EARLY EXTRACTION SPACE CLOSURE USING MINISCREW ANCHORAGE

Beycan K1*, Alcan T2, Acar A1

1. Marmara University, Faculty of Dentistry, Department of Orthodontics, Istanbul, Turkey
2. Private Practice, Istanbul, Turkey

Correspondence: Dr. Kadir Beycan, Marmara University, Faculty of Dentistry, Department of Orthodontics, Istanbul, Turkey
Email: orthodony@hotmail.com


ABSTRACT

This case report presents the closure of early extraction space of a dentally and skeletally Cl I patient with a miniscrew. The patient, 17-years-old male, complained of lingually positioned upper left lateral incisor and lower diastema due to early extraction of lower left first molar is reported. Treatment objectives were to correct dental relationship, align the dental arches and close the diastema. The treatment plan included the use of miniscrew as anchorage to close the diastema by mesialization of lower left posterior teeth after aligning the arches. The miniscrew anchorage was stable for the entire duration of the treatment and the final occlusion was improved, both functionally and esthetically. The miniscrew anchorage successfully aided in the closing the early extraction space without any side effects on the lower arch.

Keywords: Extraction, miniscrew

INTRODUCTION

Mandibular molars are difficult to move mesially because the mandible is comprised of thick cortical bone connected by a coarse trabecular bone, and the molar roots are extremely wide buccolingually1. Anchorage control is important in the treatment of these patients because lingual tipping of the mandibular incisors and midline shift must be prevented while protracting the second molars. In recent years, orthodontic miniscrews, which are convenient and simple, are used to protract posterior teeth without any side effects on anterior teeth2-4. This case report presents the closure of atrophic first molar extraction space with protraction of the mandibular second molar and third molar via a miniscrew without any side effects.
CASE REPORT

Diagnosis and Treatment Objectives:

The 17-year-old male patient’s chief complaints were crowding and lower space, occurred due to the early extraction of lower left first molar. He had a symmetrical face, competent lips, average smile, a normal smile line and a convex profile with protrusive upper and lower lips (Figure 1). The patient was dentally Class I on the right side and had no molar relationship on the left. The cephalometric analysis showed Class I skeletal relationship, with both retrognathic maxilla and mandible, retroclined upper and lower incisors. The panoramic radiograph revealed that lower right third molar and upper third molars were impacted (Figure 2, A). Treatment objectives were to correct dental relationship, align the dental arches and close the extraction space. The treatment plan included the use of a miniscrew as an anchorage for closing the space.

Figure 1. Pretreatment extraoral and intraoral photographs.
Early extraction space closure using miniscrew anchorage

Treatment Progress:

After aligning and leveling of the upper and lower arches, 0.016 x 0.022-in stainless steel wires were placed; 1 month later one miniscrew (7 mm long, 1.8 mm in diameter, O.S.A.S.; Dewimed, Tutlingen, Germany) was inserted between lower left premolar teeth. Before the force application lower stainless steel wire was taken out and in order to facilitate the mesialization, it was beveled at the corners. The screw was loaded immediately via closed coil spring exhibiting 150 g of force (Figure 3, A).
Figure 3. A, beginning of protraction with miniscrew; B, 3 months after application; C, 6 months after application; D, 10 months after application.
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Results:

Ten months later the diastema was closed (Figure 3, A-D). A Class I molar and canine relationship as well as aligned and coordinated dental arches were achieved at the end of 18 months active fixed treatment (Figure 4). The posttreatment panoramic radiograph showed proper space closure and acceptable root parallelism with no signs of significant bone or root resorption (Figure 2, B).

DISCUSSION

This case demonstrated the clinical utility of miniscrew in orthodontic space closure of edentulous atrophic mandibular first molar site. The mandibular first molar is the most frequently lost tooth in adults. Molar protraction can be an alternative to restoration with posterior dental implants or fixed partial dentures. Recently, miniscrews have gained wider acceptability; their small size allows them to be placed in most anatomic locations so that force can be applied in any direction. In our patient, in order to close the gap we placed the miniscrew on the buccal alveolar bone between the roots of the premolars for easier accessibility and better oral hygiene maintenance.
Stepovitch studied the changes in edentulous ridge before and after space closure of mandibular first molar spaces, he concluded that clinicians can close spaces of 10 mm or more in adults. Although the miniscrew remained stable throughout the protraction phase, discomfort from mild chronic inflammation is possible around the screw sites. These problems can be prevented if the screws are accurately positioned and careful oral hygiene is maintained with brushing and chlorhexidine treatment.

CONCLUSION

The miniscrew anchorage successfully aided in the closure of the early extraction space without any side effects on the lower dental arch. Treatment duration decreased significantly. It can be concluded that this treatment method is a viable alternative to restorations with the posterior dental implants or fixed partial dentures.

CONSENT

The authors obtained written, informed consent from the patient for the publication of this article.

COMPETING INTERESTS

Not declared.

REFERENCES