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Treatment Of Class I Malocclusion Patients With Lingual Brackets Using Simplified Method: An Alternative To Patients With Esthetic Concerns In Both Non-Extraction And Extraction Treatment- A Case Series

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ABSTRACT:
Esthetics continues to be a primary concern for patients seeking orthodontic treatment. There are a continuously increasing numbers of adult patients seeking orthodontic therapy, but these patients often refuse the traditional labial orthodontic treatment because of social or personal or professional reasons .As adults increasingly seek orthodontic treatment, a growth has been witnessed in the demand for aesthetic orthodontics, the ultimate of which are appliances bonded to the lingual surfaces of the teeth. Lingual appliance costs, treatment times, and results were comparable to those of labial appliance treatment. Given these advantages for patients, the perfection of lingual treatment seems worthwhile despite of being technique sensitive. This paper discusses two cases with class I molar malocclusion treated with lingual fixed machanotherapy. First case discussed was treated with non extraction method and the second in extraction method.

KEYWORDS: *Lingual orthodontics,class I malocclusion,upper incisor torque*

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I. Introduction:

Over the past two decades, the demographics of patients receiving orthodontic treatment has changed from predominantly children to a marked increase in the number of adults. In part, the advent of aesthetic appliances has influenced this increase in the acceptability of orthodontic care for adults[1].Many adults who require orthodontic treatment refuse it due to conventional appliance appearance problems[5,6] .This high esthetic demand of patients[7] led to the promotion of various esthetic appliances such as esthetic brackets, clear aligners, and lingual orthodontics[8].Currently, the ultimate aesthetic appliance that provides full three-dimensional control of tooth movement is the lingual appliance[2]. Lingual appliance system is more difficult because of unpredictable lingual surface anatomy, no direct access to lingual surface, and different point of application of force. Key factor for successful orthodontic treatment is precise bracket positioning. Therefore, several indirect bonding procedures have been developed for lingual technique[10].

For the patient, lingual appliances have several clear-cut advantages over labial appliances: (1) facial surfaces of the teeth are not damaged from bonding, debonding , adhesive removal, or decalcification from plaque retained around labial appliances, (2) facial gingival tissues are not adversely affected, (3) the position of the teeth can be more precisely seen when their surfaces are not obstructed by brackets and arch wires, (4) facial contours are truly visualized since the contour and drape of the lips are not distorted by protruding labial appliances, and (5) most adult and many young patients would prefer "invisible" lingual appliances if costs, treatment times, and results were comparable to those of labial appliance treatment. Given these advantages for patients, the perfection of lingual treatment seems worthwhile[4].

Present article discusses 2 cases of Class I malocclusion treated by Lingual mechanotherapy . First case with generalized spacing was treated in non-extraction method and the second case with crowding was treated with extraction method in the Department Of Orthodontics and Dentofacial orthopedics , Dr. R Ahmed Dental College and Hospital ,Kolkata.

II. Case Reports:

CASE-1

A 23 years female patient reported to the department of orthodontics and dentofacial orthopedics with a complaint of gap between her teeth for which she was not confident about her smiling. On extraoral examination patient had a convex profile and had a well-balanced, symmetric face with competent lips. Intraoral examination showed bilateral angle class I molar relation with generalized anterior spacing in both maxillary and mandibular arch.There was proclination in maxillary and mandibular anteriors with normal overjet. Cephalometric analysis showed that the patient had class I skeletal relation with hypodivergent growth pattern. Pre treatment photographs are illustrated below(fig-1, fig-2).

Patient was planned to be treated with fixed orthodontic treatment mechanotherapy . As the patient was an adult and had a day job and more esthetically conscious, during the final treatment planning discussion session she choose lingual braces for her orthodontic correction of malocclusion.

FIG 1: PRE TREATMENT EXTRAORAL PHOTOGRAPHS

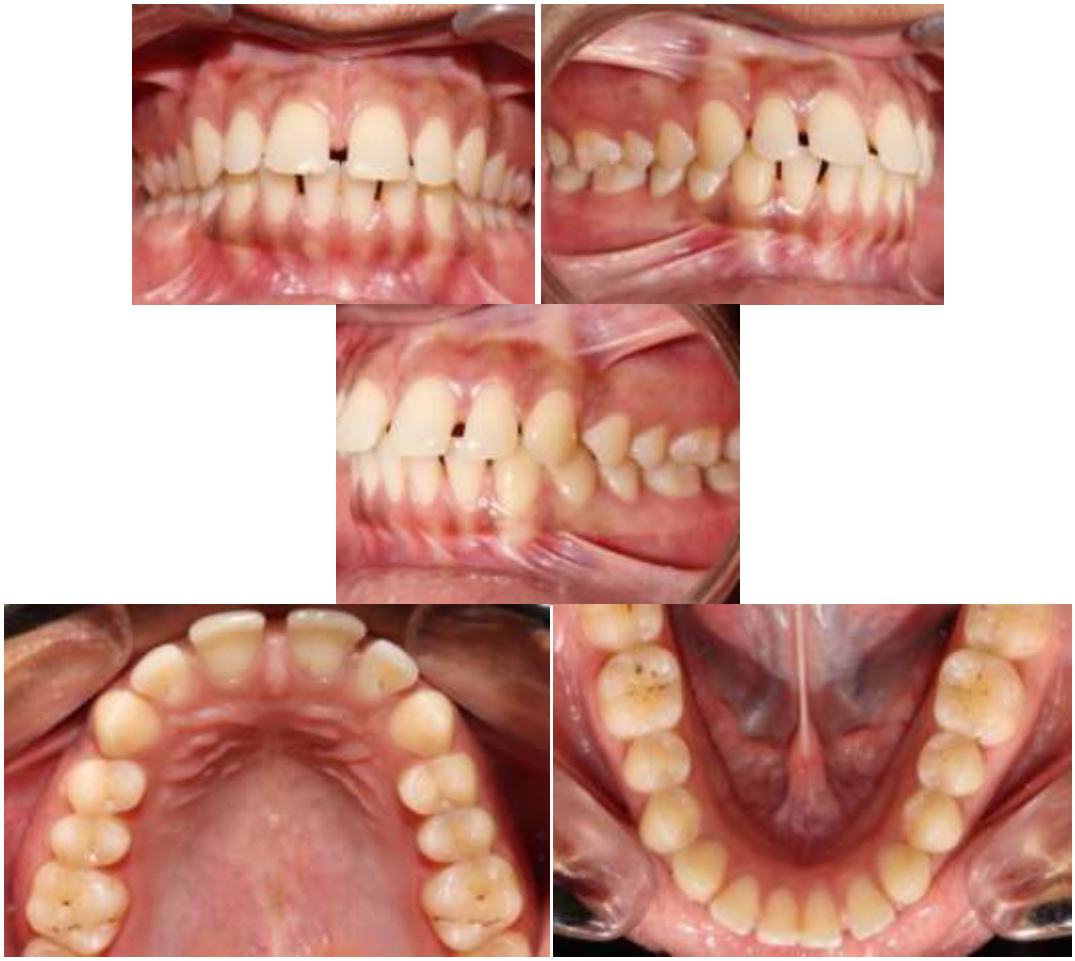

FIG 2: PRE TREATMENT INTRAORAL PHOTOGRAPHS

Treatment progress:

Indirect bonding of the lingual brackets were done by simplified method. Treatment started with alignment and leveling with 0.012" ,followed by 0.014" and 0.016" mushroom shaped arch wires using superelastic Ni-Ti. The alignment was continued with 16X22 TMA wire. Then 16X22 SS wire was given followed by space closure using elastic chain. The treatment was finished within 18 months. Patient was satisfied with the treatment. Fixed retention was placed after treatment completion.post treatment photographs of this patient are illustrated below (fig-3 and fig -4).

FIG 3: POST TREATMENT EXTRAORAL PHOTOGRAPHS

FIG 4: POST TREATMENT INTRAORAL PHOTOGRAPHS

CASE- 2:

A 16 years old female patient reported in the OPD with complaint of irregularly arranged lower teeth and forwardly placed upper teeth.

On examination she had bilateral class 1 molar realation with proclined upper teeth , crowing in lower anterior arch with an increased overjet of 10 mm.

She was planned to be treated with extraction of all first premolars followed by fixed mechano therapy. She opted for lingual braces as she was conscious about her smile. The pre treatment photographs and radiographs are illustrated below(fig -5, fig -6, and fig-7)

FIG 5: PRETREATMENT EXTRAORAL PHOTOGRAPHS

FIG 6: PRETREATMENT INTRAORAL PHOTOGRAPHS

FIG 7: PRETREATMENT RADIOGRAPHS

Treatment progress:

Extractions of all four first premolars were done. In Maxillary arch indirect bonding of the lingual braces were done using simplified technique. Initial leveling and alignment was done using 0.012", 0.014", 0.016" superelastic Ni-Ti , mushroom shaped arch wires. 16X22" TMA wire was used for alignment. In mandibular arch first the canines were retracted using light elastic traction force from buccal button bonded to the 33 and 43 to the molar bands placed on 37 and 47 respectively. After canine retraction lingual brackets in lower arch were bonded using simplified method. Lower arch was decrowded and aligned with 0.012'', 0.014'', 0.016'' superelastic Ni-Ti, mushroom shaped arch wires followed by 16X22'' TMA wire. Finally 16X22" SS wire was placed in both the arches and light elastic chain traction was applied from buccal button bonded to the 13,23,33,43 to the molar bands placed on 17,27,37,47 respectively. Intraoral mid treatment photographs with elastic traction placement are illustrated below(fig-8)

FIG 8: INTRAORAL MIDTREATMENT PHOTOGRAPHS

Treatment result showed significant improvement of patient's profile, occlusion and facial balance. Post treatment orthopantomogram showed achievement of root parellalism. Class I molar relation with proper overjet and overbite was achieved. The teeth were then retained with fixed retainer. The whole treatment took 24 months to complete. The patient was very pleased with the treatment.The post treatment photographs (fig-9, fig- 10), radiographs (fig-11), cephalometric superimposition(fig-12) are illustrated below. Pretreatment and Post treatment cephalometric comparison are mentioned below(table 1)

FIG 9: POST TREATMENT EXTRAORAL PHOTOGRAPH

FIG 10: POST TREATMENT INTRAORAL PHOTOGRAPHS

FIG 11: POST TREATMENT RADIOGRAPHS

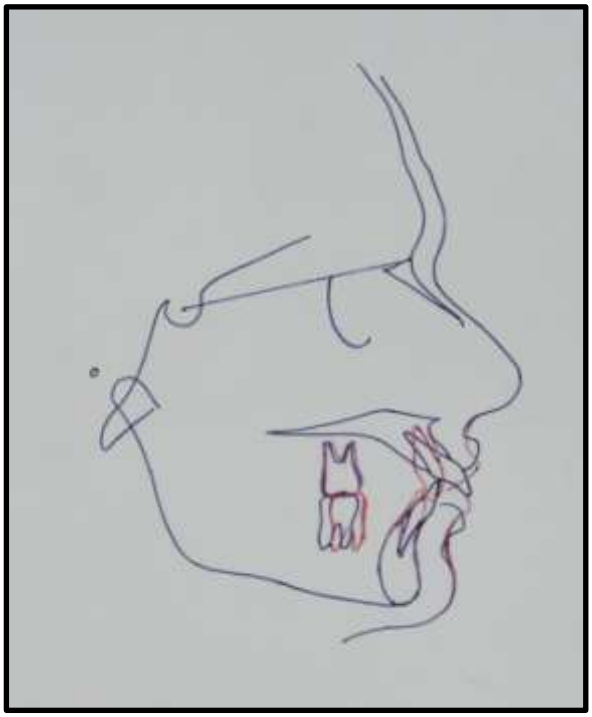

FIG 12: CEPHALOMETRIC SUPERIMPOSITIONTREATMENT COMPARISON

TABLE 1: PRETREATMENT AND POST CEPHALOMETRIC VALUE

Parameters	Pre	Post
SNA	83^0	82^0
SNB	79^0	80^0
IMPA	112^0	94^0
NA to upper incisor (linear/angular)	$9mm/44^0$	$0mm/21^0$
NB to lower incisor (linear/angular)	$5mm/31^0$	$3mm/18^0$
Interincisal angle	116^0	138^0
E LINE(U/L)	6mm/4mm	3mm/2mm

III. Discussion:

Lingual orthodontics can be an appropriate alternative for patients who are esthetically concerned. Lingual orthodontics method is most esthetically sound option ,which require good precision . Lingual appliance system is more difficult because of unpredictable lingual surface anatomy, no direct access to lingual surface, and different point of application of force. Key factor for successful orthodontic treatment is precise bracket positioning[10]. In the cases of extraction, Liang et al. [11] emphasized the need to increase lingual root torque, vertical intrusive force, and decrease horizontal retraction force. In present case of class I malocclusion with closed bite on class I skeletal base, bite opening is extremely difficult task with conventional labial mechanotherapy. Lingual orthodontics has added advantages in bite opening because of inbuilt feature of bite plane on maxillary anterior brackets Inspite of the lingual technique having a great disadvantage of loosing torque in extraction line of treatment [3] it has the distinguished advantage of not flaring the incisors labially in non extraction treatment. Control must be given to the incisor torque during retraction in extraction cases.

IV. Conclusion:

The lingual bracket system is the ultimate in aesthetic appliances because not only are lingual appliances discreet, but the labial surfaces of the teeth are not damaged from bonding, debonding, adhesive removal or decalcifications. Lingual appliances, despite a turbulent beginning, have come of age. Driven by market demand and the patient's desire for the ultimate in aesthetics, clinicians are treating increasing numbers of patients with lingual appliances. Advances in technology related to bracket design and laboratory procedures have overcome many of the earlier problems, however, tongue discomfort, speech problems and masticatory difficulty remain, often in the early stages of treatment. In the hands of an experienced lingual clinician, there is no difference in quality of the treatment outcome or the treatment time when using a lingual appliance system compared to a traditional buccal fixed appliance therapy. Our patients deserve to have treatment options that not only deliver an excellent treatment outcome but also allow them to experience excellent esthetic treatment[12].

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