

DR. CHRIS KESLING AND MR. IAN HAWTHORNE, CHAIRMAN 1993 BRITISH ORTHODONTIC CONFERENCE, DURING TIP-EDGE LECTURE IN GLASGOW (SEE PAGE 4).



# TIP-EDGE TODAY™

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DRS. THOMAS ROCKE AND RICHARD PARKHOUSE IN ADELAIDE, SOUTH AUSTRALIA DURING RECENT TIP-EDGE COURSE.

WINTER 1993-94  
**EDGELINES**

**LEVELING WITH TIP-EDGE:** A simple solution to leveling and canine retraction incorporates Tip-Edge brackets. Page 1.



**ENGAGING ROTATED MOLARS:** Use of a special sling tie provides an alternative to correcting molar rotations without compromising bite opening. Page 3.

**Rx III PRESCRIPTION:** Just what the doctor ordered for maxillary central and lateral incisors. Page 3.

**TIP-EDGE GRAPHIC**

**Bracket Sales Reflect Growing Popularity**

The number of Tip-Edge brackets sold has increased at the rate of 33% each year since 1987.



1987  
90,500  
Brackets Sold

1993  
500,000  
Brackets Sold\*

\*Based on projection of sales for first ten months of 1993.

## Incorporating Tip-Edge® Brackets To Facilitate Leveling And Aligning With Conventional Preadjusted Appliances: PART I

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*Dr. Fine is a consultant for TP Orthodontics, Inc.*

The preadjusted or "straight-wire" edgewise appliance is probably the most commonly used system in modern orthodontics. This is easy to understand since the convenience of preprogrammed in/out, torque and tip can significantly decrease the amount of wire bending necessary in a given case. With increased use of the preadjusted appliance, however, many practitioners began to notice side effects of treatment resulting from the factors built into this so called "easy" approach to edgewise treatment.



The in/out preadjustment has the fewest side effects, related primarily to tooth size and shape irregularities. The torque adjustment can lead to problems, primarily related to the inability of the preprogrammed torque values to satisfy the needs of all cases, particularly those with underlying skeletal disharmonies. Of course, torque difficulties do not arise until a rectangular wire is placed.

The tip preadjustment, however, is responsible for more dif-

ficulties than either of the other two preadjustments. The problems stem from the expression of final tip angulations with the very first archwire placed, regardless of its size. The tooth that is pivotal in this respect is the canine. As McLaughlin and Bennett<sup>1</sup> have noted: "Leveling and aligning is more difficult with preadjusted systems than with standard edgewise appliances. Evaluation of upper and lower canine position is the key factor in planning anchorage control in the sagittal plane."

When the canine crown is upright or distally angulated, several harmful side effects can be caused by wire engagement in a preadjusted system. The first side effect on adjacent teeth would be intrusion posteriorly and extrusion anteriorly, with resultant inadvertent bite closure, (Figure 1).

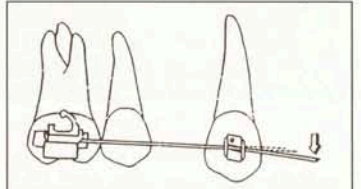


Figure 1. Initial wire engagement of the maxillary canine results in an extrusive effect on the incisors deepening the overbite.

If the overbite were deep to start, or if the practitioner had labored intensively to open the

bite, the resultant worsening of the anterior relationship would clearly be undesirable. Secondly, the complete engagement and expression of the initial archwire will cause uprighting of the canines and flaring of the incisors, (Figure 2).

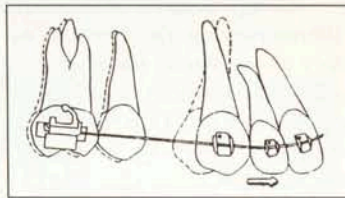


Figure 2. Initial archwire engagement of the canine results in mesial crown tipping and incisor flaring. Cinching the archwire produces a mesial force on the posterior teeth. Not cinching the archwire, on the other hand, permits space to open posteriorly.

If the wire is cinched, a mesial component of force is produced on the posterior teeth, with potential loss of anchorage. If the wire is not cinched, space could open.

Clearly, similar side effects can be seen when using a standard edgewise appliance, but are exaggerated when using a preadjusted appliance. The more tip built into the system, the more severe the inadvertent bite closure. For those using a rectangular wire early in treatment, a combination of side effects can occur. In this situa-

# Incorporating Tip-Edge

Cont. from Pg. 1

tion, flaring of the incisors and inadvertent bite closure occur simultaneously as both tip and torque are expressed.

Canine retraction also poses a problem with respect to inadvertent bite closure. If pure bodily retraction is not achieved, which is most often the case, the crown will tend to tip distally. Then the two-point contact within the preadjusted slot deflects the wire anterior to the canine occlusally, causing deepening of the overbite, (Figure 3).

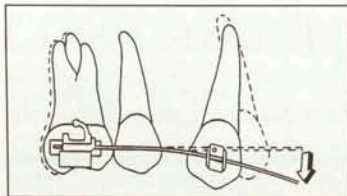


Figure 3. Canine retraction utilizing a preadjusted slot with a two-point contact causes overbite deepening. (Courtesy of Two-Swan Advertising)

## Compensatory Actions Are Necessary

Compensations or treatment alternatives are therefore necessary to counteract the undesired side effects arising from canine preadjustments. One could leave the brackets off the incisors, or the archwire disengaged, until the canine roots can be distalized, as suggested by McLaughlin and Bennett<sup>1</sup>. Or the canines could be retracted segmentally and uprighted before continuous archwire engagement. These methods, although viable, may often be impractical and prolong treatment.

## Tip-Edge Offers Simple Solution

A simple solution is achieved through the use of a one-point contact bracket during leveling and retraction, with subsequent two-point contact to express the prescription of the preadjusted system at the end of treatment. This describes the Tip-Edge archwire slot.<sup>2</sup> Regardless of wire size, pretreatment canine position or movements such as retraction, the wire anterior to the Tip-Edge bracket is never forced occlusally. This eliminates the problems of inadvertent bite closure and incisor flare, (Figure 4).

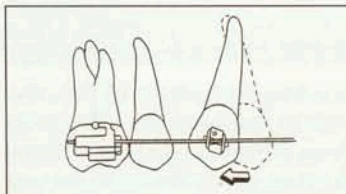


Figure 4. Leveling and canine retraction with the Tip-Edge bracket does not flex the wire avoiding inadvertent bite closure. (Courtesy Two-Swan Advertising)



Figure 6A-C. A) Replacement of canine bracket with Tip-Edge restores bite opening capability. B) After successful leveling and retraction, canine root is uprighted with spring. C) Finished case with canine angulation as per prescription.

## References

- McLaughlin RP, Bennett JC: Anchorage control during leveling and aligning with a preadjusted appliance system, *J Clin Orthod* 1991;25:687-696.
- Kesling PC. Dynamics of the Tip-Edge bracket. *Am J Orthod Dentofac Orthop* 1989;96:16-25.

More importantly, since this bracket is a modified preadjusted bracket, it is compatible with all preadjusted systems. Final canine position is achieved with an uprighting spring that is easier to place than a wire ligature.



Figure 5A&B. A) When disengaged from canine bracket slot archwire clearly has bite opening ability. B) Engagement in canine slot deflects archwire incisally which explains creation/maintenance of deep bite.

Consider the case outlined in Figure 5. After some months in treatment, it was unclear why the bite was not opening. Clearly, the wire had bite opening capabilities (Figure 5A), however, the canine was tipped distally, partly due to retraction. When the wire was engaged into the canine bracket, it was displaced occlusally, both creating and maintaining the deep overbite, (Figure 5B). When the canine bracket was switched to a

Tip-Edge bracket (Figure 6A), the wire could easily express its bite opening capabilities, and the canine could be retracted without anterior side effects. An uprighting spring achieved final canine root position (Figure 6B), and a



favorable end result was achieved (Figure 6C).

Tip-Edge brackets simplify the needs of the practitioner by eliminating certain significant side effects of treatment due to typical edgewise two-point contact mechanics. Therefore, Tip-Edge brackets, as an integral part of a preadjusted appliance, may represent the next generation in "straight wire" techniques. ☛



## Q's and A's

**Q.** I am considering switching to Tip-Edge brackets but have been using brackets with .018" slots. Why are Tip-Edge brackets only available with .022" slots? I am afraid of the high forces associated with larger archwires.

TUCSON, ARIZONA

**A.** You are in for a pleasant surprise. The force values applied to the teeth from .022" x .028" archwires in Tip-Edge archwire slots are LESS than that from .018" x .025" archwires in conventional .018" archwire slots. It all has to do with the unique design of the Tip-Edge archwire slot which, in effect, gets larger during initial tooth movement. Yet in conjunction with a Side-Winder spring, it provides 5 to 6 degrees more final torque control than an ordinary preadjusted slot.

**Q.** Can we use a reverse headgear to mesialize the maxillary arch "en masse" in a high angle case, instead of Class III, 2 oz. elastics that could cause slight eruption of anchor molars?

MANILA, PHILIPPINES

**A.** Reverse headgears have been shown to cause maxillary molars to drop as the maxilla moves forward with a "hinge-like" motion. There

would be far less chance of erupting maxillary molars from wearing light Class III elastics.

**Q.** When using differential tooth movement, what is the maximum anteroposterior discrepancy that can be successfully treated without surgery in a nongrowing patient?

KANSAS CITY, KANSAS

**A.** It was recently demonstrated\* that a Wits of -20.0 mm (Class III) could be reduced to a -5.0 mm through extraction of the first premolars and treatment with differential tooth movement. At the same meeting a Wits of +15.0 mm (Class II) was reduced to +5.0 mm by the extraction of the first molars and first premolars in the maxillary arch and the mandibular first premolars†.

Both cases while extreme, resulted in satisfactory occlusions and soft tissue profiles. In general Wits discrepancies of plus or minus 10.0 mm can be successfully treated without surgery by differential tooth movement and appropriate compensations to normal incisal angulations to both SN and MP.

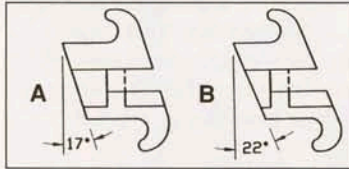
\*Paper entitled "Linear Discrepancies" by Dr. Yoshihiro Arima presented at 1993 NASSO meeting in Florida.  
†Case Report — Dr. Howard Peterson Award Winner" presented by Dr. Morton Speck.

# Rx III Brackets Available

TP Orthodontics recently introduced Rx III brackets for the maxillary central and lateral incisors. High torque values are built into the bracket bases that are appropriate for nonsurgical, Class III treatment: maxillary central incisors +22 degrees and maxillary lateral incisors +17 degrees. The original brackets for these teeth (Tip-Edge Rx 1) have values built into their bases that are compatible with Class I skeletal base occlusions: maxillary central incisors +12 degrees and maxillary lateral incisors +8 degrees.

These new Rx III brackets which also have Deep Grooves would be indicated when it is planned to finish treatment of Class III, nonsurgical cases with full-size .022" x .028" archwires. It will then be possible to leave (or place) the maxillary incisors in "over-torqued" angulations to help compensate for skeletal base discrepancies.

Of course, if orthognathic surgery is part of the treatment



High torque, Rx III maxillary anterior brackets. A. Lateral incisor +17°. B. Central incisor +22°. Dotted line indicates junction between Deep Groove and Tip-Edge archwire slot.

plan for severe Class III cases, then the torque values of Rx 1 brackets should be appropriate for the maxillary incisors.

If a rectangular archwire is to be used in the mandibular arch in Class III skeletal discrepancies (treated nonsurgically) it will be necessary to place a slight third order offset in the incisal area to provide the necessary slight, lingual crown inclinations.

Rx III high torque brackets may also be indicated in any case where accentuated root torque is

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# Initial Engagement of Severely Rotated Molars

Engaging .016" Australian archwires into rotated molars at the start of treatment can be difficult, even impossible, if the molars are severely rotated (Figure 1).

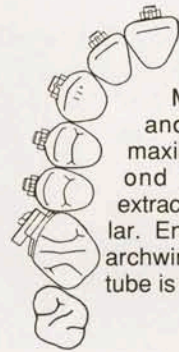


Figure 1. Mesial drifting and rotation of maxillary right second molar after extraction of first molar. Engagement of archwire into molar tube is not possible.

One way to correct such molar rotations is to use initial nickel titanium or coaxial archwires to align the molars. However, this may prolong treatment by several appointments since bite opening is delayed.

The use of a special sling tie provides an alternative means of correcting molar rotations without compromising bite opening. A thin steel ligature (.011") tie is doubled over and crimped sharply in the middle so that it can be slipped through the molar tube from the mesial or distal. After the doubled over end of the ligature tie slips out through the opening at the other end of the molar tube it is opened to form a small loop (Figure 2).

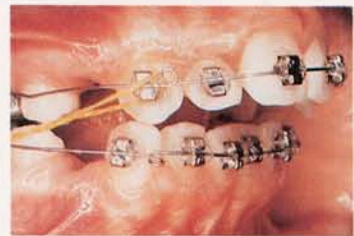


Figure 2. Doubled over end of steel ligature tie (.011") is inserted from distal end of tube on rotated molar. Loop protruding from mesial of tube is opened to accept end of archwire.

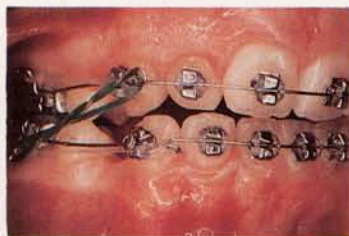
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## CASE REPORT

The patient, a 14 year old female, exhibited a severe skeletal Class II, Division 1 malocclusion. With a Wits of +7 mm and an ANB of +11.5, it was considered a maximum anchorage case. The case was further complicated by a high mandibular plane angle (SN-MP 36.5°) and an anterior openbite. Four first premolars were extracted.



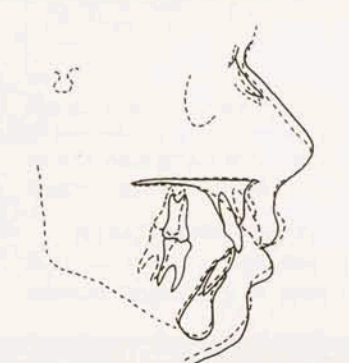
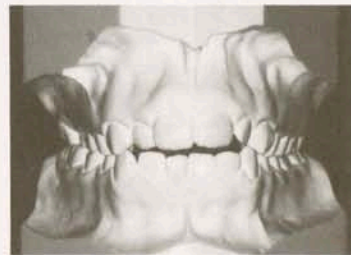
Initial archwires of .016" Wilcock wire with strong maxillary and mild mandibular bite opening bends. Light (1.5 oz.) Class II elastics.



Overjet reduced with anchorage well preserved. E-Links® closing posterior spaces and Side-Winder springs acting as brakes on canines.



Round .022" archwires permit compensation for severe skeletal discrepancy. Nickel titanium Torque Bar (30°) and Side-Winder springs upright teeth. No extraoral force used throughout treatment.



R.H. .... Female, 14 Years  
**Class II, Division 1**  
 Extractions ..... U44, L44  
 Archwires Used ..... 4 (2U, 2L)  
 Adjustments ..... 20, Time: 30 Months  
 Retention ..... Maxillary Retainer  
 Mandibular Spring Aligner

**Cephalometric Changes:**

	Start - Dotted	Finish-Solid
1-APo	0 mm	+1.5 mm
Wits	+7.0 mm	+5.0 mm
SN-MP	36.5°	36.0°
ANB	11.5°	8.0°
SNB	75.5°	75.0°
SNA	87.0°	83.0°
1-SN	103.0°	95.0°

## Initial

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The end of the archwire is then inserted through the loop formed by the ligature tie at one end of the tube while the two free ends of the tie coming out the other end are twisted tightly around the wire using ligature tying pliers (Figure 3).



Figure 3. End of archwire is threaded through ligature loop at mesial of tube. Free ends of ligature tie are crossed over end of wire and twisted tightly.

This draws the archwire tightly against the buccal surface of the molar tube. The end is then bent around to prevent it from slipping out of the sling tie. Desired molar rotation will begin simultaneously with bite opening. Usually the archwire can be engaged into the molar tube in one or two appointments.

## Rx III

Cont. from Pg. 3

desired and rectangular archwires are to be used for final finishing.

Of course, if .022" round archwires are to be used to complete treatment of any case re-

gardless of anteroposterior skeletal discrepancy, there is no reason to consider the torque built into the bases of either the maxillary or mandibular brackets.

## Tip-Edge In Japan



A three-day Tip-Edge course in Tokyo, Japan, was given in July by Dr. Thomas Rocke. The course was limited to instructors in orthodontics. Twenty-six orthodontic departments and five medical schools were represented by the forty-two participants.

Dr. Kunicki Miyajima, Professor of Orthodontics at Aichi-Gakuin University, Nagoya, Japan, acted as interpreter.

Dr. Rocke also presented an all day lecture to 140 Japanese orthodontists who were interested in learning more about Tip-Edge.

## Tip-Edge In Scotland

Dr. Chris Kesling recently gave an Advanced Tip-Edge Course in conjunction with the British Orthodontic Conference in Glasgow, Scotland. He also presented a paper to 550 orthodontists on the development and use of the appliance.

Mr. Sisiera Weerakone and Mr. John White demonstrated their new hypertext tutorial program. It covers both the philosophy behind and use of the appliance. Active video segments plus narration can be viewed on personal computer screens.



Mr. Keith Pearson and Dr. Chris Kesling observe Mr. Sisiera Weerakone and Mr. John White demonstrate new video-based, hypertext Tip-Edge program.

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