

## Lingual orthodontics

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### Abstract

Aesthetics corrections of teeth and jaws are undertaken in dentistry by Orthodontics and dentofacial orthopaedics. Any mal occlusion can be corrected by using braces fixed on to the teeth, on its labial side (front side). This branch of orthodontic has been in increasing demand among adults which necessitated innovative unique approaches. Adults' primary concern appears to be aesthetic. There are various types of braces available to serve this purpose. Though there are ceramic brackets, plastic or composite brackets, lingual orthodontic system is the improved aesthetic alternative.

**Keywords:** Lingual orthodontics, invisible orthodontics.

### Introduction

The inside (tongue or palate) surface of the tooth is termed "Lingual". Braces that are attached to the inside surface, unlike traditional distracting typical braces fixed to the outside of the teeth, makes them practically invisible and provides cosmetic orthodontic treatment.

*Fig.1. Correction of malocclusion by mechanical appliance placed in the lingual aspect*



### Lingual system

Correction of malocclusion by mechanical appliance placed in the lingual aspect (Fig.1.)

**Advantages of lingual system** (Giuseppe scuzzo & Kyoto Takemoto, 2003)

- Aesthetics is the main advantage as the braces are not visible outside.
- Labial surface of the teeth is not damaged by procedures done during the orthodontic treatment procedures including etching, bonding or deboning.
- Facial gingival tissues are not adversely affected.
- Position of the teeth can be more precisely monitored as brackets are only lingually placed.
- Since contour & the drape of the lips are not distorted by the protruding labial

- Appliances facial contours can be monitored.

### Disadvantages

- Tongue Irritation
- Speech difficulty
- Sensitivity to Laboratory techniques
- Extended Chair Time
- Higher cost compared to regular labial brackets.

**Indications** (Smith *et al.*, 1986; Gorman *et al.*, 1986; Pablo Echarri, 2006)

#### Non extraction cases

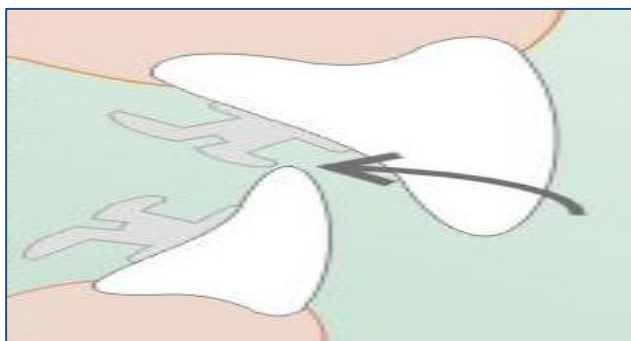
- Deep bite cases
- Class I with mild crowding
- Class I with generalised spacing
- Arch expansion
- Diastema closure
- Class II with retruded mandible

#### Extraction cases

- Class I bidental protrusion - all first bicuspid extraction, where in anchorage is not critical
- Class II only upper bicuspid extraction

With some difficulty surgical cases and class III cases can be treated with lingual orthodontics.

Fig. 2. First lingual appliance



### Contra indications

- Acute Temporo mandibular joint dysfunction
- Mutilated posterior occlusions
- High angle / dolichofacial patterns
- Extensive anterior prosthesis
- Short clinical crowns
- Critical anchorage cases

- Poor oral hygiene or unresolved periodontal involvement
- Unadaptable or demanding personality types.

### History

Dr. Craven Kurz developed first true lingual appliance in early 1970. High bond failure due to shear force was the main disadvantage of lingual appliances developed by various people (1970-1976) (Creekmore, 1989; Ryoong Ki Hong & Hee Wook Sohn, 1999) (Fig.2.)

The turning point in the development of the appliance was the addition of an anterior inclined plane as an integral part of the maxillary anterior brackets. This inclined plane converted the shearing forces produced by the mandibular incisors to compressive forces applied in an intrusive and labial direction. (Fig.3.)

Fig .3. Inclined plane in upper bracket



The uses of inclined plane are it is used as a functional appliance facilitates the unlocking of a retruded mandible, expanding the arch, in extrusion of posterior segments, intrusion of lower incisors in deep bite cases and easier translation of teeth around the arch, when the midline due to contact with the flat metal plate is off centered on the incisor brackets.

**Generations of lingual brackets** (Aldo Macchi *et al.*, 2002; Navarro *et al.*, 2006)

- GENERATION I - 1976 - 1979
- GENERATION II - 1980
- GENERATION III - 1981
- GENERATION IV - 1982-84
- GENERATION V - 1985-86
- GENERATION VI - 1987-90
- GENERATION VII - 1990 - till date

**Incognito system** (Thomas Stamm *et al.*, 2005; Laura Buso- Fost & Didier Fillion, 2006)

Incognito lingual braces are specially designed lingual system. The brace is manufactured by CAD/CAM technology and the brackets are made of hypoallergenic gold alloy where it is custom made for each patient. It causes no damage to the surface of the teeth and has little effect on speech. Brackets and wires are manufactured suitable for each corrected tooth of patient. (Fig.4.)

Fig .4. Incognito system



## Conclusion

Lingual orthodontics can be a valuable gift to encourage patients for aesthetic reasons hesitant to wear the ceramic or clear plastic braces. But only a privileged few can undergo this treatment due to cost factor.

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