

STIMULATING CONVERSATION OVER A CANDLELIGHT DINNER DURING A RECENT TIP-EDGE COURSE AT THE ORTHODONTIC CENTER.



TIP-EDGE TODAY™

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DR. T. ROCKE EXPLAINS FINE POINTS TO PROF. JOS DIBBETS, LEFT, AND PROF. HANS PANCHERZ, RIGHT, AT RECENT TIP-EDGE COURSE IN GIESSEN, GERMANY.

SPRING 1993
EDGELINES

NO ROTATING CANINES:
Application of distalizing force at contact points avoids rotation. Page 3.

MANDIBULAR DEEP GROOVE:
The versatile Deep Groove option is now available for mandibular incisors. Page 3.

MULTI-LINGUAL GUIDE:
Popular TIP-EDGE GUIDE is now available in seven languages. Page 4.



Out Torquing Conventional Edgewise Mechanics

By: R. C. Parkhouse, BDS, FDS, D.Orth RCS — Wales

Tip-Edge® can fairly claim to be the only bracket system to combine the ease of translation of differential tooth movement with the precise, three-dimensional finishing of preadjusted techniques. Tip-Edge allows the teeth to tip rapidly with ultra



R. C. Parkhouse

light forces into their desired crown relationships. During the later stages of treatment, Side-Winder springs acting against rectangular base arches can not only upright the roots, but also have a torquing capability which is altogether more sophisticated and physiologic than any existing preadjusted or standard edgewise system, (Figure 1A-D).

This may come as some surprise to traditional orthodontic thinking. The triangular cutouts of the Tip-Edge archwire slots that allow initial crown tipping make it impossible to torque teeth in the conventional manner with rectangular wires. This is because the torquing surfaces do not directly oppose each other vertically.

The fact that each torque surface is less than half the width of a Tip-Edge bracket enables the vertical space presented to the archwire by the slot to increase from .022" to a maximum of .028" during initial crown tipping (Figure 2).

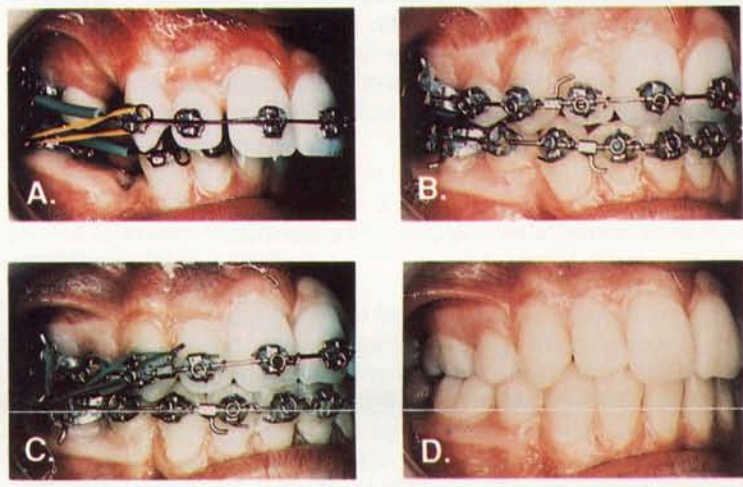


Figure 1. A) Place appliance — 11 years, 9 months, 12 mm overjet. Four first premolars extracted. Mandibular second premolars unerupted. B) Start of stage three after 1 year. Archwires, .0215" x .028". C) Towards end of stage three after nine months of torquing and uprighting. Class II check elastics worn at night to help settling. D) Final result after 2 years of active treatment.

This is why it is possible to jump from .016" to .022" arches midtreatment without the need for intermediate levelling arches of progressively greater thickness. Maximum crown tipping (and therefore slot opening) is normally gained at the end of stage two.

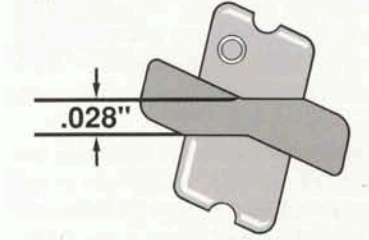


Figure 2. Offset torquing/uprighting faces cause the "effective" archwire slot to increase in size (up to .028") as the crown tips toward its final position.

It is during the closing phase of the archwire slot that torquing function is created. The start of stage three is, therefore, the time to insert .0215" x .028" base arches. Assuming correct alignment during stage two, the rectangular arches will fit as easily within the brackets as a .022" round arch with no torque effect. This is because the slots are opened up to .028". The molars, however, are immediately controlled (and, if necessary, torqued) by the precise fit of the rectangular archwire within the rectangular tubes.

Feeding a torqued archwire into a Tip-Edge bracket, even if the bracket is uprighted to its "closed" position, will tend to separate the upper and lower torque surfaces.

Cont. on Pg. 2

Q's and A's

Q. *I am beginning to incorporate Tip-Edge brackets on the canines in my conventional edgewise bracket (narrow preangled) technique. The canines retract more quickly and with much less force than I ever thought possible. My questions are, should I use rectangular archwires when uprighting the canines and should the patient continue with Class II elastics?*
WEST SENECA, NEW YORK

A. When uprighting distally tipped canines with Side-Winder uprighting springs the archwires need not be rectangular. However, they should be at least .020" round (stainless steel) to provide enough stiffness to resist deformation from the springs.

Of equal importance is the need to restrain the crowns from moving back mesially as the roots upright distally. A steel ligature from the anchor molar to the archwire mesial to each canine bracket is recommended. Ties to Power Pins are not recommended — if gingival, the crown will move mesially during uprighting — if incisal, the root will not be able to upright.

The patient will continue to need some Class II intermaxillary traction because the distal movement of the maxillary canine roots will have a tendency (however, relatively slight) to move the maxillary buccal segments anteriorly.

Q. *Should I avoid bracketing the mandibular anterior teeth at the start of treatment when a deep anterior overbite is present?*

RAPID CITY, SOUTH DAKOTA

A. Normally brackets are bonded to the six maxillary and six mandibular anterior teeth at the beginning of treatment — regardless of the degree of anterior overbite. Archwires and intermaxillary elastics are applied at the same appointment.

Patients may only occlude on the mandibular incisor brackets initially. However, their teeth will become tender resulting in a consequent reduction in occlusal/incisal forces. The design of the Tip-Edge archwire slots permit the anterior teeth to intrude relatively quickly under the light gingivally directed forces from the .016" Australian archwires.

Bite opening occurs so rapidly with the Tip-Edge technique that by the time the initial discomfort has passed, the posterior teeth are usually back in occlusion and the patient is no longer occluding solely on the mandibular incisor brackets.

Of course, it would not be advisable to place ceramic brackets on any teeth, even for a relatively short period of time, if there were a possibility the opposing teeth would strike these brackets.

Q. *I am in the third or final stage of treatment and would like to use a rectangular archwire for torquing in the lower arch. What size wire should I use?*
THUN, SWITZERLAND

A. A full-size (.0215" x .028") rectangular archwire should be used for torque control with Tip-Edge brackets. It can have soldered posts or crimpable hooks mesial to the canines as intermaxillary hooks. Also vertical circles can be bent directly into the wire for this purpose—as is customary with round archwires.

However, Side-Winder springs must be placed on all teeth that are to be torqued. (TIP-EDGE GUIDE Pgs. TE-36-42). The torque in the base of Tip-Edge brackets is designed to achieve proper labiolingual inclinations for a Class I apical base skeletal pattern. For severe (Wits 5 mm ±) anteroposterior arch discrepancies, it would be necessary to compensate by placing torque (third order) bends in the archwires themselves.

It is also possible to torque maxillary or mandibular incisors with a nickel titanium Torque Bar in conjunction with a round .022" base archwire. This auxiliary is most effective when used in conjunction with Tip-Edge brackets with Deep Grooves. (T-E GUIDE Pg. TE-34.)

Out Torquing

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This causes the archwire slot to "open" which the tooth is able to accommodate by mesial root movement (Figure 3).

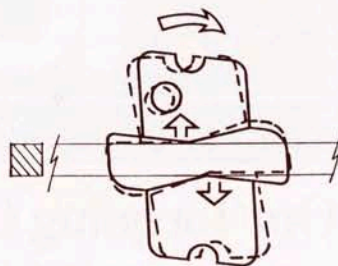


Figure 3. Placing a torqued archwire into a Tip-Edge slot causes the upper and lower torque faces to move apart as the root moves slightly mesially (or distally).

Active torque adjustments to the archwire do not therefore transmit force to the roots in the same manner as with conventional edgewise or preadjusted type brackets. However, it is this very "opening and closing" facility of the Tip-Edge archwire slot which makes possible an entirely new concept in third order torquing.

How Does It Work?

Side-Winder springs are fitted to the brackets in exactly the same way as when utilizing round base archwires. In fact, their mesiodistal tipping action is initially the same whether round or rectangular base wires are used. It is not until uprighting is almost complete that third order torque is induced, and then only if using a rectangular archwire.

The Side-Winder springs should be kept maximally active (passive lever arms approximately vertical) to obtain third order torque, even though uprighting may appear virtually complete. This ensures that the torque surfaces of the bracket are actively pressed into tight contact with the flat upper and lower surfaces of the rectangular wire. The teeth will automatically adopt a third order torque set according to the degrees of torque designed into the bracket base. Zero torque in the archwire will, therefore, produce the correct finishing specifications for the majority of cases.

However, where overbite reduction must be maintained by means of "bite opening sweeps," some torque adjustment in the incisor segment of the archwires may be necessary to restore zero torque as described on pages TE-38-39 of the TIP-EDGE GUIDE¹. However, in moderate to severe skeletal discrepancies where a normal inter-incisal angle may not be achievable, small adjustments may be made to the torque in the anterior segments to compensate. This is seldom more than 5°. Buccal segment torque is normally maintained at zero.

Major Advantages

The concept of torquing individual brackets to conform to a base arch by means of auxiliary springs rather than by flexing the archwire itself has several major advantages over other standard edgewise or preadjusted techniques:

Independent torquing — each tooth is torqued individually to its own prescription without unwanted torque reactions on adjacent teeth. This is because torquing is by Side-Winder springs without any changes in the torque set into the archwire.

Gentle — because torquing forces are so light (approximately half an ounce at a canine apex), it is impossible to cause root damage from excessive force. In the event of misdirection, root movement will simply stop.

Progressive — the torque force is constant until self limited by the bracket prescription. This is in contrast to archwire activated torque which tends to move the root in a series of small increments. In fact, with Tip-Edge all torquing can be accomplished on a single archwire without needing to remove it for adjustment.

Molar Control — is superior to any standard edgewise or preadjusted bracket system because the torque set in the archwire is not disturbed by any bracketed teeth. The base arch thus has an entirely passive function so that its torque values in the molar tubes remain undisturbed.

¹ Two-Swan Advertising, Westville, IN

No Canine Rotation When Closing Spaces With Tip-Edge Technique

Orthodontists using Tip-Edge brackets and the Differential Straight-Arch® or Tip-Edge technique do not have canine rotation problems when closing extraction spaces. This is because the force is not applied to the labial surfaces of the canines. Instead, pressure is applied at their contact points with the lateral incisors which are being moved lingually along with the central incisors by the archwire, Figure 1.

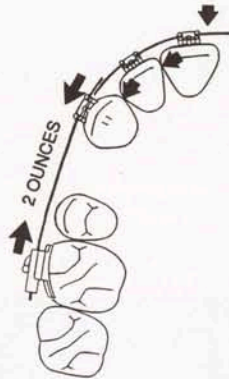


Figure 1. Two ounces of force on each side retracts the archwire. Distal pressure is applied to the center of the canine at its contact point with the lateral incisor. Therefore there is no tendency to rotate the canine during retraction.

Not only does the Tip-Edge technique solve the rotation problem, but also eliminates any friction between the brackets and the archwire. This is because the archwire is moving distally at the same speed as the teeth.

Lower Incisor Deep Groove

"Deep Groove" Tip-Edge brackets are now available for mandibular incisors for those patients whose treatment requires maximum torque control of the mandibular arch. These brackets incorporate a conventional preadjusted edgewise archwire slot which is cast into the bottom of the Tip-Edge archwire slot.



U.S. Pat. #4,842,512; #4,877,398 & 5,125,832 and For. Pat. Pend.

Figure 1. Mandibular right incisor Deep Groove Tip-Edge bracket (left) with cap removed (right).

During stage one and two a special cap fills the Deep Groove to ensure that a one point contact is maintained between archwire and slot to facilitate bite opening and retraction. At the Pre-stage three adjustment the cap is removed to allow engagement of either Torque Bars or rectangular archwires into the Deep Groove, Figure 1. This provides maximum torque control for final root

positioning during stage three or for braking mechanics during stage two. Nickel titanium Torque Bars are recommended for use with Deep Groove brackets.

To torque the mandibular incisor roots lingually, the bars are inserted in the same manner as they are usually engaged in the maxillary arch. With the auxiliary fully engaged and ligated into the Deep Grooves of the central incisor brackets under the main .022" archwire, the ends of the auxiliary will lay gingival to the lateral incisor brackets, Figure 2.

To torque the incisor roots labially the auxiliary should be inserted "upside down." When inserted in this manner, the ends of the auxiliary will lay incisal to the lateral incisor brackets when

Cont. on Pg. 4

CASE REPORT

A 15-year old female exhibited a dental Class II, Division 2 malocclusion. The mandibular molars had drifted mesially into a Class I relationship due to missing mandibular second premolars. The maxillary second premolars were extracted and treatment designed to move the mandibular anterior teeth toward the A-Po line to increase lower lip fullness.



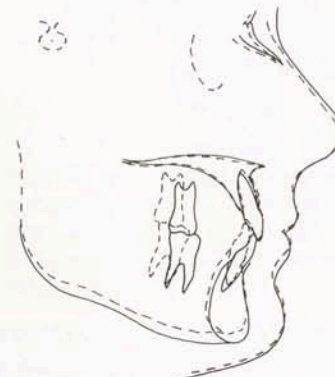
Place appliance appointment. Maxillary and mandibular .016" A. J. Wilcock stainless steel archwires with strong bite opening bends mesial to the molar tubes. Class II elastics (1.5 oz.) to reduce overbite and correct Class II canine relationship.



After bite opening and space closing procedures, stage three was begun with .022" archwires and a (30°-.016" x .022") nickel titanium Torque Bar. Side-Winder springs were placed on all teeth requiring mesiodistal uprighting.



Seven months later, after incisor torquing was complete, a .016" auxiliary was designed to provide lingual crown torque to the maxillary canine roots. Side-Winder springs still in place on selected teeth.



J.K. Female, 14 Years
Class II, Division 2
 Extractions U55, Missing: L55
 Archwires Used 4 (2U, 2L)
 Adjustments 14, Time: 18 Months
 Retention Maxillary Retainer,
 Mandibular Spring Aligner

Cephalometric Changes:

	Start - Dotted	Finish-Solid
1-APo	-2.0 mm	+1.0 mm
SN-MP	22.5°	20.5°
Wits	-1.0 mm	+1.0 mm
ANB	3.5°	2.0°
1-SN	98.0°	100.0°
SNA	86.5°	85.0°
SNB	83.0°	83.0°

Deep Groove

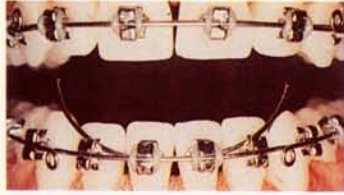


Figure 2. When torquing incisor roots **labially**, ends of Torque Bar lay incisal to lateral incisor brackets when fully engaged into central incisor Deep Grooves.

it is fully engaged into the central incisor archwire slots, Figure 3.

For maximum torquing action the auxiliary should extend through the canine archwire slots (with conventional edgewise appliances this auxiliary should end between the lateral and canine brackets). The Torque Bar can be shortened when active torque has been completed so that it ends distal to the laterals. This will establish the proper first order relationship between the lateral incisors and canines to facilitate final finishing. It is recommended that 20 or 30 degree Torque Bars be used for

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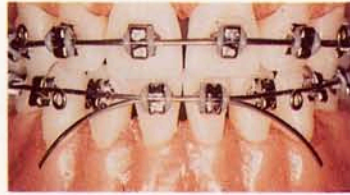


Figure 3. To torque mandibular incisor roots **lingually**, the ends of auxiliary should lay gingival to lateral incisor brackets.

active torque delivery while 0 degree Torque Bars are indicated for braking or stabilizing the lower incisors.

Torquing forces can also be applied with these brackets by leaving the caps in place and using passive, full-size rectangular archwires. Torque forces are generated by Side-Winder uprighting springs as presented in this month's cover story. The forces generated with this approach are lighter than those produced by Torque Bars and consequently may take longer to produce third order root repositioning.

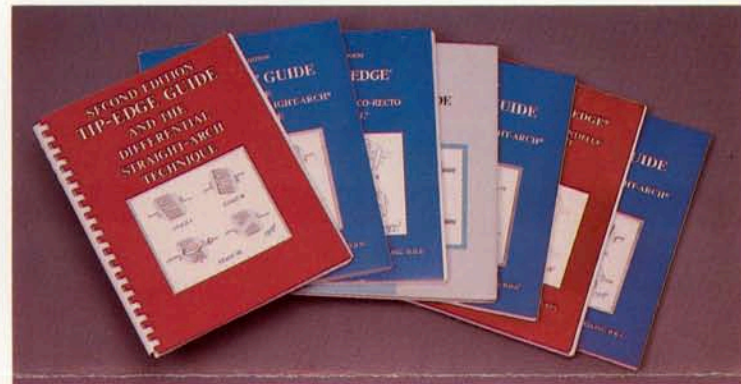
TIP-EDGE GUIDE Available in Seven Languages

With the recent publication of the Indonesian version of the TIP-EDGE GUIDE, this popular text is available in seven languages. Originally published in English in 1986, it has subsequently also been translated into French, Spanish, Italian, Portuguese and Japanese.

The TIP-EDGE GUIDE provides an in-depth description of the development and underlying concepts behind the Tip-Edge appliance and technique.

Most translations also contain chapters on attritional occlusion and the evolution of differential tooth movement under the guidance of its creator, P. R. Begg of Adelaide, South Australia and the Kesling & Rocke Orthodontic Group.

The latest (1992) revised edition of the English version of the TIP-EDGE GUIDE is available from TP Orthodontics.



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