



Lateral Incisor: Overtaking Others from behind

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Authors' contributions

This work was carried out in collaboration between both authors. Author PS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author JS managed the analyses of the study, managed the literature searches and wrote the final draft of the manuscript. Both authors read and approved the final manuscript.

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Case Report

ABSTRACT

In order to preserve the integrity of the dental arch, repositioning of the displaced lateral incisors to their normal position next to the central incisors should be considered. The conventional method for aligning ectopic lateral incisor is to tie the ectopic teeth with the help of a ligature wire to the initial aligning round-NiTi wire, which is the base wire or by engaging open coil spring. This would take more time to align the ectopic tooth. Hence we are presenting here 3 cases (Figs. 1-3) of lingually placed lateral incisor & will evaluate the best technique to align them properly.

Keywords: Lateral incisor; MBT; Beggs; Tip edge.

1. INTRODUCTION

Cross bite is a type of malocclusion that is frequently encountered in the practice of orthodontics. We can identify this malocclusion when the lower teeth are in buccal or labial

position in regard to upper teeth, in a unilateral, bilateral, anterior and/or posterior manner. These malocclusions can have a skeletal or dental component or mix of both, they are relatively easy to treat if they are intercepted at an early age.

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Lingually positioned teeth are one of the most common orthodontic problems in growing patients. It generally occurs in the primary and mixed dentition as a result of disharmony in skeletal, functional, and dental components of the child. This is characterized by one or more anteroposterior teeth that occlude behind the lingual aspect of the anterior inferior. The mandibular permanent lateral incisor has been found to be the most frequently ectopically erupted tooth [1,2]. The condition may occur both unilaterally and bilaterally, but a greater incidence of the former has been reported [3,4]. The right side appeared to be involved more often than the left side [5-9].

In order to preserve the integrity of the dental arch, repositioning of the displaced lateral incisors to their normal position next to the central incisors should be considered. The conventional method for aligning ectopic lateral incisor is to tie the ectopic teeth with the help of a ligature wire to the initial aligning round-NiTi wire, which is the base wire or by engaging open coil spring. This would take more time to align the ectopic tooth. Hence we are presenting here 3 cases (Figs. 1-3) of lingually placed lateral incisor & will evaluate the best technique to align them properly.

2. TECHNIQUE AND DISCUSSION

Written consent was obtained from the patient & his parent before starting any kind of orthodontic intervention. The placement of a brace on lingual aspect of tooth is a very simple way to take a tooth that is in a cross bite to its correct position in dental arch. In this context we wrapped the ectopic lateral incisor with the wire which passes along the lingual surface of tooth and then back to labial surface. The idea of this technique was discussed with the local dental association's ethical committee & approval taken from the same before starting the procedure. To achieve a better control, a Begg bracket was bonded on the lingual side. The physical property of wire is used

for alignment, i.e thermal NiTi wire which is 6 times the flexibility to that of normal stainless steel wire. These wires are very versatile, because they offer extreme elasticity and can be used for long periods of time without the need of being replaced.

The advantage of this method are (I) Distalization of the adjacent central incisor and canine to create space for lateral incisor, (II) Controlled movement of the ectopic lateral incisor and (III) Alignment of lateral incisor to the mandibular arch.

In the lingually positioned incisors it is difficult to achieve stable root correction. There is a risk of moving the crown labially, while leaving the root palatally placed. In such situation, there will be need for additional wire bending and treatment time will be extended. Hence here 3 different cases are evaluated with ectopically erupted mandibular lateral incisor in the fourth quadrant as shown in Figs. 1, 2, and 3.

Traditionally there are many ways to manage these cases and they involve procedures using

1. Begg's technique,
2. Tip edge technique,
3. Straight wire technique.

2.1 With Begg's Technique, Disadvantages are

- Conventional technique
- Need for precise wire bending
- Loss of torque and difficulty to control anchorage
- Time and cost factor
- Patient compliance
- Cannot be used in severe cases
- We need to align by giving NiTi as a piggyback along with the main arch wire & use Mollenhaurer's specks for correction crown inclination.



Fig. 1a. lingually placed 42 (mild)



Fig. 2a. lingually placed 42 (moderate)



Fig. 3a. lingually placed 42 (severe)



Fig. 1b. OPG of Mildly imbricated 42



Fig. 2b. OPG of Moderately imbricated 42

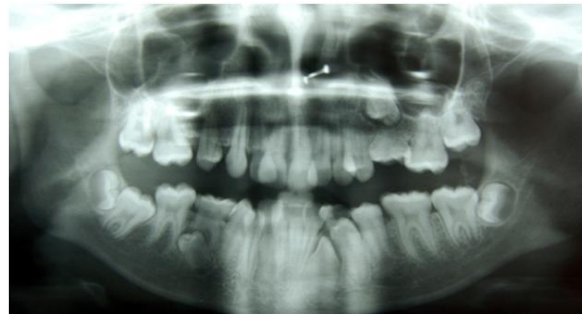


Fig. 3b. OPG of severely imbricated 42

2.2 With Tip Edge Technique, Disadvantage are

- ✓ Precise wire bending is needed
- ✓ Complicated technique of alignment
- ✓ Loss of torque and difficulty in anchorage control
- ✓ Time factor (Wastage of time) & Cost factor
- ✓ Patient compliance
- ✓ Cannot be used in severe cases

2.3 Using Straight Wire Technique

During alignment stage, it's necessary to create enough space for lingually placed tooth.

This is achieved using: Open coil spring (Fig. 4) or Tying lace backs (Fig. 5) or Using power chains to move the adjacent teeth. And, the bracket of adjacent teeth are tied with ligatures, to prevent rotations.

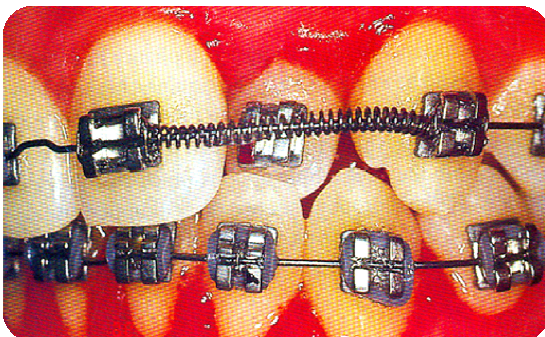


Fig. 4. Open coil spring



Fig. 5. Tying lace backs

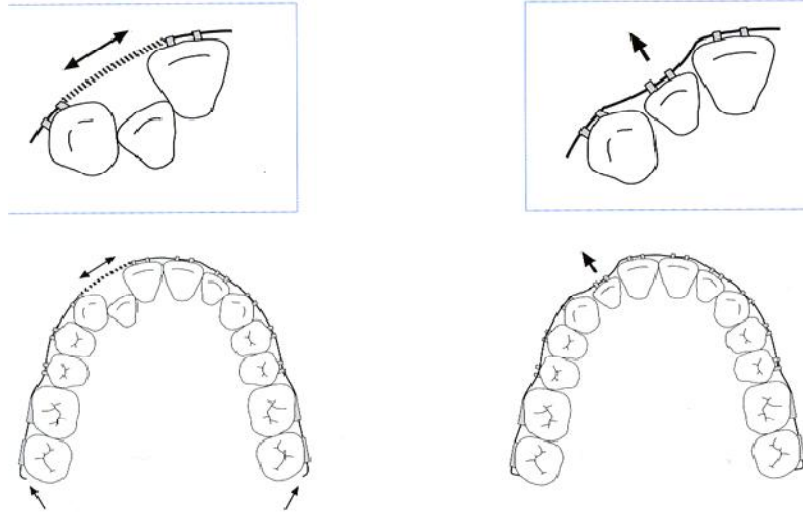


Fig. 6. Mechanism of action of open coil spring & NiTi wire

2.4 MBT- Systemized Orthodontic Treatment Mechanics

2.4.1 Disadvantage are

- ✓ Time factor
- ✓ Cost factor (use of OPEN COIL spring and NiTi wire) (Fig. 6)
- ✓ Additional wire bending is required in severe cases
- ✓ Difficulty in torque control
- ✓ Complicated technique of alignment
- ✓ Patient compliance

Hence Aligning lingually erupted lateral is a challenge in day to day clinical practice for an orthodontist, and with our technique creating space becomes faster and easier and aligning can be done with same arch wire. Hence, we are saving time and money.

3. RECOMMENDATIONS

1. We recommend using of this technique in cases where lingually positioned teeth need labial torque and the adjacent teeth are proclined.
2. This technique can be used in Class II division 2 cases where the anteriors are proclined and lateral incisors are palatally placed. In this context we have instead, wrapped the ectopic lateral incisor with the wire which passes along the lingual surface of tooth and then back to labial surface. To achieve a better control, a Begg bracket was bonded on the lingual side as shown in Fig. 8. The initial wire used to align was 0.014 round copper NiTi.

(Note: The palatally displaced or lingually displaced incisor is bracketed with the normal bracket, but it is rotated 180°, which changes torque from + to -. This assists in labial root torque at rectangular wire stage).

3. We recommend the use of edge wise bracket on the lingual aspect instead of Begg's bracket.

Note: Begg's bracket was used in our cases and tied using ligature wire for better control

4. This technique is recommended in patients with good oral hygiene
5. Strict appointment control is imperative to avoid uncontrolled movements
6. Once the tooth is uncrossed and the braces has been repositioned, we must control the root torque of the tooth to provide more stability to the treatment and to avoid rebound / relapse.
7. Circumferential Supracrestal Fibrotomy (CSF) / Pericision is recommended in teeth that are very misplaced, because there is high tendency of these teeth to return to their original position due to the memory of the periodontal fibers
8. Ferulize with ligature the adjacent teeth to the crossed tooth. This will increase dental anchorage and minimize any undesired movements
9. Place ice on the surface of the wire to make it more flexible and malleable, so the placement of wire will be easier.

10. The use of round NiTi thermal wire is recommended

The advantage of this method are

- It's an easy technique
 - It requires a strict appointment control, because these wires are activated by body heat, so they are always active and can produce undesired tooth movement
 - We do not require patient compliance
 - We do not need anything special because the materials employed are common use in our practice
- Distalization of the adjacent central incisor and canine to create space for lateral incisor
 - Controlled movement of the ectopic lateral incisor
 - Once the tooth has been uncrossed, just engage the main arch wire on to the buccal bracket
 - Depending upon the degree of cross bite that the tooth presents, the correction can take about a month
 - Alignment of lateral incisor to the mandibular arch. Leveling and alignment of mandibular arch by this method is shown in Figs. 7-9.



Fig. 7(a). Initial Bonding of mildy imbricated 42



Fig. 7(b). Alignment of mildy imbricated 42



Fig. 7(c). Post alignment OPG of mildy imbricated 42

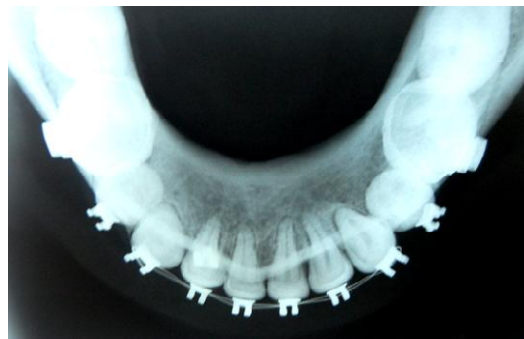


Fig. 7(d). Post alignment Occlusal radiograph of mildy imbricated 42



Fig. 8(a). Initial Bonding of moderately imbricated 42



Fig. 8(b). Alignment of moderately imbricated 42



Fig. 8(c). Post alignment OPG of moderately imbricated 42



Fig. 8(d). Post alignment Occlusal radiograph of moderately imbricated 42



Fig. 9(a). Initial Bonding of severely imbricated 42



Fig. 9(b). Alignment of severely imbricated 42



Fig. 9(c). Post alignment OPG of severely imbricated 42



Fig. 9(d) Post alignment Occlusal radiograph of severely imbricated 42

4. DISADVANTAGES

1. Occasionally wire can be cumbersome
2. Because it is a violent movement, it can provoke tooth pain and gingival inflammation
3. No control on root torque.

5. CONCLUSION

After evaluating the pros & cons of all the techniques (Begg's technique, Tip edge

technique, Straight wire technique & MBT-Systemized orthodontic treatment mechanics) the authors have clearly demonstrated with help of the above 3 cases that above modifications can be routinely used in day to day practice for better & shorter treatment results.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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