

The Begg's uprighting spring – Revisited

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ABSTRACT

Uprighting springs, an integral part of the Begg light wire differential force technique is gaining more and more popularity, as a useful adjunct in contemporary preadjusted edgewise appliance systems as well. It can be used with brackets containing vertical slots for mesiodistal crown uprighting, or as bracing auxiliaries providing additional anchorage while protracting posteriors. Here, we present a simple and quick chair side method of fabricating and customizing uprighting springs according to the required crown/root movement for correction. This communication would serve as a ready reckoner during fabrication of the springs, thus dispelling the confusion that usually arises regarding direction and position of the coil and active arm.

Key words: Bracing mechanics, reinforced anchorage, root uprighting

INTRODUCTION

Uprighting springs or mesiodistal root uprighting springs are an indispensable component of light wire differential force technique, introduced by Begg in 1956.^[1] Besides being used for mesiodistal root uprighting during Stage III of Begg's Technique,^[1] they are also used as bracing auxiliaries to increase the anchorage to carry out various tooth movements.^[1-3] However, with the advent of the preadjusted edgewise appliance, the use of light wire technique has drastically reduced resulting in a lack of familiarization of the Begg uprighting spring among contemporary orthodontists. Of late, the various possibilities of this spring as an adjunctive in contemporary preadjusted edgewise appliance systems containing vertical slot is being explored. The additional anchorage potential provided by uprighting springs can be used to treat different situations successfully (e.g. space closure by posterior teeth protraction).^[3] These springs are made from 0.009" to 0.018" Australian archwire depending upon the type of tooth (i.e. incisors, canines, premolars and molars) and the purpose (e.g. mesiodistal uprighting or as brakes to provide additional anchorage) for which we need to use these auxiliaries.^[4] Although these uprighting springs are easily available in prefabricated form, here we present a simple and quick chair side method to fabricate and customize uprighting springs according to the required crown/root movement for correction.

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STEPS IN FABRICATION

1. Determine the type of moment (clockwise or counterclockwise), required for mesiodistal root uprighting either clinically or with the help of OPG. This will vary depending upon tooth type and quadrant of the arch under consideration in the maxilla or mandible.
2. Figure 1, represents a situation, where upper right 2nd premolar needs clockwise moment for root uprighting.
3. Hold approximately 6 cm of Australian arch wire, as shown in Figure 1a, and bend the right plank of the wire in a clockwise direction. Then, the wire is bent around beak of 139 pliers keeping this end under the left plank [Figure 1b]. Make the coil with two and half turns [Figure 1c]. Figure 1d completes the residual wire bending as per requirement of the degree of activation.

Optimum angulation is 135° between arm and stem of uprighting spring. For anchorage reinforcement, minimum to moderate degree of activation is sufficient. This will also minimize side effects on adjacent teeth.

4. Figure 2, represents a situation, where lower right 2nd premolar needs anticlockwise moment for root uprighting [Figure 2a]. Bend the left plank of wire in anticlockwise direction. In Figure 2b, the wire is bent around beak of

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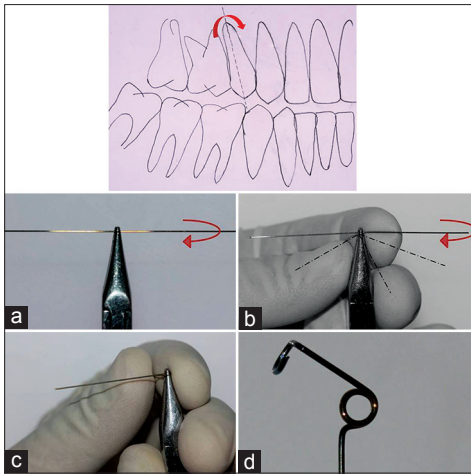


Figure 1: Step by step procedure to fabricate clockwise type uprighting spring. (a) Hold the Australian wire in 139 pliers showing required direction of the bend; (b) Bend the right plank of wire in a clockwise direction, keeping this end under left plank; (c) Make two and half turns and (d) Complete the residual wire bending and final clockwise type uprighting spring

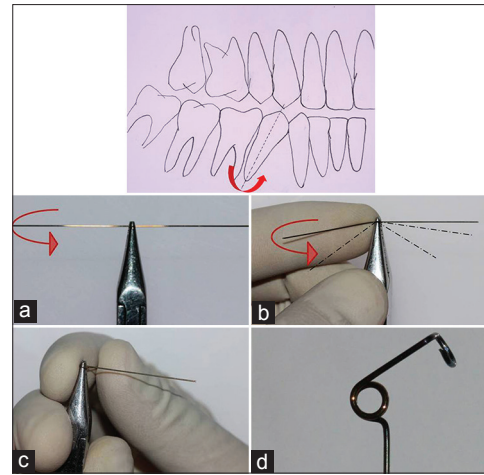


Figure 2: Step by step procedure to fabricate anticlockwise type uprighting spring (a) Hold the Australian wire in 139 pliers showing required direction of the bend; (b) Bend the left plank of wire in anticlockwise direction, keeping this end under right plank, (c) Make two and half turns and (d) Complete the residual wire bending and final anticlockwise type uprighting spring

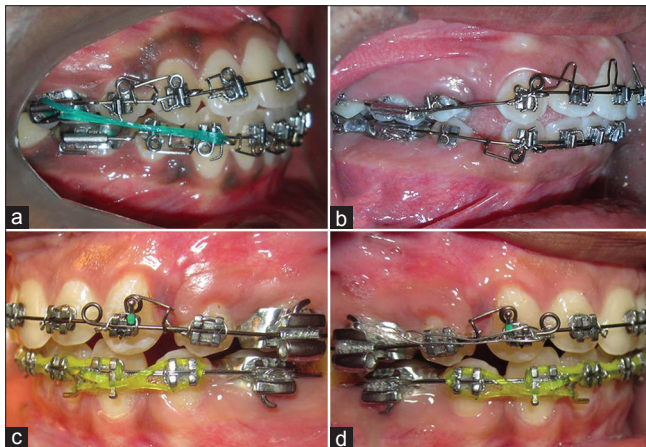


Figure 3: Various uses of Begg's uprighting spring in different clinical situations (a) Stage III of Begg's technique as uprighting of canine and premolars (b) Shows uprighting spring acting as Braking auxiliary to protract lower posterior segment; (c) and (d) Uprighting spring on upper left and right canine respectively with preadjusted edgewise appliance bracket

139 pliers keeping this end under the right plank. Give two and a half turns around the beak [Figure 2c]. Complete the residual wire bending required at activation arm and stem of uprighting spring that is anticlockwise type [Figure 2d].

Alternatively, bending directly from the spool is advisable to prevent wastage. Springs should always be used with rigid base archwires.

DISCUSSION

Contemporary world of orthodontics utilizes different kinds of preadjusted appliances, where all the features to correct 1st, 2nd and 3rd order discrepancies, are incorporated therein.

However, certain clinical situations exist where we need to increase or reinforce the anchorage value at a particular location, to carry out various types of orthodontic tooth movements. Some of these clinical situations are shown in Figure 3, where Begg's uprighting spring has been used as an adjunct to facilitate tooth movements. Barbieri and Barbieri^[3] reported various clinical situations for the use of uprighting spring to reinforce anchorage.

These auxiliaries can also be useful in diverging the roots of canines and or first premolars in presurgical orthodontics for anterior maxillary osteotomy by Wassmund's or Wunderer's technique. Physical factors like gauge and resiliency of the wire, size of the helix, number of the coils, direction of activation^[3] are discussed besides their classical use as mesiodistal uprighting auxiliary.^[1-4] The relationship between diameter of the wire and diameter of the loop referred to as "spring coil index" should be at least six as described by Thurow.^[5,6] This means that loop diameter should be at least 6 times the diameter of the wire (e.g. for wire diameter of 0.012", loop diameter should be 0.072") for its optimal performance. Lesser than this will lead to the creation of internal strain and increases the risk of failure.^[6] So also, while using such kind of auxiliaries, the utmost care must be exercised to prevent or minimize their side effects like labial crown movements, extrusion of anteriors, intrusion of posteriors and buccal crown movements. It is, therefore, absolutely essential that the base archwire be rigid enough, preferably 0.020" premium or 0.018" premium plus, pulse straightened Australian archwires to overcome the side effects.

SUMMARY

A simple and quick method to fabricate uprighting spring has been described here. This can find use to enhance

uprighting (quality and quantity), reinforce anchorage, and presurgical root positioning along with contemporary preadjusted edgewise (or Tip-edge type) appliances. Merely determining the direction (clockwise or anticlockwise) of moments, will help to customize these uprighting springs as per individual needs as shown in Figure 3. Additional advantages are that there is no need for stocking/storing, or any extra investment over the purchase of prefabricated ones.

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How to cite this article: Kumar V, Sundareswaran S. The Begg's uprighting spring - Revisited. *J Orthodont Sci* 2015;4:30-2.

Source of Support: Nil, **Conflict of Interest:** None declared.

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