DR. CHRIS KESLING (CENTER) WITH GROUP OF PROFESSORS FROM THE UNIVERSITY OF BRESCIA IN ITALY WHO WERE PARTICIPATING IN A TIP-EDGE COURSE, PAGE 3.

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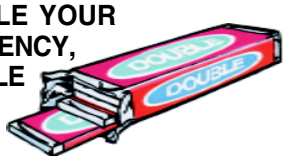
WINTER 1999-2000

EDGELINES

MAY THE POWER BE WITH YOU

Each stage of treatment has its own unique source of power, Cover Story.

DOUBLE YOUR EFFICIENCY, DOUBLE YOUR FUN



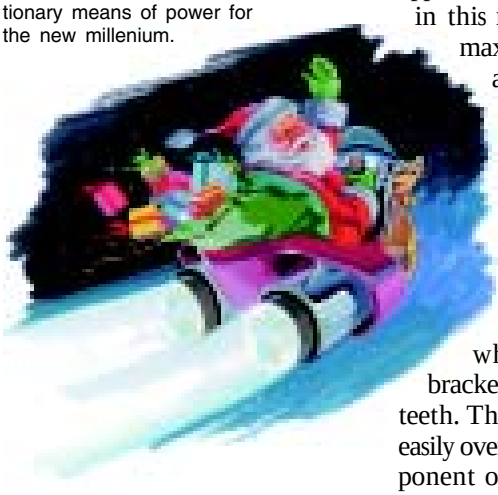
Technique tip solves two problems in one, Page 3.

DOWN UNDER COURSE

Second Tip-Edge course conducted in Adelaide, South Australia, Page 4.

TIP-EDGE GRAPHIC

Santa chooses a revolutionary means of power for the new millenium.



COVER STORY

Unique Power Sources for Each Stage Promote Comfort, Speed and Stability

By Peter C. Kesling, D.D.S., Sc.D.

Major Power Sources Vary With Stages

The prime source of tooth moving forces in the Differential Straight-Arch® Technique varies with each stage of treatment, Figure 1. This unique separation of power sources helps ensure the advantages of differential tooth movement. It promotes patient comfort, enhances rapid tooth movement and provides maximum stability.

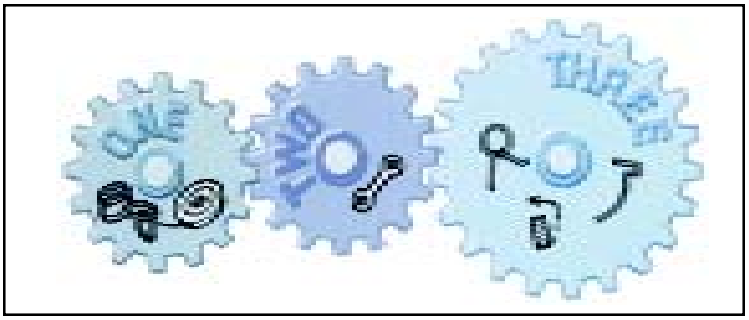


Figure 1. Primary power sources differ for each stage of treatment of an extraction case. Note each stage has unique sources of tooth moving force; stage one = archwires and elastics, stage two = horizontal elastomerics and stage three = auxiliaries.

Stage One—Two Main Power Sources

A. Flexed Archwires

Forces derived by flexing the archwires are major movers of teeth only at the beginning of treatment. The Differential Straight-Arch Technique is unique among all fixed appliance orthodontic techniques in this respect. This results in maximum patient comfort as these are the smallest of archwires and, therefore, deliver the lightest of forces.

The vertically deflected anterior portions of .016″, high tensile starting archwires generate intrusive forces when engaged in the brackets of the six anterior teeth. These forces of 2-3 ounces easily overcome the vertical component of force pull from light, 2-3 ounce, Class II or III elastics. The remaining force of 1-2 ounces is sufficient for intrusion or otherwise control the anterior vertical dimension.

The distal ends of the archwires reciprocate by keeping the anchor molars upright and tend to cause their slight elevation. This temporary aspect of bite opening helps unlock cuspal interferences making possible early Class II or III correction. In selected cases vertical loops in these stage one, .016″ archwires can be used to power the creation of space and alignment of crowded anterior teeth. The relatively long loops result in light, continuous forces for maximum comfort and rate of tooth movement.

B. Intermaxillary Elastics

Obviously from the above, archwires are not the *only* dominant source of tooth moving forces during stage one. Intermaxillary elastics are also essential to correct anteroposterior discrepancies and open deep anterior bites. However, they are co-dependent with the archwires and unless applied simultaneously and with the proper degree of net *imbalance* on the anterior portion of the archwire, treatment will be in a state of static chaos.

The Tip-Edge archwire slots automatically instigate differential tooth movement between the two arches during intermaxillary elastic traction. The teeth in one arch tend to tip distally while those in the other are held upright necessitating bodily movement. This results in the rapid retraction of one dental arch and maximum anchorage in the other.

Since the archwires are delivering forces 24 hours a day, the elastic forces must also be continuously present. Rapid progress

Please see COVER STORY next page

COVER STORY

Unique Power Sources . . . *Continued from page 1*

in treatment during stage one is the ultimate indicator of patient cooperation with intermaxillary elastic wear.

Of course, archwires and intermaxillary elastics continue to be an integral part of treatment after stage one. However, they are then not employed to provide force to move teeth, but rather just the opposite—to resist change and provide stability.

Optional, secondary power sources during stage one could be anterior elastomerics, rotating springs, posterior cross elastics or elastic thread. However, none of these are essential to the main objective of establishing normal anterior tooth relationships.

Contraindicated forces would be those from posterior, intramaxillary elastomerics and extraoral anchorage.

Stage Two—Elastomerics Main Power Source

During stage two, the posterior space closing phase, the main tooth moving forces are generated by horizontal, fixed elastomerics—or changeable elastics. At this point the proper anterior tooth relationships have already been established through archwire and intermaxillary elastic forces. The archwires become larger in cross-section (.022″ or .0215″ x .028″), and serve mainly as retainers or stabilizers to provide maximum vertical and horizontal stability during posterior space closure and detailed finishing.

Anchor molars (if elevated during bite opening) begin to settle and by the end of treatment will be at pretreatment levels. In other words, the mandibular plane angle will not be increased by their eruption. Of course, during treatment in growing patients, the levels of *all* teeth in both arches will tend to move away from their benchmarks–the palate or mandibular border, by their natural, continual vertical eruption.

Also of note is the lack of tooth movement from Class II or III intermaxillary elastics. Their presence is, of course, very real. However, their purpose and function is strictly the maintenance of prior changes—stability.

Optional power sources during stage two could be rotating or Side-Winder springs and an occasional return to a .016″ archwire to elevate premolars. Extraoral force remains contraindicated as it can loosen anchor molars and is an unnecessary inconvenience to the patient.

Stage Three—Auxiliaries Main Power Source

All tooth movements in stage three, which in extraction cases often lasts as long as stages one and two together, are powered completely by auxiliaries. When set up properly in terms of both tooth positions and the placement of auxiliaries, there is little, if anything, for the orthodontist to do for the remainder of treatment. All teeth will automatically be uprighted and torqued to their desired angulations as determined by the angular preadjustments built into the Tip-Edge archwire slots and bracket bases.

The most common auxiliaries are the Side-Winder springs designed to move the roots either mesially or distally. In conjunction with the Tip-Edge archwire slot and a passive .0215″ x .028″ archwire, a Side-Winder spring can also torque the root of a tooth palatally or labially. This torquing occurs automatically when required without any deductive thought or specific effort by the operator.

Torquing and uprighting forces from the Side-Winder springs remain nearly constant from start to finish. If such forces were derived from flexing archwires, even those of nickel titanium, they rapidly decrease to zero. This means the achievement of the final degrees of torque and tip is delayed due to a rapidly dissipating power base.

Archwires and intermaxillary elastics (if needed) continue as in stage two to function as stabilizers and maintain arch form, the vertical dimension and a Class I interdental relationship.

Other auxiliaries used to torque the roots include the Torque Bar of nickel titanium, the Individual Root Torquing auxiliary and a two or four spur auxiliary. Unlike torquing and uprighting with a Side-Winder spring, these auxiliaries are not self-limiting and the forces delivered decay relatively rapidly as the teeth torque.

Extraoral force continues to be contraindicated while the .0215″ x .028″ archwires offer the option of torquing the molars. Even though these stainless steel archwires are full size, the torquing forces delivered are the lightest because they are generated along the full length of the archwire—not just between premolars and molars.

Q's and A's

Q. *What are the indications for extracting maxillary or mandibular first permanent molars to aid in the treatment of Class II or III malocclusions?*

Enfield, Connecticut

A. Adult patients with severe Class II or III skeletal malocclusions should cause the experienced Tip-Edge operator to immediately consider uni-arch, first molar extractions as a treatment plan. Of course, the maxillary first molars would be removed in a Class II malocclusion and the mandibular first molars in a Class III malocclusion. The largest obstacles to arriving at such a treatment plan are often the absence of third molars and sometimes the preconceived notion of the family dentist that first molars are sacred and should never be removed. However, when properly explained to the patient, such treatment plans are usually readily accepted as a means to achieving a satisfactory occlusion and avoiding the prospects of orthognathic surgery. Treatment times are quite often eighteen months, or less.

Q. *On several occasions I have used Side-Winder springs to power tip the mandibular canines, but spaces developed mesial to the canines—even with elastomeric cuspid ties. What can I do to prevent this spacing?*

Chicago, Illinois

A. Slight spaces may have been present between the anterior teeth with the cuspid circles touching the canine brackets. If this were the case, the space would tend to localize mesial to the canine crowns as they tip distally. The solution is to roll the circles toward one another and close with an E-Link® from canine to canine with the Side-Winders in place.

Q. *I have been having trouble getting my crimpable hooks to stay in place on the .0215″ x .028″ archwires. I thought it might be the pliers. However, even with new pliers I have the same problem. I am crimping the hooks in the mouth. What can I do?*

East Brunswick, New Jersey

A. It is recommended that the hooks be lightly crimped on the archwire in the mouth for proper position. Then the wire is carefully removed so as not to slide the hooks, and the serious crimping is done outside the mouth. The pliers should be closed on the hooks with as much force as possible—as if one were trying to break the handles. If this much pressure were applied intraorally, it could be uncomfortable for the patient and/or dislodge some brackets.

Technique Tip—Two-In-One

Two means of simplifying treatment are disclosed in this patient's records. The original malocclusion was a Class II with moderate anterior crowding, Figure 1.

Figure 1. Original malocclusion.

The treatment plan was nonextraction and was initiated before the complete eruption of the maxillary right canine.

Treatment began with .016″ high tensile archwires with strong anchor bends mesial to the anchor molars. A section of Bump-R-Sleeve® (.028″ I.D.) was placed to maintain space for the unerupted maxillary canine, Figure 2A. Note what appears to be a short metal tube between the mesial end of the plastic Bump-R-Sleeve and the intermaxillary circle. This is actually a Crimpable Stop (TP 226-009) that was crimped around the wire. It serves as a rigid stop to prevent the flexible Bump-R-Sleeve from moving into the cuspid circle.

Six months later the anterior bite was opened, the Class II relationship corrected to a Class I and the maxillary right canine had erupted enough to allow direct bracketing. However, the bracket is too far gingival to allow engagement of the archwire into the slot.

An elastomeric ligature was threaded over the end of the archwire, Figure 2B. It was then used as a resilient sling over the gingival wing of the canine bracket, Figure 2C. Six weeks later the sling ligature was still in place and the canine had erupted to the proper level to permit normal archwire engagement and ligation, Figure 2D.

These two tips eliminate the need to fashion a molar stop in the maxillary archwire and the use of box loops or a nickel titanium auxiliary to erupt the maxillary canine.

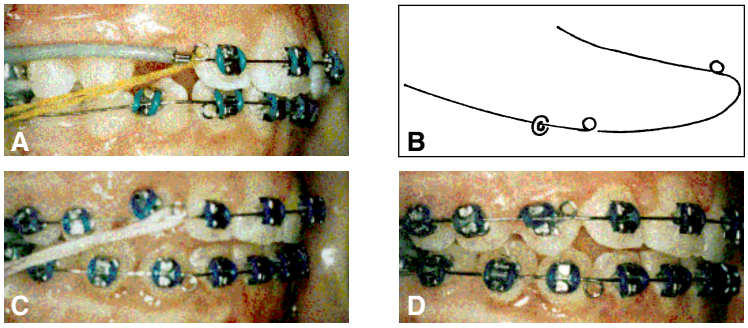


Figure 2 A-D. A) Crimpable stop holds Bump-R-Sleeve distal to canine circle. **B)** Elastomeric ligature is threaded over the archwire. **C)** Ligature is used as a sling to canine bracket. **D)** Sling ligature (still in place) has erupted canine to proper level for engagement on archwire.

Orthodontic Graduate Students Visit Center For Three-Day Course

Thirty-seven graduate students and faculty members took a Tip-Edge course at the Orthodontic Center in Westville, Indiana, September 30th-October 2nd.

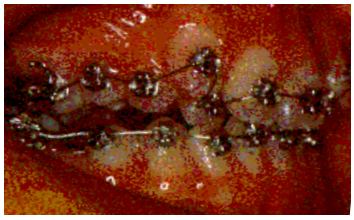
Their programs all teach Tip-Edge in their orthodontic curriculum. Universities present were Case Western Reserve University, Saint Louis University, University of Missouri, University of New York at Buffalo and the University of Western Ontario.

Also attending this course were Doctors Vasco Sabatiello, Stefano Bonetti, Ingrid Toni and Dario Rossi from the University of Brescia, Italy.

CASE REPORT

By: Dr. Yoshitsura Sawa
Yamaguchi Ken, JAPAN

The patient, an 11-year, 5-month-old female, presented with a Class I occlusion, severe maxillary anterior crowding and a right molar crossbite. A nonextraction treatment was planned as the second molars have not erupted and the profile is balanced.

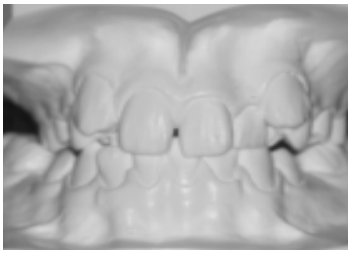


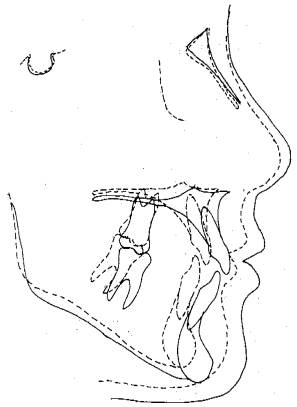
Place appliance appointment. Maxillary archwire is .014″ nickel titanium. Mandibular archwire is .016″, high tensile steel with coil springs to create space for the unerupted second premolars. No intermaxillary elastics.

Rectangular archwires. First, .017″ x .025″ and finally, .021″ x .025″ were used in stage two for stability and to expand the maxillary arch.

Stage three began after thirteen months of treatment. Archwires of .0215″ x .028″ stainless steel were used to retain arch form and resist reciprocal forces from Side-Winder springs.

(Editor's Note: Normally elastics worn during stage three are TP green or blue; also inversion of Tip-Edge bracket on the maxillary right lateral incisor would have resulted in more labial root torque.)





K.Y. ..... Female, 11 Years, 5 Months
Nonextraction
Archwires Used 10 (5U, 5L)
Treatment Time ..... 24 Months
Retention ..... Prefinisher

Cephalometric Changes:

	Start-Dotted	Finish-Solid
1 A-Po	–3.0 mm	0.0 mm
Wits	–10.0 mm	–5.0 mm
SN-MP	40.0°	25.0°
SNA	79.0°	82.0°
SNB	74.0°	77.0°
ANB	5.0°	5.0°
1-SN	93.0°	97.0°

Boston University Students Enjoy Tip-Edge and Sailing Outing

In the summer of 1999 six, second year graduate orthodontic students of Boston University spent a day with their Tip-Edge instructor, Dr. Robert Rozene of Hyannis, Massachusetts.

The day began with a light breakfast at Dr. Rozene's office followed by the examination of patients under treatment from 9 A.M. to 1 P.M. All aspects of Tip-Edge through early recall, all the stages and into posttreatment retention were represented.

The group then traveled to Dr. Rozene's home for a barbecue lunch and an afternoon of sailing. This outing has become an annual event for the Boston students. During the year Dr. Rozene shares the pre- and posttreatment records of his own patients with the students during his periodic visits to the University.

Dr. Robert Rozene (center) and the second year orthodontic graduate students from Boston University. A morning of Tip-Edge is followed by an afternoon of sailing.

Second Tip-Edge Course In Adelaide, South Australia

In July of 1999 the second Tip-Edge course conducted by the Australian Begg Orthodontic Society was held in conjunction with the Korean Orthodontic Research Institute (KORI). Eighteen of the participants were from South Korea. The course was comprised of both lectures and typodont instruction.

Instructors included Dr. Wayne Sampson (P.R. Begg Chair in Orthodontics) and Drs. Craig Dreyer, John Jenner and Colin Twelftree. Organizational help was provided by Professor Kim, Il-Bong, Chairman of KORI.

Students and faculty (interspersed) of the second Tip-Edge course in Adelaide, South Australia, July 1999.

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