



Lingual Orthodontics: A Narrative Review

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Abstract

Lingual orthodontics is a specialist area of orthodontics that uses braces that are bonded to the back (lingual) surface of the teeth. It is also referred to as “invisible” or “hidden” braces. In contrast to standard braces, lingual braces are almost undetectable from the exterior, which makes them a popular option for anyone looking to straighten their teeth covertly. Lingual braces function similarly to regular braces in that the teeth are progressively moved into the appropriate positions by light pressure. They are not, however, easily noticeable when you smile or speak because they are positioned on the inside of the teeth. Each patient’s braces are created to order because every tooth’s lingual surface is different. Because of their placement, lingual braces require specialized knowledge to install and adjust, and treatment with them may take a little longer than with regular braces. Although lingual orthodontics provides a discrete alternative for straightening teeth, it might not be appropriate for all individuals. Because of their positioning, lingual braces might make it more difficult for some people to maintain proper oral hygiene and cause discomfort or speech difficulties in others at first. Furthermore, because lingual orthodontic treatment requires specialized materials and knowledge, the cost is frequently higher than that of regular braces.

Keywords: Invisible Braces; Lingual Braces; Orthodontic Treatment; Teeth Alignment

Introduction

Extremely high orthodontic standards have been attained as a result of the creation of several orthodontic techniques and significant advancements in commercial technology. In actuality, there are virtually no restrictions on how successfully any type of malocclusion, skeletal or dental can be resolved [1].

There have been substantial ups and downs with fixed lingual orthodontic equipment since their introduction in

the mid- to late 1970s [2-5]. First launched in the United States in 1979, the first wave of lingual brackets to be mass-manufactured gained popularity [6-8]. At that time, a novel method that would allow teeth to be straightened without the need for conventional labial “outside braces” had just become apparent to the public and media. Many individuals do not seek orthodontic treatment because they believe wearing braces will be embarrassing, despite years of aggressive promotion of somewhat effective alternatives such as ceramic, vinyl, polycarbonate, and cosmetic labial brackets [9].

Advantages [10,11]

- The teeth's facial surfaces are unharmed by adhesive removal, debonding, or bonding.
- There is no negative impact on the gingival tissues of the face.
- Because protruding labial appliances do not deform the contour and drape of the lips, facial contours are genuinely viewed.
- The decreased lingual arch radius on the majority of teeth results in a significant reduction in inters bracket width. The utilization of more robust archwires mitigates this issue.

Drawbacks

- Sensitivity of the tissues and difficulty speaking.
- Impingement of gingiva.
- The challenge of correcting rotation.
- Oral hygiene challenges.
- Technique perceptive.

Development of Lingual Appliances

Adult patients in orthodontic practices are becoming more numerous [12]. Compared to younger age groups, adults have more factors to weigh when deciding whether to pursue orthodontic treatment, including the responsibilities of their jobs and larger social obligations. Lingual orthodontics has emerged as the aesthetically pleasing way to satisfy the needs of a subset of patients who, while accepting all other parts of treatment, are not ready to show off their orthodontic equipment [13,14]. The entire orthodontic device may be positioned on the palatal or lingual surfaces of the teeth for the first time when Miura, et al. [15] introduced an acid etch bonding technique in 1971. The pinnacle of esthetics has been reached with the introduction of lingual appliances to the realm of aesthetic orthodontic appliances [16].

Numerous reports on the ongoing development of the lingual appliance were submitted by the members of the Lingual Task Force and other sources [17]. Due to issues that arose during the early development of the appliance, lingual method has not received as much recognition from orthodontists in many parts of the world [18,19]. Many people believe that the lingual approach is time-consuming for both the orthodontist and the patient, taking, and more effort to use. But new developments in materials and processes due to technology are rekindling interest in lingual protocols [20]. When presented with the option of lingual orthodontics, patients enthusiastically accept it [21]. Before their braces are taken off, they take pleasure in looking confident in their smile [22]. A true cosmetic evaluation can be performed during treatment because the brackets do not affect the

patient's profile or lip position [23].

Selected Cases [24]

Cases Without Extraction

- Good facial pattern, class I with little crowding, deep bite.
- Good facial pattern, deep bite, class I with diastema or space.
- Good facial pattern, moderate class II, deep bite.
- Class II div 2, mandible retruded.
- Deep bite at low angle.

Cases with Extraction

- Class II upper first premolar and lower second premolar are extraction cases.
- First premolar extraction in Class II upper.
- Four premolars extracted together with a little bimaxillary protrusion.
- A deep bite propensity in class III.

Unfavorable Cases

- Cases of open bites
- Reduced bone level due to periodontal involvement
- High angle cases in Class III
- High angle cases in Class II
- Serious disparities in class II
- A brief clinical crown

Bracket System

Different lingual brackets have been created and altered over the last 20 years to improve patient control, mechanical effectiveness, and exact tooth alignment.

Conceal

Instead of opening to the lingual aspect, the arch wire slots open occlusally. Compared to arch wire insertion with linguallly opening slots, this occlusal method facilitates easier arch wire insertion, seating, and removal [25].

Lingual Bracket Fujita

When Fujita's lingual bracket was first released in 1979, it had an opening slot that faced the occlusal. In addition to using ligatures and elastomers to attach the arch wire, a lockpin was placed mesiodistally into a slot in the slot. Even after numerous adjustments were made to the brackets, the occlusal opening remains [26].

STB

Created by doctors Scuzzo and Takemoto and distributed by ORMCO the 1.5mm thick brackets significantly enhance

the patient's comfort throughout orthodontic treatment by causing minimal discomfort when interacting with the appliance and causing no disruption to speech.

Forestadent

For less difficult circumstances, forestadent lingual brackets are provided as 2D brackets, and for more complex cases, as 3D brackets. They are hardly perceptible to the patient and have a very low profile. Utilizing the 2D and 3D lingual-brackets is simple. brackets that self-ligate and provide a vertical slit for quick and simple archwire insertion.

American Orthodontics' Second-Generation Stealth Brackets

The bracket for the American orthodontics simple system: It's an older generation of American orthodontic lingual brackets. Without an auxiliary, this basic bracket has poor rotation control. Additionally, it features a vertical slot where an up-righting spring can be inserted to make up for the insufficient control brought on by an excessively short slot [27].

References

- Vasumrthy S, Saritha T (2009) Lingual Orthodontics. *IJDA* 1(1): 31-37.
- Fujita K (1982) Multilingual bracket and mushroom arch wire technique. A clinical report. *Am J Orthod* 82(2): 120-140.
- Kurz C, Swartz ML, Andreiko C (1982) Lingual orthodontics: a status report. Part 2: Research and development. *J Clin Orthod* 16(11): 735-740.
- Paige SF (1982) A lingual light-wire technique. *J Clin Orthod* 16(8): 534-544.
- Creekmore T (1989) Lingual orthodontics-its renaissance. *Am J Orthod Dentofacial Orthop* 96(2): 120-137.
- Gorman JC (1988) Treatment of adults with lingual orthodontic appliances. *Dent Clin North Am* 32(3): 589-620.
- Fillion D (1998) The resurgence of lingual orthodontics. *Clinical Impressions* 7(1): 2-9.
- Poon KC, Taverne AA (1998) Lingual orthodontics: a review of its history. *Aust Orthod J* 15(2): 101-104.
- Breece GL, Nieberg LG (1986) Motivations for adult orthodontic treatment *J Clin Orthod* 20(3): 166-171.
- Smith JR, Gorman JC, Kurz C, Dunn RM (1986) Keys to success in lingual therapy-part 1. *J Clin Orthod* 20(4): 252-261.
- Gorman JC, Kurz C, Smith JR, Dunn RM (1986) Keys to success in lingual therapy – part 2. *J Clin Orthod* 20(5): 330-340.
- Kurz C, Gorman JC (1983) Lingual Orthodontics: A Status Report. Part 7A. Case Reports - Non extraction, consolidation. *J Clin Orthod* 17(5): 310-321.
- Kurz C, Swartz ML, Andreiko C (1982) Lingual Orthodontics: A status report. Part 2. Research and development. *J Clin Orthod* 16: 735-740.
- Alexander CM, Alexander RG, Gorman JC, Hilgers JJ, Kurz C, et al. (1982) Lingual orthodontics: A status report. Part 1. *J Clin Orthod* 16: 255-262.
- Alexander CM, Alexander RG, Gorman JC, Hilgers JJ, Kurz C, et al. (1983) Lingual orthodontics: A status report. Part 5. Lingual mechanotherapy. *J Clin Orthod* 17(2): 99-115.
- Gorman JC, Hilgers JJ, Smith JR (1983) Lingual Orthodontics: A status report. Part 4. Diagnosis and treatment planning. *J Clin Orthod* 17(1): 26-35.
- Scholz RP, Swartz ML (1982) Lingual Orthodontics: A Status Report. Part 3 Indirect Bonding - Laboratory and Clinical Procedures. *J Clin Orthod* 16(12): 812-820.
- Smith JR (1983) Lingual Orthodontics: A Status Report. Part 7B. Case Reports - Extraction Treatment. *J Clin Orthod* 20: 252-261.
- Paige SF (1982) A lingual light - wire technique. *J Clin Orthod* 16(8): 534 - 544.
- Kelly VM (1982) Interviews on lingual orthodontics. *J Clin Orthod* 16: 461-473.
- Artun JA (1987) A post treatment evaluation of multi bonded lingual appliances in orthodontics. *Eur J Orthod* 9(3): 204-210.
- Creekmore T (1989) Lingual orthodontics: Its renaissance. *Am J Orthod Dentofac Orthop* 96(2): 120-137.
- Smith JR, Gorman JC, Kurz C, Dunn RM (1986) Keys to Success in Lingual Therapy. Part 2. *J Clin Orthod* 20(5): 330-340.
- Echarri P (2006) Lingual orthodontics: patient selection and diagnostic considerations. *Semin orthod* 12(3): 160-