models.

CONCLUSION

The use of microimplants as anchorage simplified the biomechanics involved in the treatment of this case obtaining satisfactory final outcomes. This facilitates the application of force vectors which would otherwise be impossible. It also allows the clinician to realize the desired skeletal or dentoalveolar changes, avoiding undesirable collateral secondary effects.