

ORIGINAL ARTICLE

Assessment of effect of Bony Changes following molar mesialization- An Original Research

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ABSTRACT:)

Background: The speed and extent of alveolar ridge resorption depend on the time elapsed since tooth extraction as well as individual features. The present study was conducted to assess bony changes following molar mesialization. **Materials & Methods:** The present study was conducted on 72 patients age ranged 16-26 years of both genders. In all subjects upper and lower teeth were aligned until completion using a 0.018 × 0.025-inch stainless steel archwire. Corticotomy process was performed by the same maxillofacial surgeon at 2 weeks before the second molar was moved. Bone changes were assessed before corticotomy and 6 months after procedure. **Results:** Out of 72 patients, males were 40 and females were 32. The marginal bone level on buccal side before procedure was 4 mm which decreased to 3.8 mm after treatment. On lingual side, it was 2.2 mm and 2.6 mm before and after procedure. Bone height showed significant increase from 2.1 mm to 2.7 mm (P < 0.05). **Conclusion:** Author found increase in lingual marginal bone and height of bone after performing procedure.

Key words: Marginal bone, Mesialization, Malocclusion.

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INTRODUCTION

It has been established that after tooth extraction, there are reductions in the buccolingual and occlusogingival dimensions. The speed and extent of alveolar ridge resorption depend on the time elapsed since tooth extraction as well as individual features.¹ The rate of mandibular alveolar resorption is 3–4 times greater than that of maxillary alveolar resorption because it is a smaller denture-bearing area with a greater load per square millimeter. When the buccolingual thickness of the alveolar bone is decreased, mesial movement of the mandibular second molar to close the space left by the mandibular first molar extraction can result in multiple risk factors, as the mandibular second molar root may not make contact with the cortical plate.²

These risks include dehiscence, fenestration, alveolar bone support loss, anchorage loss, devitalization, root resorption, and lack of new bone formation. Moreover, treatment time is prolonged, as the rate of cortical bone remodeling is only approximately 0.5 mm/months. In general, orthodontists prefer to open the atrophic extraction space by manipulating the molar to an upright position and

stabilizing it with a prosthesis. However, orthodontic space closure is the most cost-effective option, particularly for adolescents and young adults who will experience at least five decades of longevity.³ The present study was conducted to assess bony changes following molar mesialization.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics. It comprised of 72 patients age ranged 16-26 years of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

In all subjects upper and lower teeth were aligned until completion using a 0.018 × 0.025-inch stainless steel arch wire. Corticotomy process was performed by the same maxillofacial surgeon at 2 weeks before the second molar was moved. Decorticated bone on edentulous area was covered by bone graft material. Bone changes were assessed before corticotomy and 6 months after procedure. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

| | Total- 72 | |
|--------|-----------|---------|
| Gender | Males | Females |
| Number | 40 | 32 |

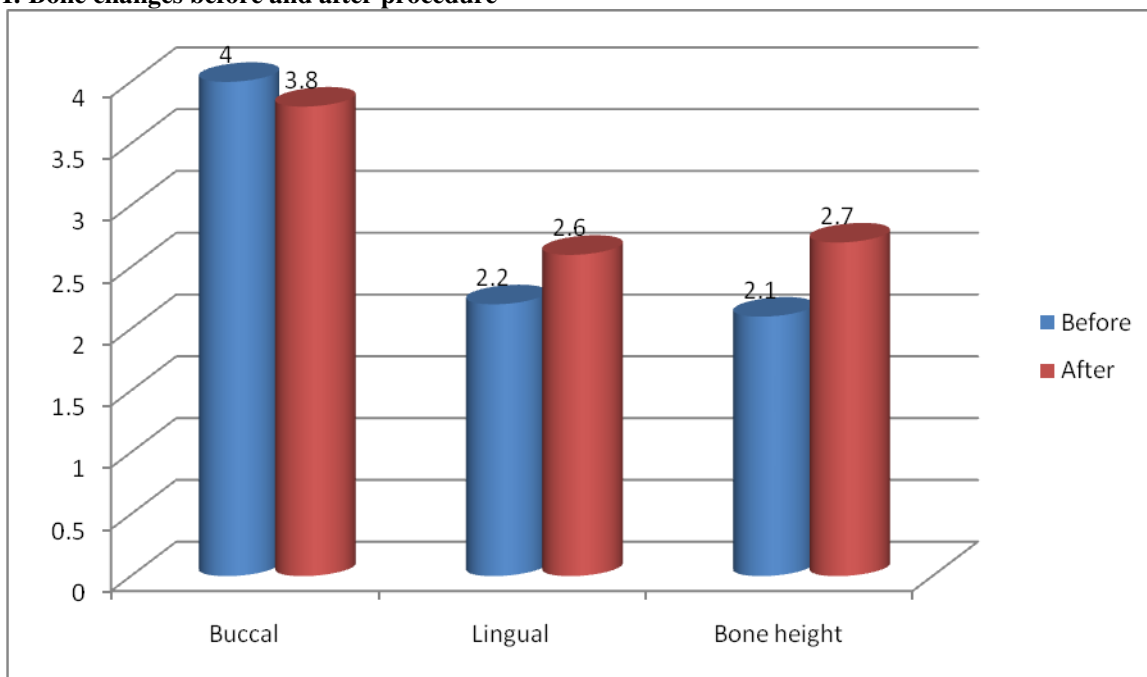
Table I shows that out of 72 patients, males were 40 and females were 32.

Table II Bone changes before and after procedure

| Marginal bone level | Before | After | P value |
|---------------------|--------|-------|---------|
| Buccal | 4.0 | 3.8 | 0.51 |
| Lingual | 2.2 | 2.6 | 0.02 |
| Bone height | 2.1 | 2.7 | 0.01 |

Table II, graph I shows that marginal bone level on buccal side before procedure was 4 mm which decreased to 3.8 mm after treatment. On lingual side, it was 2.2 mm and 2.6 mm before and after procedure. Bone height showed significant increase from 2.1 mm to 2.7 mm ($P < 0.05$).

Graph I: Bone changes before and after procedure



DISCUSSION

Many orthodontic patients have posterior spacing due to missing mandibular teeth. Excluding the third molars, the mandibular second premolar is the most common congenitally absent tooth, which is reported to occur in 2.5-5% of the population in the USA and Europe. Such absence ensues bilaterally in 60% of instances. There is an assortment of treatment options if the problem is diagnosed early during the period of mixed dentition. These treatment modalities can be broken down into two main groups based on the decision to keep or extract the primary molars. The Orthodontist must make the proper decision at the appropriate time regarding management of the edentulous space.⁴ If space is left for an eventual prosthetic replacement, the clinician should try to create the exact amount of space required and leave the alveolar ridge in an ideal condition for the future restoration. If the space is to be closed orthodontically, molar protraction can be an alternative to restoration with posterior dental implants or fixed partial dentures. Intraoral skeletal anchorage (miniplates, screws) provides absolute anchorage for various tooth movements without requiring patient cooperation and anchorage preparation and

gets predictable treatment results more rapidly.⁵ The present study was conducted to assess bony changes following molar mesialization.

We found that out of 72 patients, males were 40 and females were 32. The marginal bone level on buccal side before procedure was 4 mm which decreased to 3.8 mm after treatment. On lingual side, it was 2.2 mm and 2.6 mm before and after procedure. Bone height showed significant increase from 2.1 mm to 2.7 mm ($P < 0.05$).

Kyung⁶ stated that space closure of the mandibular first molar area is seldom possible due to risks of dehiscence, fenestration, alveolar bone support loss, anchorage loss, devitalization, root resorption could move forward through the edentulous areas, but this generally required skeletal anchorage for anchor reinforcement because anterior dental anchorage is inadequate to protract even a single first molar without reciprocal retraction of the incisors or movement of the dental midline. In this study, the edentulous space of all participants was closed completely without skeletal anchorage reinforcement. In general, a temporary anchorage device is recommended for patients without cooperation, but in this study, we encouraged patients to wear the elastic in combination with wire bending to control the anchor. The

mean anchorage loss was 14.46%. Mesialization of the second molar was carried out using a segmented arch wire combined with Z bends and was reinforced with Class II elastic to minimize anchorage loss on the anterior region. The mean rate of mandibular molar protraction in this study was 1.23 mm/month. Jacobs et al.⁷

CONCLUSION

Author found increase in lingual marginal bone and height of bone after performing procedure.

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