

DR. MAURICIO BALLESTEROS INTRODUCES TIP-EDGE TO THE NATIONAL UNIVERSITY OF MEXICO DEPARTMENT OF ORTHODONTICS.



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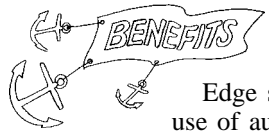


DR. BETNY SUMANTRI'S RECENT LECTURES ON TIP-EDGE WELL ATTENDED BY INDONESIAN ORTHODONTISTS.

FALL 1994

EDGELINES

VARIABLE ANCHORAGE BENEFITS ALL:



Design of Tip-Edge slot plus use of auxiliaries varies the duration and degree of anchorage. Cover story.

DEALING WITH CANINES:

The prevention and cure of canines impacted due to loss

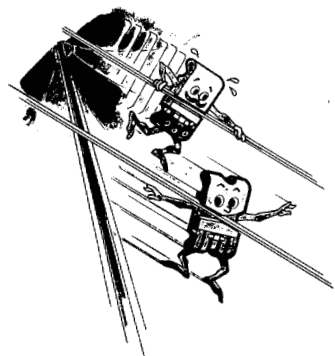


of arch length. Page 3.

SUPER TORQUE BARS:

Tooth roots can "fly" through 10° or more of torque with no adjustments required. Page 3.

TIP-EDGE GRAPHIC



Tippy's Uncle Edger always has a hard time keeping up in the sliding finish to their act.

Tip-Edge® Brackets Can Benefit All Edgewise Techniques Through Variable Anchorage Control

The Tip-Edge bracket features the first and only archwire slot that offers variable control levels. It's .022" archwire slot can increase in size to .028" relative to the archwire during retraction yet close back down to .022" to facilitate final finishing. Variable control eliminates the excessive anchorage strain and bite deepening that occurs during retraction with conventional edgewise appliances. This in turn allows for far simpler treatment mechanics and much less reliance on extraoral forces.¹

Surprisingly, many orthodontists are unaware of this feature and the manner in which it can simplify all edgewise orthodontic techniques. In his latest text Proffit reiterates that the ideal bracket "would provide a variable size archwire slot." However, he laments that such a bracket has not yet been developed.²

Why variable anchorage control levels?

With conventional edgewise archwire slots, all teeth are rigidly locked throughout treatment at angulations that are only beneficial for final finishing. This makes anchorage management unnecessarily difficult. Often the teeth requiring retraction offer more resistance to tooth movement (anchorage) than the desired anchorage units themselves³. Although the difficulties encountered in retracting teeth with the edgewise appli-

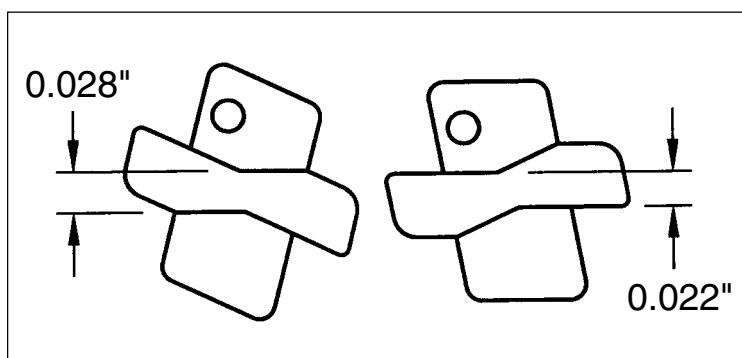


Figure 1. The Tip-Edge bracket's archwire slot is the first and only to actually change in size to facilitate tooth movements and finishing. During retraction the archwire slot can open to .028" to facilitate the large amounts of tooth movement often required during this phase of treatment. After retraction has been accomplished, the archwire slot closes down to .022" to provide the high level of three dimensional control required for final finishing. This feature offers dramatic benefits for all edgewise techniques.

ance are almost exclusively iatrogenic they have existed for so long (since the introduction of the edgewise archwire slot in the 1920's) that many orthodontists consider them to be an unavoidable biological fact.

In reality, teeth will move easily and quickly in response to very light forces if the artificial constraints generated by the edgewise archwire slot are removed. Unrestrained teeth readily tip in response to mesiodistal and intrusive forces. Historically, edgewise techniques have attempted to avoid tipping due to a lack of an efficient means for uprighting.

Two features of the Tip-Edge archwire slot contribute to its overall ability to produce variable levels of control when and where they are desired. The first is the ability of the archwire

slot to increase in size relative to the archwire as retraction proceeds. The second is the variable anchorage potentials that can be generated—depending on the direction of the forces applied to each tooth.

Variable archwire slot size

The Tip-Edge archwire slot is unique in that it actually increases in size in relation to the archwire as the tooth tips during retraction going from .022" to .028" (Figure 1). This not only facilitates the large amount of tooth repositioning that is often required during retraction, but also makes it far easier to progress to larger archwires. With the Tip-Edge bracket treatment routinely progresses directly from the initial .016" archwires to either .022" round

Continued on page 2

Tip-Edge Benefits All

Continued from page 1

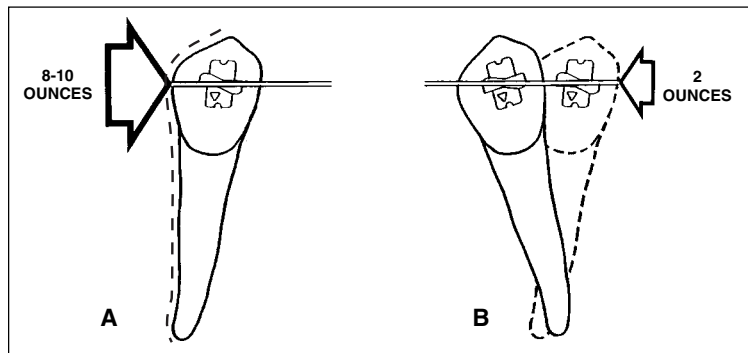


Figure 2 (A & B). Example of a Tip-Edge bracket's ability to differentiate between anchorage and free tipping— A) When force is from the distal, archwire slot design prohibits tipping—it becomes an anchor tooth. B) A relatively light force from the mesial of same tooth results in crown tipping to promote retraction and/or space closure.

or .0215 X .028" stabilizing archwires for final uprighting and torquing. This feature allows for the correction of even the most severe malocclusions using only four "straight" archwires. Patient comfort is also maximized when moving up to larger archwires and the problem of bracket debonds when initially engaging larger archwires is virtually eliminated.

Variable anchorage potential

With the Tip-Edge archwire slot, two distinct types of tooth movement are possible depending on the direction of the force applied to each tooth. When mesially directed forces are delivered, only bodily tooth movement can occur (with the exception of second premolars in first premolar extraction treatment). When distally directed forces are delivered, limited tipping of the teeth occurs (Figure 2.). When light Class II or III

elastics are worn, highly beneficial anchorage relationships (imbalances) are automatically generated between the dental arch to be retracted and the one to serve as anchorage.

During both extraction and nonextraction Class II treatment, the use of Class II elastics pits bodily movement of the teeth in the mandibular arch against controlled tipping of the entire maxillary dental arch. Thus mandibular anchorage exceeds the very light force levels required to retract the maxillary dental arch in both extraction and nonextraction treatment. (Figure 3a).

The Tip-Edge archwire slots automatically reverse their mechanics when light Class III elastics are worn. Therefore during Class III treatment, the maxillary dentition is limited to bodily movement while the teeth in the mandibular arch are free to tip distally towards a Class I relationship (Figure 3b).

Variable control levels: a beneficial concept for all techniques.

There is an enormous difference between an orthodontic bracket and the concept of an orthodontic technique. Many orthodontists feel that only one bracket system can be used in conjunction with a specific technique. However all edgewise orthodontic techniques can benefit from the increased efficiency and simplified treatment mechanics offered by an improved archwire slot design.

The variable levels of control offered by the Tip-Edge archwire slot make any orthodontic technique more efficient. Tweed tip-back retraction mechanics can be induced without second order wire bending. Headgear forces will produce results in half the time. Lip bumpers will also be more effective. The problems of arch-

wire deflection when retracting canines are totally eliminated.

Was the "latest and best" orthodontic bracket developed in 1925 never to be improved upon? Definitely not. Angle spent the last years of his life continuously modifying and improving the design of a succession of orthodontic appliances and brackets. Perhaps the time has come to take the next step in the evolution of the edgewise appliance. A step towards an appliance with a dynamic archwire slot that can facilitate retraction and bite opening to the point that treatment mechanics of all techniques can be radically simplified. 📌

References

- ¹Kesling, PC. Expanding the horizons of the edgewise archwire slot. *Am J Orthod* 1988; 94:26-37.
- ²Proffit, WR. *Contemporary Orthodontics*. 2nd ed. St. Louis, Missouri: C.V. Mosby, 1992.
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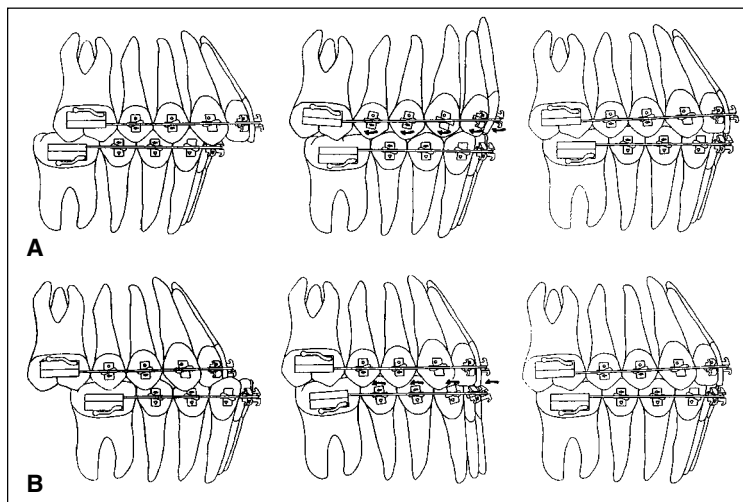


Figure 3 (A & B). Variable anchorage control sets up highly beneficial anchorage potentials once Class II or III mechanics are initiated. A) During Class II treatment the maxillary teeth are easily retracted through controlled and limited tipping while the mandibular arch is limited to bodily tooth movement. B) During Class III treatment, the maxillary arch is limited to bodily movement while the mandibular arch can be retracted through limited tipping to a Class I relationship using very light forces.

Q's and A's

Q. Why not let the round archwires fall into the Deep Grooves of incisor brackets during the entire treatment? There would be no "antagonisms" between a round arch and a Deep Groove.

SARREGUEMINES, FRANCE

A. If an archwire, even though it is round, were placed in Deep Grooves, the incisors would not be able to tip distally. This would eliminate one of the greatest advantages of Tip-Edge brackets.

Studies of the differential movement of individual teeth and clinical observations clearly show that incisors must be free to tip distally as well as labiolingually during retraction and bite opening. If they

are restrained from such movements, retraction and bite opening will require additional force (perhaps even extraoral) and take more time. Both would contribute, of course, to the unnecessary loss of anchorage.

Incisors will even tip distally in nonextraction treatment – especially during the opening of deep anterior overbites. In these cases it may be that the root apices are moving *mesially* more than the crowns are moving *distally*. However, the result is the same – a change in the mesiodistal inclination of the teeth that could not occur if the archwire were in edgewise (Deep Groove) slots.

Dealing With Canines

Sometimes when canines are quite pointed, use of jigs for bracket placement will not properly locate the brackets on the crowns. The height of contour and, therefore, mesial and distal contact points will be located too

far gingivally causing the canine to become “impacted” between the premolar and lateral incisor. (Figure 1).

To prevent this problem, it is best to reduce the canine tips with a stone prior to bracket placement.

If the problem occurs during treatment, the bracket should be repositioned further gingivally and elevated with a light archwire (Figure 2).

After proper leveling, the canine tip can be recontoured if necessary. Good contacts between the canine and adjacent teeth are then established (Figure 3).

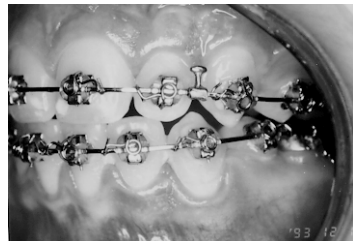


Figure 1. Mandibular canine is crowded and out of occlusion due to poor bracket placement.



Figure 2. Bracket relocated further gingivally. Original .016" mandibular archwire replaced to elevate canine.



Figure 3. Mandibular canine is now in good occlusion with proper contacts restored.

New “Super” Torque Bars

To enhance their effectiveness, the cross-sectional dimensions of nickel titanium Torque Bars has been increased from .022" X .016" to .022" X .018" resulting in new stronger or “Super” Torque Bars. This significantly increases the active torquing forces delivered by these auxiliaries when used in conjunction with Deep Groove Tip-Edge brackets in two distinct ways.

The increased thickness of the new Torque Bars brings with it a corresponding increase in stiffness and consequently the amount of torquing forces produced. Their effectiveness is further increased since the two outer corners of the auxiliary are shifted .002" outside of the Deep Groove archwire slot when fully engaged. The corners which are slightly radiused due to manufacturing tolerances, could contribute to rotation of the Torque Bar if located within the archwire slot. Moving them out of the slot improves Torque Bar “grip” by increasing the flat contact area between bar and the slot (Figure 1).

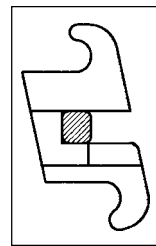


Figure 1. New “Super” nickel titanium Torque Bars deliver more torque due to increased thickness. The labial corners of the auxiliary extend slightly out of the Deep Groove archwire slot which also improves the grip between auxiliary and archwire slot.

Clinically, the increased torquing force of the .022" X .018" Torque Bars is immediately apparent upon insertion. The procedure used to engage “Super” Torque Bars remains the same as that used with original Torque Bars.¹ Due to their increased torquing effectiveness, these auxiliaries are usually only extended through the lateral incisors. This not only makes engagement easier but also serves to maintain the proper in/out relationship between the maxillary canines and lateral incisors. When properly engaged, Torque Bars produce an average of 2 degrees of palatal root torque per month.

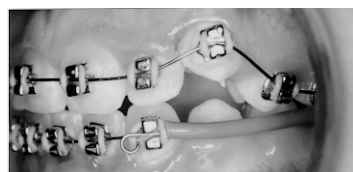
¹Tip-Edge Today, Fall 1992.

CASE REPORT

An 11-year-old female exhibited a Class II type malocclusion. The mandibular first premolars lacked space for eruption and the maxillary canines were completely blocked out. The maxillary left lateral incisor was in crossbite and the midline was one tooth off. Due to the patient’s age and flatness of her profile, nonextraction treatment with the Tip-Edge appliance was begun.



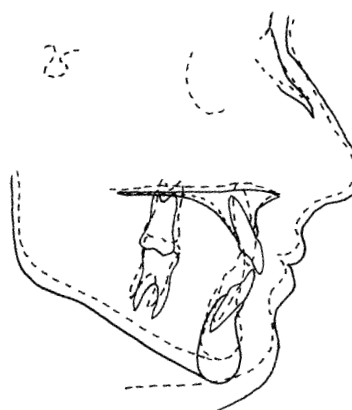
Initial archwires of .016" Wilcock wire. The maxillary has loops and a molar stop to create space for the blocked out canines and to move the maxillary lateral out of crossbite. A coil spring on the mandibular archwire opens space for the first premolar.



After space has been created, the maxillary canines are brought into occlusion with an .016" nickel titanium wire. Bumper-Sleeve® maintains space for the yet unbracketed mandibular premolars.



.022" x .028" replace .016" maxillary and mandibular archwires. Side-Winder springs on incisors and canines torque and upright teeth to ideal angulations. Note: Labial root torque on the maxillary left lateral is automatically accomplished.



J.W. Female, 11 Years
Class II
Non-Extraction
Archwires Used 8 (5U, 3L)
Adjustments 19, **Time:** 25 Months
Retention Positionette

Cephalometric Changes:

	Start - Dotted	Finish-Solid
1-APo	-3.0 mm	+1.0 mm
Wits	0.0 mm	-1.0 mm
SN-MP	38.0°	40.0°
ANB	3.5°	2.0°
SNA	76.0°	73.0°
SNB	72.5°	71.0°
1-SN	86.0°	98.0°

Comments on Nonextraction Treatment And The Edgewise Appliance

By Dr. Gordon Magnusson

The point made by Dr. Peter Kesling* that Dr. Angle may have promoted nonextraction treatment because of limitations in his appliances is well taken. When I was using conventional edgewise brackets with static archwire slots, I was constantly frustrated with my inability to achieve good results in extraction cases!

Adjunctive to this premise, I feel that the popularity of second molar extraction therapy today is simply that by extracting second molars, which are located at the ends of the arch, the case then becomes, for all practical purposes, a nonextraction case. There is no break in the continuity of the dental arches. It can be hypothesized that those orthodontists who lack the skills to properly handle an extraction case and/or are handicapped by static archwire slots, may be attracted to the second molar extraction treatment approach!

A second hypothesis could be made that those orthodontists who wish to run an assembly-line practice with assistants doing all the work within the mouth are attracted to nonextraction treatment (including the second molar extraction approach) as their assistants can place a series of preformed archwires that require little, if any, personal attention from the doctor.

What they don't know, of course, is that the Tip-Edge bracket is the ultimate bracket for use in practices which utilize extensive delegation of duties to assistants. For me and mine, however, I will continue to treat my patients with the Tip-Edge bracket myself because...its more fun than I've ever had in 37 years of orthodontics!

*TIP-EDGE TODAY, Summer 1994, pg. 4.



Dr. Mauricio Ballesteros, chairman (center, first row), and residents of the department of orthodontics of the National University of Mexico in Cuernavaca, Morelos. Dr. Ballesteros recently introduced the Tip-Edge Technique to the department where it is now being used as the main orthodontic technique for the treatment of patients by the residents.



A three day Tip-Edge course was presented this June by Dr. Andrew Richardson (fourth from right, kneeling) and Drs. Giuseppe and Regina Caponi in Bergamo, Italy. The course was filled to capacity with over 35 orthodontists from throughout Italy in attendance. Dr. Richardson is professor of orthodontics at Queens University of Belfast, Ireland.

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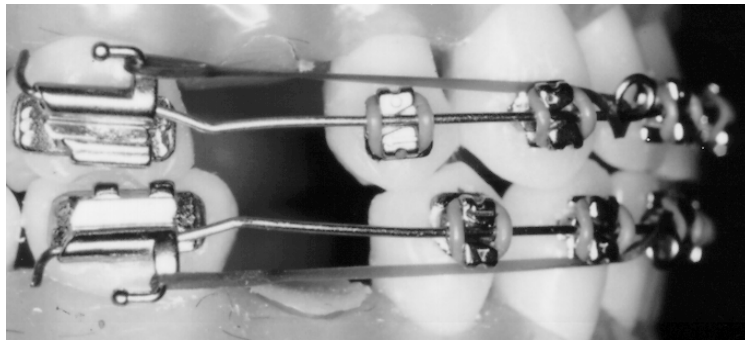
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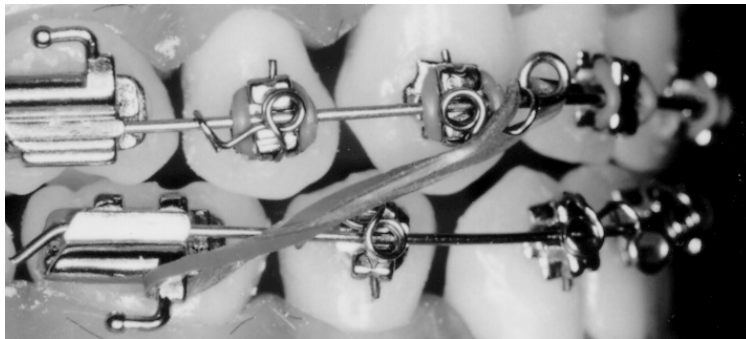
Special Feature: Tip-Edge Troubleshooting



Stage I



Stage II



Stage III

A specific problem encountered in each stage of treatment is demonstrated on these assembled typodonts. Can you spot the problems? (Answers on page 4.)

Troubleshooting answers: Stage I — Mixing of stages. During Stage I horizontal elastics are never used to correct the overjet or overbite. The only exception is during first molar extraction treatment. Stage II — Anchor bends present in .022" archwires. When using .022" archwires in Stage II or III only very mild bite opening curves are used. Placing strong bends in these heavy wires will tip the molars distally and roll them buccally. Stage III — Lower teeth are not ligated to the archwire. All teeth must be tied to the archwire before sidewinder springs are inserted and engaged.

Crimpable Hooks Can Eliminate Bending Ends of Rectangular Archwires

When using full size rectangular archwires during Stage III it can be difficult to remove the archwires for adjustments if the ends have been bent around distal to the molar tubes to prevent spaces from opening within the arch. TP's new crimpable hooks provide a quick and easy

solution to this problem.

Instead of leaving the ends of the archwires long and annealing and bending them distal to the molar tubes the ends of the rectangular wires the archwires are simply cut off flush to the rectangular molar tube. After Stage III has been assembled the hook is crimped down upon the rectangular wire directly mesial to the molar tube. An elastomeric ligature tie is then applied between the crimpable hook and the molar hook to keep spaces closed (figure 1).

Although crimpable hooks can sometimes slip along the wire TP's hooks feature a patented tungsten-carbide coating on the crimping surfaces which locks them securely in place. Due to the small size of these hooks it is highly recommended that special hook crimping pliers be used to carry them to the mouth and lock them into place (figure 2).



Figure 1. Crimpable hooks are placed just mesial to tubes and tied back to molar hook with an elastomeric ligature tie or short section (two circles) of power chain or E-link. Ends of archwires can then be cut off flush at distal ends of tubes.