

UTILIZZIAMO I CLINICAL TIPS PER COMPLETARE ED ESSERE PIÙ BREVI

- 1) Rationality of Bidimensional Technique (Jack. Bednar)
- 2) Bidimensional treatment in non-extraction cases. (Giovanna Maino)
- 3) Bidimensional anchorage control in extraction cases (Oswald Richter – Franco Giancotti)
- 4) **Non-compliance orthodontic treatment in Bidimensional Technique (Giuliano Maino – Paolo Pagin)**
- 5) Bidimensional Technique with self ligating brackets (Mauro Cozzani – Aldo Giancotti)
- 6) Bidimensional control in asymmetric space closure (Silvia Allegrini – Aldo Giancotti)
- 7) **The control of vertical dimension in Bidimensional technique (Giuliano Maino-Pagin)**
- 8) Bidimensional approach of stability of orthodontic treatment (Sandro Cocciani)

LEGENDA:

 = testo eliminato

 = testo aggiunto

TITOLO

**Non-compliance Class II treatment in Bidimensional Technique
(B. Giuliano Maino – Paolo Pagin- Giovanna Maino)**

Le aspettative del paziente ortodontico sono generalmente di natura estetica e in secondo luogo funzionali possibilmente mantenendo una dentizione integra, senza ricorrere quindi alla estrazione di denti permanenti.

A questo si aggiunge la disponibilità di una collaborazione ridotta al minimo , con una durata del trattamento più contenuta possibile.

Quindi nell'ottica di un ortodonzia orientata verso il paziente e che cerchi di [soddisfarne le aspettative](#) senza compromessi sul piano qualitativo, il ricorso agli ancoraggi scheletrici (TAD's) costituisce una valida risorsa perchè consente:

Un trattamento in assenza di collaborazione

La certezza dei tempi e talvolta la loro riduzione

La prevedibilità del risultato

La possibilità di correggere malocclusioni difficili o addirittura impossibili da trattare con l'ortodonzia convenzionale

I TADs si possono classificare in Impianti Palatali, Plates e miniviti.

Quest'ultime sono le più usate per la loro facilità di applicazione e per l'immediatezza del loro utilizzo.

Per questo motivo nella nostra metodica è previsto l'utilizzo di TADs sotto forma di miniviti [che vengono applicate direttamente dall'ortodontista nel momento più opportuno.](#)

Il trattamento delle malocclusioni di classe II generalmente viene effettuato sia con estrazioni che senza estrazioni.

Class II without extraction

Le indicazioni al trattamento senza estrazioni sono:

Il morso profondo

La tipologia scheletrica ipo/normodivergente

L'assenza di affollamento in arcata inferiore

L'assenza di una biprotrusione

Infine, la agenesia dei terzi molari superiori che, nel caso di una strategia estrattiva di due premolari superiori, porterebbe alla esclusione funzionale della parte distale dei secondi molari inferiori (Fig.1).

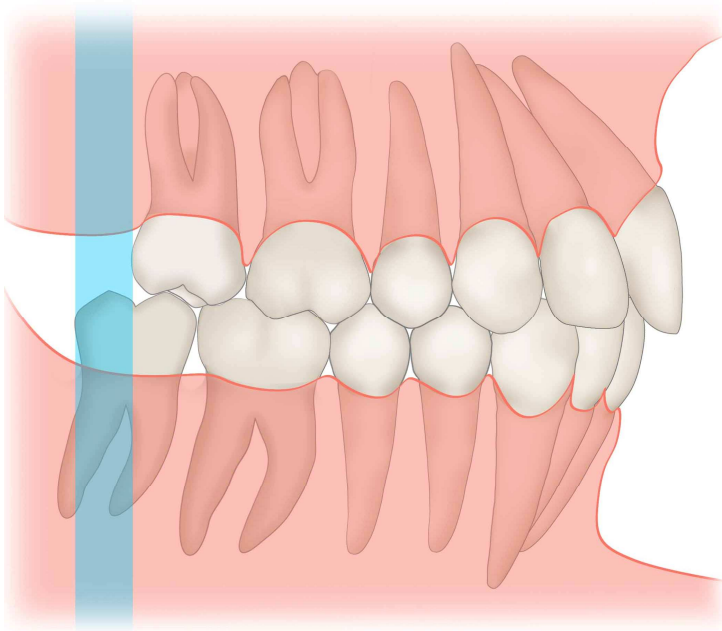


Fig. 1: Occlusal relationship of a case with extraction of one premolar in the upper arch. Notice that the distal part of the lower second molar is out of occlusion in case of upper third molar missing

Quando l'ortodontista deve optare per una strategia non estrattiva, due dei maggiori ostacoli che si trova ad affrontare sono la stretta dipendenza dalla collaborazione del paziente e la maggior lunghezza del trattamento ortodontico.

In questo articolo descriveremo un protocollo per il trattamento delle II Classi senza collaborazione che permette di soddisfare con prevedibilità le richieste estetiche e

funzionali del paziente con tempi certi e in alcuni casi ridotti rispetto al trattamento convenzionale.

In agreement with the philosophy of the Bidimensional Technique, we subdivide the treatment of Class II malocclusions into three well-defined phases, with the aim of allowing [an](#) immediate monitoring of the cases at each stage of the therapy ¹.

In this way the orthodontist will be able to control the complexity of the treatment step by step using the lower arch as the reference guide.

The three treatment phases are:

Phase 1: Distalization of the upper molars to reach “Super Class I” relationship;

Phase 2: Distalization of the premolars and canines;

Phase 3: Retraction of the incisor group.

This strategy give us the possibility to monitor the achievement of Class I by the molars first and then by the lateral segments allowing minimal incidence of error, as it is more simple to recognize any unforeseen problems during the therapy.

FASE I: molars distalization

Il sistema da noi utilizzato (MGBM System)² prevede una parte passiva di ancoraggio e una parte attiva distalizzante .

The anchorage system (passive component) comprises two miniscrews (Spider Screws K1; length 10 mm; diameter, 1.5 mm; HDC, Sarcedo, Italy) connected to a transpalatal bar.

The miniscrews are applied to the palatal side between the second premolar and the first molar because usually the distance between the roots [of these teeth](#) is relatively larger in

this place due to the fact that the first molars has only one palatal root ³. Eventually the miniscrew can be applied between the first and second premolars in presence of a wide interproximal space . This allows the second premolars to move distally following the movement of the first molar due to the traction of the interseptal fibers. The insertion of the miniscrew is performed about 30° to 40° with respect to the inclination of the palatal vault.

The transpalatal bar (stainless steel, 0.036 inch) is bonded onto the occlusal surface of the first upper premolars and then connected to the miniscrews through a well tightened SS metal ligature 0.014 inch . (Fig. 2).

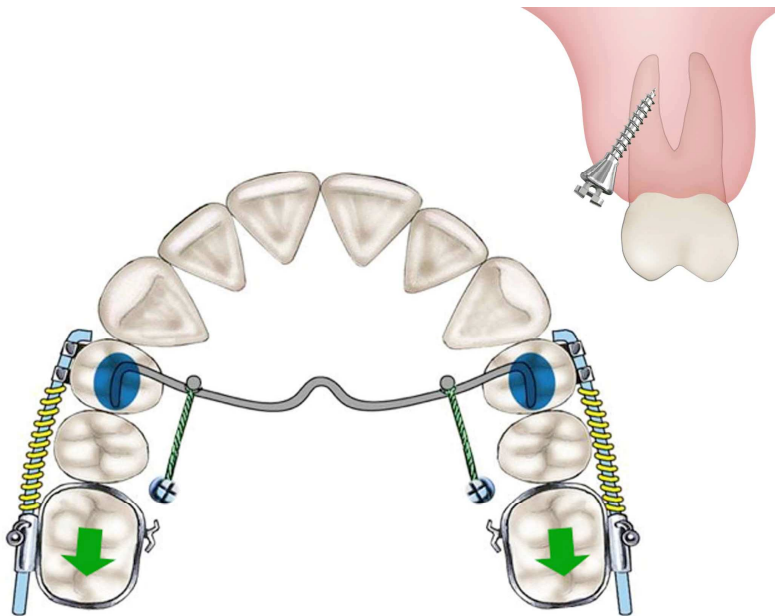


Fig. 2: The MGBM System. The miniscrews are inserted on the palatal side with an inclination of 30°- 40° respect to the palatal vault

In this way, the bar prevents loss of anchorage and possible unwanted rotation, inclination and torsion effects on the premolars.

The distalizing system (active component) comprises a sectional wire 0.016 × 0.022 inch SS and an open NiTi coil (200 g) from the first premolars to the first molar on each side.

The open NiTi coil is 10 mm longer than the space between the distal part of the bracket of

the first premolar and the mesial part of the molar tube. When the coil is compressed between the first premolar and the first molar, it is activated by 10 mm.

The second premolar is not bonded, to facilitate the application of the coil.

If the second molar has also erupted, in addition to the distalizing component applied to the first molar a second component to distalize the second molar is added obtaining a Simultaneous Upper Molars Distalizing System (SUMODIS).

Before ligating the sectional wire 0.016 × 0.022 inch SS to the bracket of the first premolar, a double tube is selected. The lower component of the double tube is inserted in the sectional wire and thus blocked against the first premolar bracket by mean of the precompressed NiTi coil.

A tube is attached to the second molar with a distogingival inclination (Fig 3) .

A NiTi 0.018 × 0.025 inch sectional wire (200gr of force) in excess of length, on which a mesial and a distal stop are crimped is inserted into the tube of the second molar and into the upper part of the double tube. (Fig. 3)

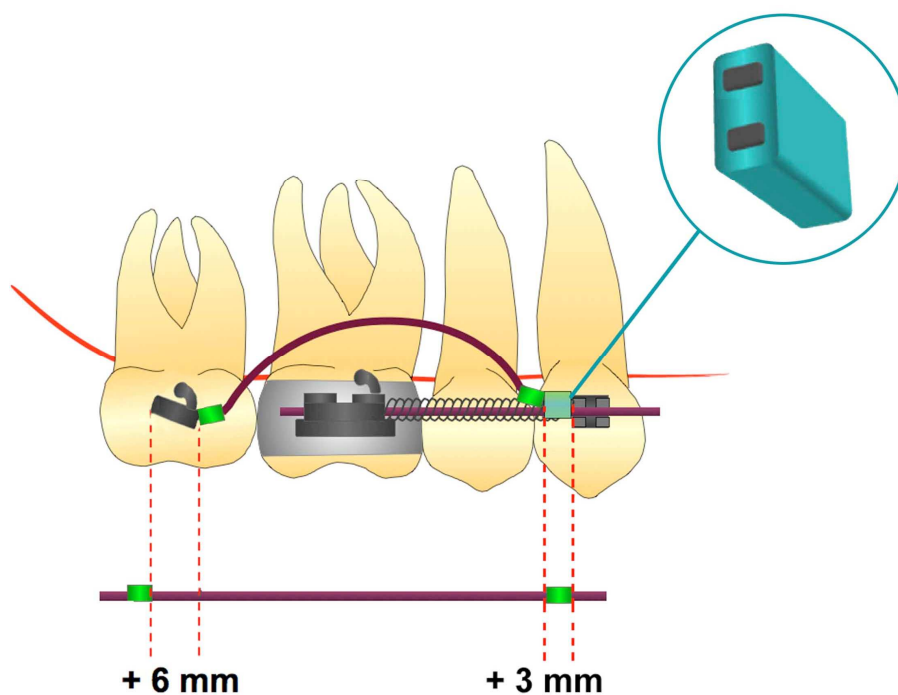


Fig 3. The MGBM System with SUMODIS (Simultaneous Upper Molars Distalization System)

The NiTi wire, due to its excess of length, is automatically activated by 9 mm thus leading to the second molar distalization while the compressed coil will distalize the first molar.

The distogingival inclination of the tube of the second molar is critical in order to minimize the distal crown tipping of the second molar due to the use of a non rigid NiTi wire.

CLINICAL TIPS FOR PHASE 1

The tube on the second molars should be placed with a distogingival inclination in order to compensate the crown-distal tipping effect from the use of a superelastic NiTi sectional wire.

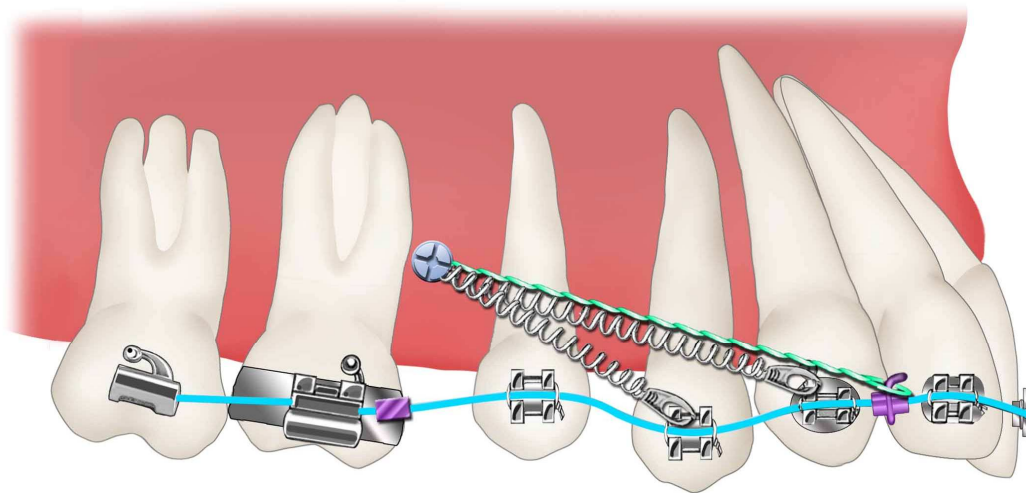
- The complete alignment of the second molar will be reached after bonding the entire upper arch
- The excess of length of the NiTi sectional wire used for SUMODIS must be proportioned also to the patient vestibulum depth in order to prevent any discomfort.
- The brackets on the first premolars should be attached in a way that a straight sectional wire .016x.022 can be inserted between the first molar and the first bicuspid without making bends.
- If one side has completed the distalization (super class I molar relationship) and the other not, keep the system active in the side that must work.
- Secondly, in the super class I molar relationship side a segmental wire can be placed from the first premolar to the second molar and a piece of closed coil from the first molar to the first premolar can be used as space maintainer in place of the compressed NiTi coil.

Phase 2: Retraction of the premolars and canines

Once a Super Class I relationship has been reached, two miniscrews of 1.5 mm diameter (K1, 8/10 mm HDC Sarcedo Italy etc) are inserted in the buccal side mesial to the first molars with a perpendicular or oblique direction to the cortical bone while the transpalatal bar and the miniscrews in the palate are removed.

At the same time we complete the application of the brackets in the upper arch.

The alignment phase is performed by using a super-elastic wire (NiTi 0.016 × 0.022 inch)



provided with stops positioned mesial to the first molars and hooks fixed mesial to the canines.

A 0.012 inch metal ligature is applied from the miniscrews to the hooks in the arch wire preventing mesial sliding of the first molars, with the loss of the Class I relationship.

Due to the fact that the upper molars have been distalized in a super class I relationship, the stops can be fixed slightly mesially to the first molars which can allow for a minor mesial movement of the first molar, speeding up the alignment phase. (Fig.4)

Fig. 4 The alignment phase with a NiTi wire 0.16x0.22, a crimped stop mesial to the first molar and a metal ligature from the miniscrew to the hook mesial to the canine. Simultaneous distalisation of the first premolar and canine can be started immediately.

In contrast to the conventional alignment procedure, the premolar and canines distalization is started immediately by using light forces in form of elastic chain or 50 gr coils from the teeth to the miniscrew .

To have a better root control, short power arms inserted in the vertical slot of the attachment can be used during this phase to move the distalisation vector closer to the centre of resistance of the teeth (Fig. 4 bis).

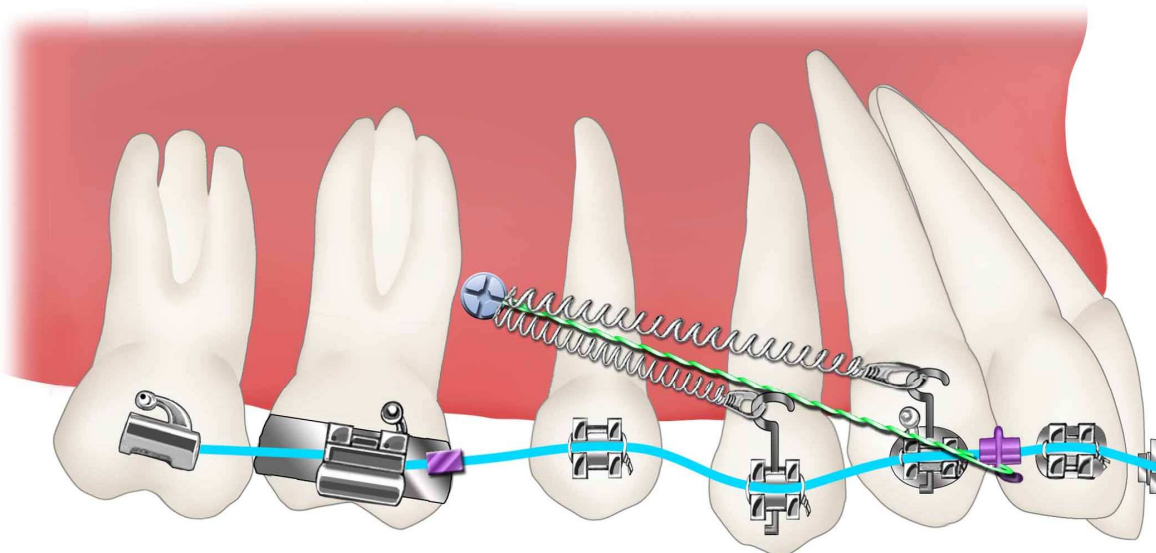
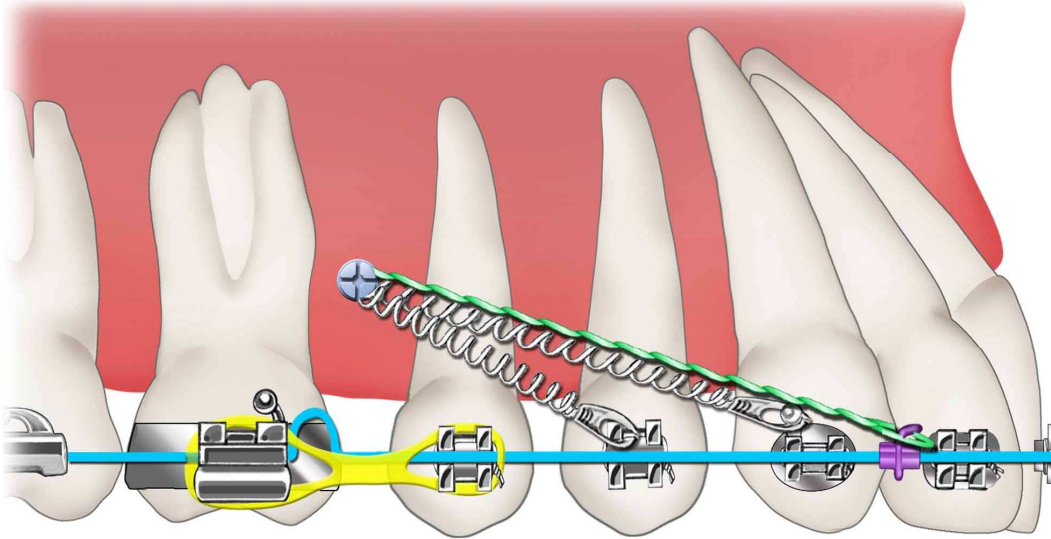


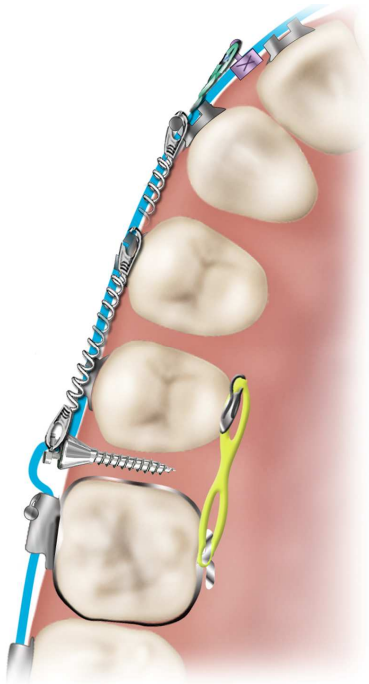
Fig. 4 bis: Alignment phase and simultaneous distalisation of the canine and first premolar through the use of power arm inserted in the vertical slot of the brackets.

Once the alignment is complete, a 0.016 × 0.022 inch SS wire is inserted with a stop mesial to the first molars, and hooks mesial to the canines.

A 0.012 inch metal ligature is tighten between the miniscrews and the hooks to stabilize the molars. The simultaneous retraction of the canines and the first premolars is continued, with 100-150 gr forces directed from the miniscrew to the teeth (direct anchorage). If the upper first molars has been distalized in super class I relationship,



many times the second premolar don't need to be retracted, reaching spontaneously the Class I position.



Otherwise, if distal movement of the second premolar is required, a Class I force from the first molar (indirect anchorage) is used either from the buccal and/or the palatal side to retract the second premolar preventing any undesired rotation (Fig.5)

Fig 5 (a-b): Phase 2. Simultaneous retraction of the first premolar and canine using coils from the miniscrews to the teeth (direct anchorage). Retraction of the second premolar using elastic chain from the first molar (indirect anchorage) is not always necessary.

The fact that we inserted a stop in the archwire mesially to the first molars and a crimped hook between the lateral incisors and the canines connected by a metal ligature to the miniscrews permits to choose the desired form of direct or indirect anchorage in the relation to the clinical needs.

Rispetto all'ancoraggio tradizionale, l'utilizzo delle miniviti , consente l'arretramento simultaneo sia dei premolari che dei canini e permette una significativa riduzione dei tempi di trattamento.

Inoltre, con la metodica così descritta il bondaggio della arcata inferiore può essere posticipato al completamento della Fase II riducendo gli effetti negativi quali il minore rischio di carie per il paziente e minor impiego di tempo alla poltrona per l'operatore.

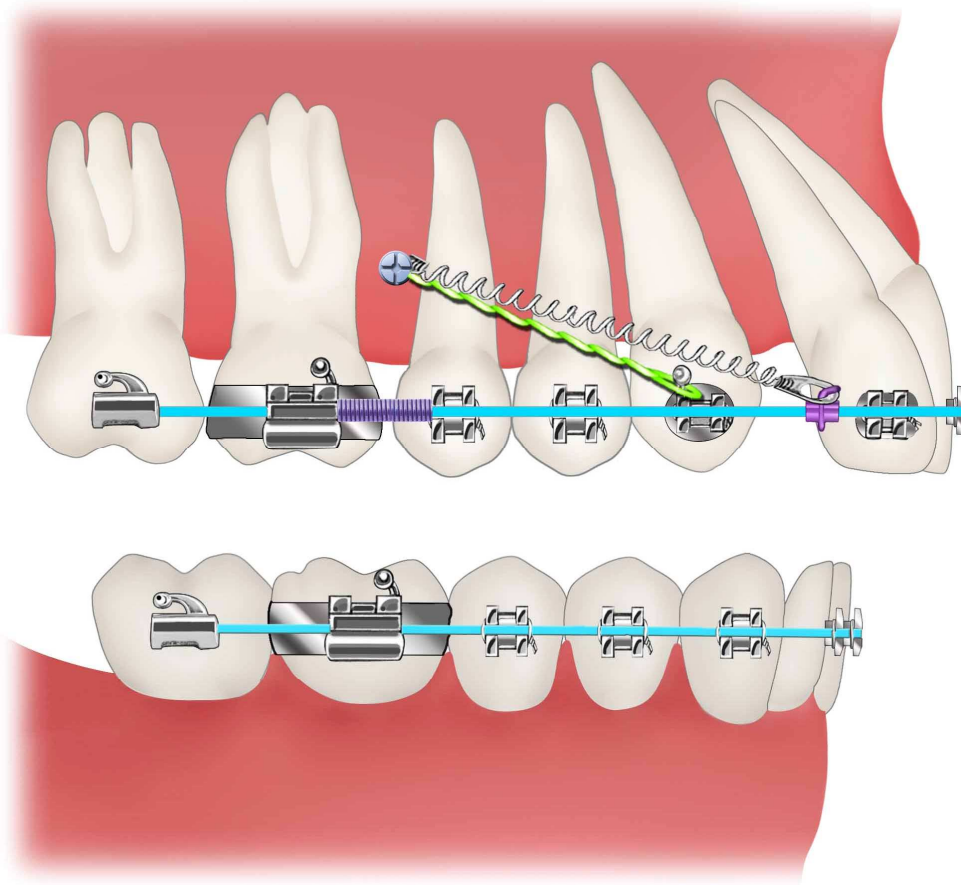
CLINICAL TIPS FOR PHASE 2

- In severe Class II malocclusion, Sometimes placing an elastic chain directly from the first molars to the second or first premolars instead from the miniscrew is needed, because applying it from the miniscrews results in excessive intrusive component.
- The stop on the .016X.022 SS archwire has to be in contact to the first molar , and the metal ligature between the miniscrew and the hook has to be tight.

Phase 3: Retraction of the incisors

Once premolars and canines has been reached Class I , the retraction of the upper incisors is started using a sliding mechanics.

A 0.018 × 0.022 inch SS wire with hooks clamped distally to the lateral incisors is applied.



A piece of closed coil is placed between the second premolar and the first molar to act as a space maintainer to prevent possible contact of the mesial root of the first molar with the miniscrew.

A new metal ligature 0.012 inch is placed from the miniscrews to the canines to keep the canines, premolars and molars in class I relationship.

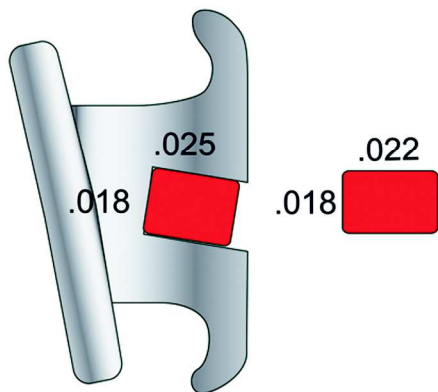
Two 300 g NiTi coils are positioned, one on each side, from the miniscrews to the hooks on the arch wire, to retract the incisors (Fig.6).

Fig. 6: Phase 3. The canines are blocked to the miniscrew with a metal ligature. Retraction of the incisors is provided with a coil from the miniscrew to the hooks crimped to the arch wire.

A piece of closed coil is placed between the first molar and second premolar to prevent root contact with the miniscrew.

Due to the complete coupling between the wire (0.018 × 0.022 inch) and the slot in the brackets of the frontal group (0.018 × 0.025) that is characteristic of the Bidimensional Technique, the distal movement of the incisors occurs as a group. In cases where the radicular length is greater than average, whenever it is necessary to implement the torque control of the frontal area as in adult patients, a thicker wire 0.018 × 0.025 inch SS can be used (Fig.7)

FRONTAL AREA: UPPER INCISORS



LATERAL SEGMENT

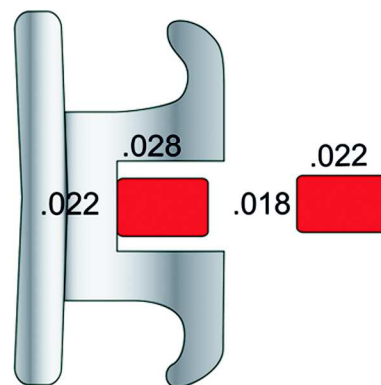


Fig. 7: Coupling of the full thickness of the 0.018 × 0.022 inch SS in the slots in the anterior brackets, and the accompanying sliding of the lateral sectors.

In general, as the major part of Class II malocclusions have deep bite, at the same time as the retraction of the incisors is accomplished, it is necessary to achieve the bite opening .

According to need of each case and based upon the smile esthetic⁴, the bite can be opened by intrusion of the upper or the lower incisors, with extrusion of the molars, and/or with a combination of these methods.

Due to the fact that using miniscrews as anchorage the center of resistance of the maxilla (almost coincident with the miniscrew) is changing in respect to the center of resistance when using conventional orthodontics (between the lateral incisors and the canine root), some consideration on the biomechanics should be done.

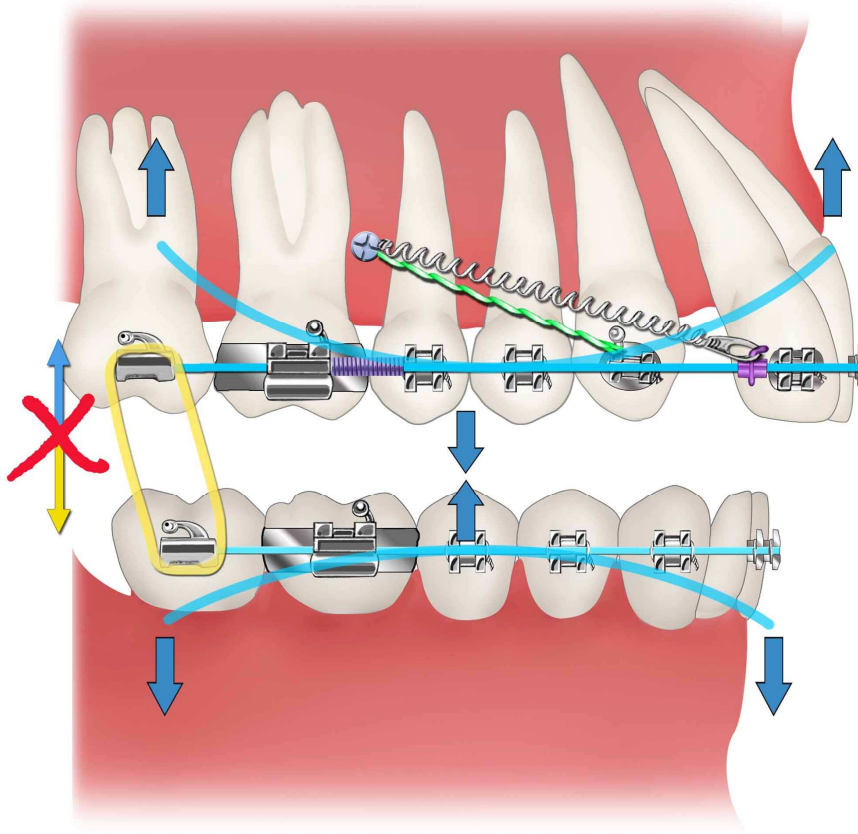
When applying forces from the miniscrews to the frontal teeth, due to the fact that the resultant of the forces applied to retract the incisors is passing below the center of resistance of the incisors, there will be a tendency to rotate the mandibular plane (Clockwise rotation) with intrusion of the molars and extrusion of the incisors⁵

A tipping of frontal teeth is expected with torque loosing and worsening of the deep bite. In order to prevent these adverse effects one option could be the use of crimped power arms ,. In this way the point of force application can be changed according to the length of the power arms passing below, upper or at the same level of the center of resistance of the incisors as needed.

The use of Power arms on the other hand makes the teeth movement slower, the teeth cleaning difficult and often they hurt the soft tissues.

By using a Bidimensional Technique that allows a coupling of the full thickness 0.018 × 0.022 inch SS wire in the slots in the anterior brackets (0.018 × 0.025), many of these adverse reaction can be controlled during the retraction of the upper incisors avoiding the use of power arms .

In fact, a 0.018 × 0.022 inch SS arch wire is inserted with an exaggerated curve of Spee on the upper arch and a reverse curve of Spee on the lower. At the same time, vertical elastics are used between the upper and lower molars to prevent their intrusion and



counteracting the posterior component of the rotation of the occlusal plane.

Doing in this way, only an intrusive force on the upper and lower incisors will be allowed to act thus counteracting the extrusive component of the incisors due to the class I forces applied from the miniscrew to the clamped hook on the arch wire (Fig.8)

Fig.8. Phase 3: An exaggerated curve of Spee on the upper arch and a reverse curve of Spee on the lower. The vertical elastics in the posterior part of the mouth prevent intrusion of the molars.

Furthermore, the complete fitting of the arch wire (0.018 × 0.022) in the slot of the pre-torqued brackets of the incisors (0.018 × 0.025) prevents their palatal tipping, allowing a

controlled movement of the roots minimizing the extrusive component of the incisors due to the palatal crown tipping.

This double effect (intrusion and bodily movement of the incisors) will be effective in controlling the anterior component of the rotation of the occlusal plane.

Therefore the use of power arms could be restricted to the very severe and resistant deep bite cases.

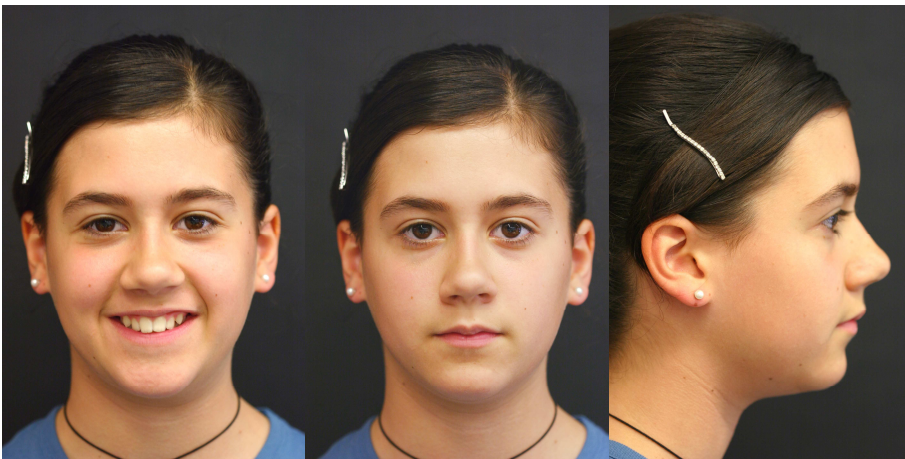


Fig: 9 A-B-C



Fig D-H

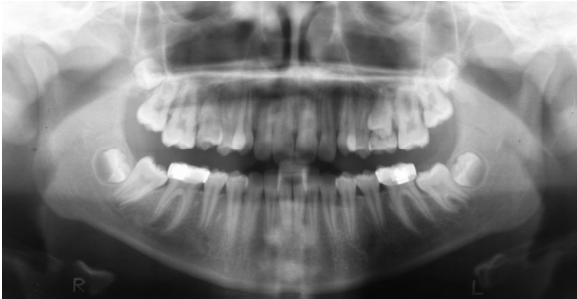


Fig. 9 (A-J) : a female patient treated with the MGBM system without extractions. Pretreatment: extraoral (A-C) and intraoral photographs (D-H), and panoramic (I) and lateral cephalometric radiographs (J).



Fig. 9 (K-M) : Phase 1 (distalization of the molars): buccal view (K-L) showing the SUMODIS. And occlusal view (M) showing the transpalatal bar connected to the palatal MIs through metallic ligature wires,

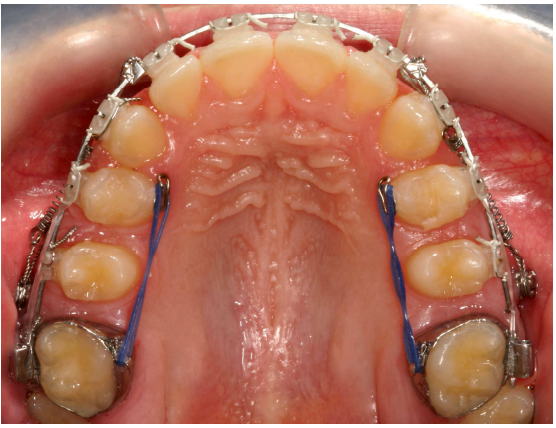


Fig. 9 (N-Q) :Phase 2: simultaneous retraction of the premolars and canines with buccally inserted MIs



ERROR: ioerror
OFFENDING COMMAND: image

STACK: