

LINGUAL ORTHODONTICS – AN OVERVIEW

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Abstract

Man has been striving for generations to improve his outlook, his appearance- what he calls the aesthetic value. The face [in general] and the teeth have also come to play a part in his presentation to the outside world. To enhance this desire, attention has been given to correct malformations of teeth. In earlier times this was done by crude methods. And then evolved the concept of “braces”; fixed on the labial surfaces. Orthodontists have given a new dimension to their arena of operations, shifting from the labial to the lingual so as to give rise to the concept of “invisible braces” or Lingual Orthodontics

Key words

Invisible Braces, Bracket Design, TARG

LINGUAL ORTHODONTICS – AN OVERVIEW

Man has been striving over generations to improve his outlook, his appearance – what he calls the esthetic value. The face [in general] and teeth have also come to play a part in his presentation to the world. To enhance this desire, attention has been given to correct the malformations of teeth. Earlier it was done by crude methods. But with advancements in science, newer methods and materials have evolved. Orthodontists are also striving towards this goal and have produced the best of results by giving a new dimension to their arena of operations, changing from the labial to the lingual so as to give rise to a new concept “the Invisible Braces” concept or “Lingual Orthodontics”. The value of invisible braces is not in the hardware, but perhaps best expressed in the word “invisible”.

PATIENT SELECTION

Lingual therapy is demanding on both the patient and the dentist. So the patient must be made aware that it will require greater effort and chair time. The most important factors in selecting patients for lingual treatment seem to be their personalities and reasons for seeking treatment. The patient should be informed of the rationale and the effects of lingual appliance, speech, soreness, bite opening] and told that their attitude should be one of understanding and a desire to do whatever is necessary to accomplish the optimum results.

BRACKET DESIGN

To compensate for the tooth form and shape seen on the lingual, some considerations in bracket design need to be followed:

1 Since inter bracket distance is reduced on the

lingual, the bracket must be designed to be as narrow as possible.

2 Because of decreased bracket width, mesio-distal root control becomes difficult which can be taken care of using vertical slots for auxiliaries.

3) Since the lingual contours of teeth vary a lot, the amount of torque supplied by the bracket will be very sensitive to its occluso-gingival placement. This can be solved by indirect bonding procedures with Pre-angulated pre-torqued brackets.

4) Consideration should be given to the ease of insertion, ligation and removal of the arch wires.

Eventually the method selected for the determination of lingual bracket torques and thickness was to relate the lingual determinants to labial tooth anatomy. Tracings of the labial and lingual profiles were made and a line was drawn through the LA point (now FA point), representing the plane to the arch wire, to define labial torque. Lingual equivalent torque values were then calculated studied statistically and reduced to set of average lingual torque values. Similar studies were conducted to define lingual pad profile and contours, lingual molar bracket torques, rotations, base curvatures and in-out relationships.

BRACKET PLACEMENT

The many variations in tooth size, lingual contour, cingulum and marginal ridge anatomy, inconsistencies in tooth form, shape and inclination of the lingual surface make the use of predetermined bracket placement of no much utility. Smith et al suggested the use of indirect bonding by TARG (torque and angulation reference guide). The TARG instrumentation is designed to transfer bracket prescriptions from the more reliable labial surfaces of each tooth to the lingual at a given bracket height.

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This allows to set customized torque and angulation for each tooth.

ARCH WIRES

There is a dramatic difference in the arch form with lingual treatment. Fujita described the "Mushroom Arch" as necessary in lingual treatment because of the difference in facial – lingual thickness of anterior and posterior teeth; also there is a large constriction in arch width as one proceeds distally from the lingual surface of canine to the bicuspid. Since the brackets are designed to minimize bracket profiles, it is necessary to place compensating 1st order bends interproximally at cuspid-bicuspid and bicuspid-molar regions.

BONDING

For bonding of lingual brackets, the preferred mode of placement is indirect because:-

1. The variation in lingual tooth morphology creates the need for custom measurement for selection of appropriate bracket base thickness and torque.
2. The clinician's lack of familiarity with lingual tooth morphology makes it difficult to visualize angulations and bracket heights.
3. It is difficult to obtain a direct line of sight for bonding.
4. Increased accuracy in bracket placement is required because compensating lingual arch wire bends are more difficult and time consuming to form.

A modified dental surveyor and TARG (torque and angulation reference guide) are used to align the lingual surfaces relative to the labial crown inclinations. Once the bracket slot height and angulation are marked, indirect bonding of the brackets on the lingual is done.

TREATMENT SEQUENCE

Four phases are normally seen:

1. Leveling, aligning, rotational control and bite opening.
2. Torque control.
3. Consolidation and retraction.
4. Detailing and finishing.

CONCLUSION

Many patients would like to have the benefits offered by high quality orthodontic treatment but do not want to have braces that are visible to their friends and colleagues, a situation considered to be a social stigma by some. Lingual orthodontics is a way out for such patients. The lingual appliance is no panacea, but if patients are carefully selected, lingual braces can be a valuable addition to the orthodontist's armamentarium.

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