

Multifunctional Archwire for Bite Opening, Torque

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Efficient orthodontists like mechanics that are impactful. No archwire has made a bigger impact on effective treatment than preformed Reverse Curve TMA with "T" Loops. Although this archwire has been around for a while, its influence on solving certain treatment problems is more significant than ever. It would be good to revisit its use and multiple functions.

Let's take a look at the problems this archwire is designed to solve. It's common to have the lower arch completely leveled, the upper buccal segments in a Class I, and still have a latent deep bite with spaces mesial to the upper cuspids (Figure 1). The solution is to open the bite in order to close the space. The principle in orthodontics that addresses this problem is commonly referred to as "reduce the overbite before resolving the overjet." By honoring this principle, we close anterior spaces without compromising the buccal segment interdigitation or jamming the lower incisors.

But what if you could close the space and open the bite at the same time? Even better, what if you could actively increase torque with the same wire? Better yet, what if you could increase torque while the archwire is already in place? Sound too good to be true? Well then, let me reintroduce you to the Reverse Curve TMA with "T" Loops, the versatile answer to these treatment challenges.

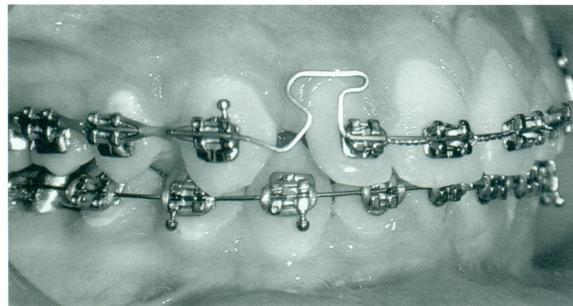


Figure 1. The "T" Loop is commonly used when the lower arch has leveled, the upper buccal segment is in a Class I, yet there's still a latent deep bite with spaces mesial to the upper cuspids.



Figure 2. The distal extension of the "T" Loop is about one third longer than the mesial.



Dr. Jim Hilgers focuses on ideas that can be used in any practice, regardless of size or therapeutic bias. He holds numerous patents with inventions on display at the Smithsonian and received a gold medal for an educational CD from the New York Film Festival. Dr. Hilgers received his D.D.S. from Loyola and his M.S. and certificate in orthodontics from Northwestern. He has been in private practice in Mission Viejo, California, for 30 years, written over 80 journal articles and lectures internationally.

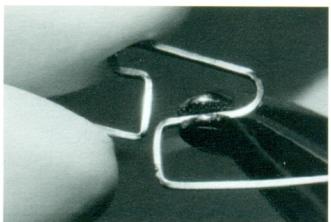
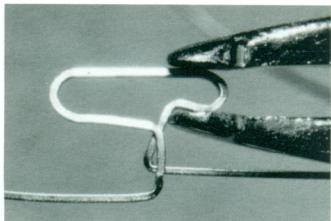
Preplacement Archwire Activation

The "T" Loop in the TMA archwire could be more accurately described as an asymmetrical "T" loop because the distal extension of the loop is about one third longer than the mesial (Figure 2). It's this asymmetrical design that allows the clinician to create a step-up from the cuspids to the incisors, effectively treating them as individual segments. The archwire comes in three different sizes: .016 x .022 (.018 slot), .017 x .025 (.018 or .022 slot) and .019 x .025 (.022 slot). It's available with six different anterior lengths, measured from the distal of the upper lateral incisors. Its exaggerated curve of Spee acts to extrude and seat the buccal segment while aiding the intrusion of the upper incisors.

After selecting the appropriate archwire size, activate the "T" Loop by pinching the anterior portion of the loop closed (Figure 3a) and opening the distal extension of the loop (Figure 3b). This creates a step-up in the archwire from its anterior to posterior components from 1 to 5 mm, depending on the bite opening you desire (Figure 3c). The step-up between the cuspids and the incisors is transitory and serves the functional purpose of allowing the bite opening and simultaneous space closure, while avoiding the upper and lower incisor contact that would compromise movement. Once the movement is complete, the incisors are re-engaged to achieve a functional (3 mm) overbite, taking the *elongated look* out of the cuspids.

The preformed archwire also has an exaggerated rotation in the upper molar region, helping to main-

and Space Closure



Figures 3a – c. Activate the "T" Loop by pinching the anterior portion of the loop closed and opening the distal extension. A step-up is created in the archwire from its anterior to posterior components.

tain proper molar rotation while the upper incisors are being retracted. Using a contouring plier you can also curve the distal of the archwire slightly outward to allow easier insertion into pre-rotated molar tubes (Figure 4).

Archwire Placement

Fit the archwire into the molar tubes, engaging it first in the anterior segment, and then seat the buccal segment of the archwire into the brackets in the segment to compress the "T" Loop, which will then resemble its

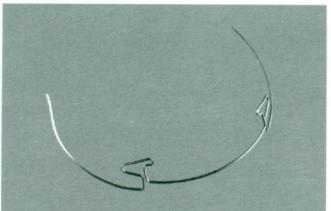


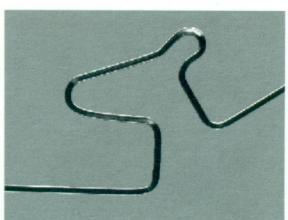
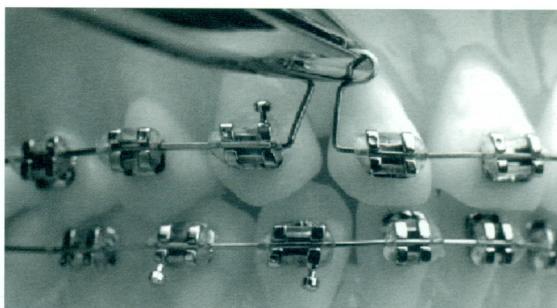
Figure 4. Curve the distal end of the archwire slightly outward with a contouring plier to allow easier insertion into pre-rotated molar tubes.

preactivated shape. Activate the closing function of the archwire by pulling its distal extension through the molar tubes, bending it upward, then clip off this end of the archwire, removing its previously outward-contoured portion. The vertical legs of the "T" Loop are usually activated about 2 mm to initiate the closing activity of the wire, although it's not uncommon to wait a month for bite opening to occur before activating the horizontal or closing component of the "T" Loop.

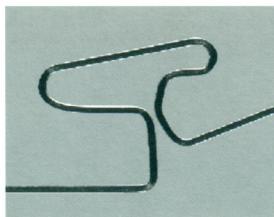
Intraoral Torque Adjustments

A unique advantage of the Reverse Curve TMA with "T" Loops is that torque in the anterior segment can be enhanced *while the archwire is completely engaged*. This can be accomplished in two ways. First, you can pinch the horizontal portion at the top of the "T" Loop using a small optical plier (Figure 5a) to place a gabling torque of up to 30° in the anterior portion of the wire. The drawback, however, is that it also opens the base of the loop, diminishing its capacity to close anterior spaces (Figure 5b). This is beneficial when you wish to advance the upper incisors (Class II, division 2) and can even be used as the initial archwire to accomplish this objective.

The second more prudent, and yet just as effective, method of enhancing torque is to pinch the anterior



Figures 5a – b. Enhance torque in the anterior segment by pinching the horizontal portion at the top of the "T" Loop using a small optical plier to advance the upper incisors. However, this will also open the base of the loop, which can diminish its capacity to close anterior spaces.



Figures 6a – b. Another method of enhancing torque is to pinch the anterior vertical leg of the "T" Loop to allow full expression of the loop for space closure.

vertical leg of the "T" Loop (Figure 6a) to allow the full expression of the "T" Loop for space closure (Figure 6b). This approach for enhancing anterior torque is especially useful when using clear or ceramic brackets because it helps avoid the bracket fractures that can occur when placing active torque in the archwire.

Multifunctional Archwire Performance

Movement of the teeth to open the bite and close anterior spaces is extraordinarily rapid (see case). A complete 8 to 10 mm overbite can often be reduced in two to three months. This will allow the upper incisors to be brought into an end-to-end overbite correction. It's important to mention again that the purpose is to close anterior spaces without impinging on the lower

incisors (or their brackets), which would effectively compromise the closing moment of the archwire. Once the proper space closure and torque control of the upper incisors has been achieved, it's usual to place a flexible type of archwire in the upper arch to finish the detailing prior to appliance removal.

My favorite wire for the finishing phase is the .016 x .022 (.018 slot) or .019 x .025 (.022 slot) Force 9® archwire. The Force 9 is a flexible, nine-strand braided superelastic archwire that can receive bends for detailing and yet is good for maintaining torque control and arch form. It's also possible to use light, round wires for this same purpose when torque control isn't an issue and when it's advantageous to roll the upper teeth into a seated occlusion using vertical seating elastics. The clinician should always ligate upper cuspid to cuspid during this idealization period to avoid space opening in the upper arch as the two arches are *squeezed* together.

No other archwire in my armamentarium receives as much use as the Reverse Curve TMA with "T" Loops. The wire works equally well in extraction or nonextraction cases and serves to open the bite, close anterior spaces and increase torque simultaneously. This multifunctional archwire uses high technology to solve some age-old dilemmas. **ci**

CASE

12-year-old female at 10 months into treatment for Class II correction. The .016 x .022 Ni-Ti archwire was replaced with an .016 x .022 Reverse Curve TMA with "T" Loop archwire to correct an 8 mm overbite. After one month, we see a one-half overbite correction and at two months it's ideal. The patient wore the "T" Loop archwire for three months. After debonding, the patient's final anterior occlusion shows a proper 3 mm overbite.

