

MALPOZİSYONLU DİŞLERİN SIRALANMASINDA BASİT İKİ ARK TELİ SİSTEMİ

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ÖZET: Ark çizgisinden önemli ölçüde sapan dişlerin sıralanması için iki nikel titanyum ark teli yada bir nikel titanyum ark teli ve bir paslanmaz çelik ark teli kullanılan sabit bir uygulama tarif edilmiştir.

Anahtar Kelimeler: İki tel sistemi, gömülü diş, malpoze diş, dişlerin sıralanması

ABSTRACT: A SIMPLE TWO ARCHWIRE SYSTEM FOR THE ALIGNMENT OF MALPOSITIONED TEETH A fixed appliance two archwire system using either two nickel titanium archwires or a nickel titanium archwire and a stainless steel archwire to align teeth significantly displaced from the line of the arch is described.

Index Words: Two wire system, Impacted teeth, Malpositioned teeth, Tooth alignment.

INTRODUCTION:

Using two archwires in one arch to align malpositioned teeth is an idea that has been utilised by several fixed appliance techniques over the years. The introduction of superelastic nickel titanium archwires (Niti) with shape memory (1) providing light continuous forces over a considerable distance created new possibilities of adding to these dual wire techniques.

METHOD:

A two-wire system is described which has been used for over 10 years to align impacted and malpositioned teeth. It utilises the shape memory and light continuous force properties of the superelastic nickel titanium archwires (Niti) used with a preadjusted fixed appliance system with an 0.022" x 0.028" slot. Initially the majority of the teeth are aligned using a single 0.014" nickel titanium archwire. The malpositioned teeth are not attached to this initial aligning archwire, but if space is required for these teeth it can be created at this stage (Figure 1, 2).



Figure 1. Push coil on an 0.014" Niti archwire is opening space for the unerupted canine prior to its surgical exposure and attachment of a gold chain.

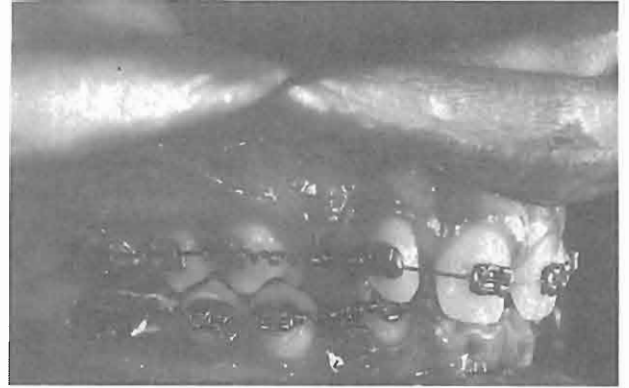


Figure 2. Adequate space is being created by push coil on 0.014" Niti archwires in the upper and lower arch. The gold chains bonded to the upper and lower canines are passively attached to the single archwire in each arch at this stage.

Once the majority of teeth are aligned on the 0.014" Niti archwire and adequate space has been created for the malpositioned tooth a second archwire is incorporated into the slots. The 0.014" Niti is reduced in length, becomes the traction archwire and is positioned in the base of the slot. It extends at least two to three teeth either side of the space for the malpositioned tooth and can be stabilised temporarily with one or two elastic ligatures. A second or anchorage archwire is placed over it in the

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same slot and extends from the upper first molar on one side to the upper first molar on the other. Elastic ligatures are then placed over both archwires on the remaining free brackets. The elastic ligatures holding only the traction archwire are then removed and replaced with ligatures engaging both archwires in the slot (Figure 3).

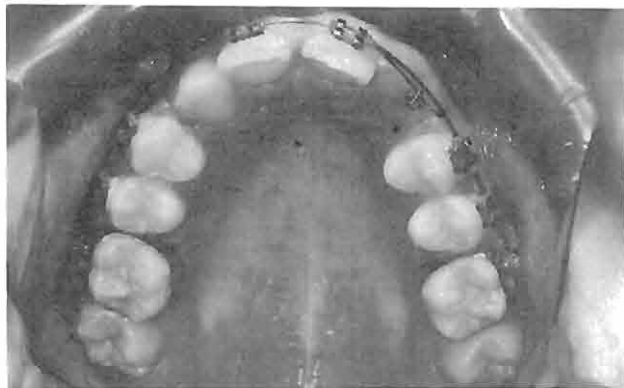


Figure 3. An anchorage archwire of 0.018" Niti supports an 0.014" traction archwire attached to a gold chain bonded to an unerupted canine.

The first of the anchorage archwires can be as small as 0.016" Niti when traction is first applied to the malpositioned tooth with the 0.014" Niti traction archwire. This can be increased in size at the following visit to 0.018" Niti. Originally the system was used with transpalatal arches and traction was not applied until the anchorage archwire was at least an 0.016" stainless steel wire. The transpalatal arch is no longer used routinely, and it is unusual to employ a stainless steel anchorage archwire. An 0.016" or 0.018" or 0.020" Niti wire can provide adequate anchorage in the vast majority of cases provided that light forces are used and there is adequate space for the malpositioned tooth. If required the space for the malpositioned tooth can be maintained with coil spring or tubing on the anchorage archwire while traction is being carried out (Figure 4). The traction archwire is ligated to the malpositioned tooth via a stainless steel ligature or in the case of impacted tooth, a gold chain. The traction archwire is activated by deflecting it towards the malpositioned tooth or gold chain approximately 3-4 mm with a tucker and ligating the tooth or gold chain with a soft stainless steel metal ligature to the traction archwire. The twisted ligature is cut and then turned on itself to prevent soft tissue irritation (Figure 4).

The aligning force is applied to the unerupted or malpositioned tooth by the superelastic shape memory properties of the 0.014" nickel titanium traction archwire as it slides back through the slots underneath the anchorage archwire to regain its original arch form. The dental archform is maintained by the anchorage archwire.



Figure 4. Push coil on the anchorage archwire maintains the space for the unerupted canine. Traction is being applied to the canine by the 0.014" Niti traction archwire via a gold chain attachment. The traction archwire is seated in the base of the slot under the anchorage archwire.

The traction archwire is reactivated approximately every 4 to 6 weeks by redeflecting the traction archwire, replacing the wire ligature and removing links of gold chain if required. Progress can be measured by counting the links of gold chain removed or observing tooth movement at each visit. Treatment within the opposing arch can proceed at the same time as traction is being applied. If alignment of a malpositioned tooth is carried out in the mixed dentition the deciduous teeth can be included on the archwire to provide additional anchorage. Permanent canine brackets have been successfully used on the deciduous canines and upper central incisor brackets with the slot positioned horizontally on deciduous molars (Figure 5).



Figure 5. The upper deciduous canines and molars are bonded and included on the archwire to provide additional anchorage. The tip and torque in the upper central incisor brackets on the deciduous molars is not expressed during alignment of the malpositioned teeth. In this patient two upper supernumerary teeth have been surgically removed and the upper central incisors are being aligned. At this stage in alignment the upper lateral incisors are not included on the archwire as they are only just erupting. More space for the upper incisors will be created in due course with push coil.

When the crown of an impacted tooth is within 2 to 3 mm of the anchorage archwire and the eyelet pad can be exchanged for the correct bracket, and secondary levelling and alignment can proceed with a single 0.014" Niti archwire. Once the malpositioned tooth is fully engaged on the 0.014" Niti archwire then the archwire sequence of the operators choice can continue to complete treatment (Figures 6, 7).



Figure 6. The tip of the canine is just erupting exposing the eyelet pad which is attached to the traction archwire. At the next visit the eyelet pad can be replaced by a bracket, the anchorage archwire dispensed with and the second stage of alignment continued with a 0.014" Niti archwire.



Figure 7. A lower canine has had a bracket bonded to it to help align the tooth. The lower left lateral incisor is left off both archwires until the canine is within the line of the arch. Then the lateral will have a bracket bonded and aligned.

This system would appear to be very light on anchorage and movement of the teeth next to the malpositioned tooth is uncommon provided light forces are used and adequate space is provided for the malpositioned tooth. However if the movement of the malpositioned tooth is impeded in any way then early movement of the ancho-

rage archwire will quickly reveal the problem and traction can be discontinued at the next visit until the source of the obstruction is located and relieved. If necessary the Niti anchorage archwire can be replaced with a stainless steel archwire. Impacted teeth are encouraged to erupt through attached gingivae on the crest of the alveolar ridge to encourage optimum periodontal support and to avoid occlusal interference's during alignment. Activation is quick and easy and is not dependant upon patient co-operation as with removable appliances or elastics (2,3). Increase in clinical time due to wire bending mechanics is avoided (2,4,5,6). It can be applied to a variety of malpositioned teeth including impactions 7, with a variety of modifications (Figures 8, 9, 10), in either arch (Figure 2 and 7).



Figure 8. Space has been opened for a palatally displaced upper lateral incisor which now has a bracket bonded to it and traction is being provided by an 0.014" Niti archwire and anchorage by an 0.018" Niti archwire .

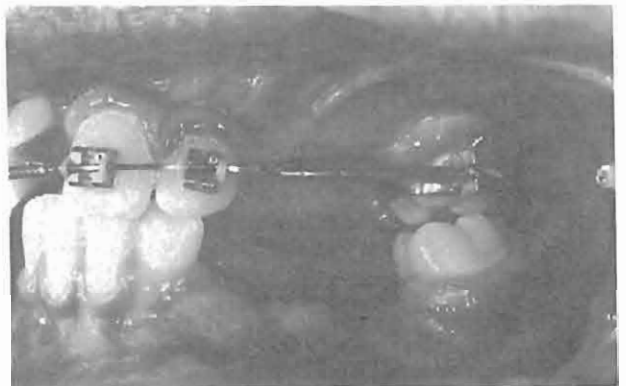


Figure 9. Where teeth are not available to hold the archwire the long lengths can be supported with stainless steel tubing.

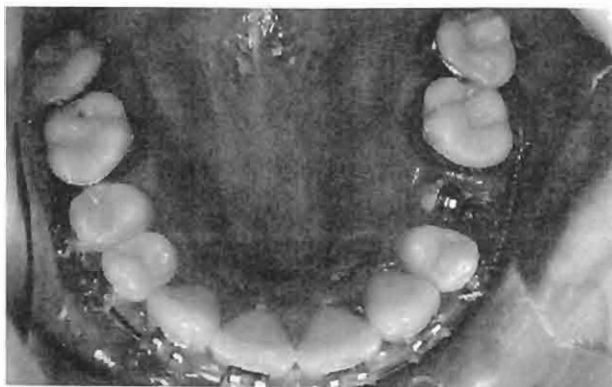


Figure 10. Because there is no bracket distal to the impacted second premolar tooth the auxiliary or EOT tube on the molar band is used to provide support for the traction archwire.

CONCLUSIONS:

1. The technique uses the advantages of light continuous forces and the shape memory effect of nickel titanium archwires.
2. Any impacted tooth is encouraged to erupt into the line of the arch to encourage good periodontal support.
3. Other aspects of the malocclusion can be treated at the same time.

4. It is light on anchorage, reduces clinical time, avoids removable appliances and can be applied to a variety of malpositioned teeth.

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