Intrusion of Over-erupted Upper First Molar Using Two Orthodontic Mini screws – A Interdisciplinary Approach

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ABSTRACT:
Overeruption of mandibular molars due to the loss of antagonist teeth causes occlusal functional disturbances. To restore proper occlusion, intrusion of the overerupted molars becomes essential before multidisciplinary reconstructive dental approaches can be initiated. In this case report, a minimally invasive, noncompliant clinical procedure for maxillary molar intrusion using two orthodontic miniscrews is discussed in a patient who require molar intrusion for prosthetic purpose in lower posterior region.

Key words: Disinfection, Immersion, Iodophor.

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INTRODUCTION
Despite the increasing demand of adult orthodontic care, many adults are worry of visible conventional braces, particularly in the upper arch. The orthodontist is often faced with the challenge of correcting the localized occlusal problem while working within the esthetic demands of the patient and treatment duration demands of the referring dentist, neither of whom may recognize the extent of treatment difficulty.

Loss of the mandibular first molar often results in overeruption of the opposing maxillary first molar, resulting in occlusal interference and functional disturbances, compromised periodontal health, and increased complexity of restoring the edentulous space.

Generally, several conventional options are available to increase occlusal clearance. Coronal reduction often requires crown restorations at the expense of tooth vitality. Another alternative is a posterior segmental osteotomy of the maxilla to impact the elongated segment, but patients must undergo the risk of general anesthesia and high cost associated with this procedure.

To intrude overerupted maxillary molars, orthodontic anchorage could be prepared by incorporating multiunit teeth, adding extraoral headgear wear, or using newly adopted mini-implants as bony anchorage. High-pull headgear may achieve intrusion of maxillary posterior teeth, but the treatment result depends heavily on patient compliance.

Recent reports have demonstrated the clinical efficiency of mini-implants in providing sufficient anchorage against orthodontic forces. The advantages of using mini-implant as orthodontic anchorage include ease of application, minimal patient compliance needed, and the ability to immediately load after initial wound healing. The surgical procedure for inserting or removing the miniscrew is simple, with minimal unfavorable complications. In contrast, miniplates require flap surgery often done by oral surgeons.

In this case report, a minimally invasive, noncompliant clinical procedure for maxillary molar intrusion using two orthodontic miniscrews is discussed in a patient who require molar intrusion for prosthetic purpose in lower posterior region.

CASE REPORT
An adult female patient aged 32 years reported prosthetic department at the Genesis institute of dental sciences Ferozepur seeking replacement of missing teeth in lower right quadrant. Patient was referred to Department of Orthodontics, as over-eruption of upper first molar hampering the proper placement of fixed prosthesis in lower region. The patient was medically fit and healthy.

The objective of the treatment was to intrude the overerupted molar utilizing miniscrew implant anchorage and subsequently regaining the appropriate dental space for prosthesis.
**Treatment plan**
The treatment plan, with the patient’s informed consent, was to orthodontically intrude the suprarupted teeth with two mini implants placed on buccal and palatal side of extruded tooth.

**Progress of Molar Intrusion**
Two orthodontic miniscrews (Dual Top; Rocky Mountain Orthodontics Inc, Denver, Colo), 1.4 mm in diameter and 8 mm in length, were placed in the maxillary buccal dentoalveolus and palatal slope. The buccal miniscrew was inserted between the first and second molar, at the level of the mucogingival junction. The palatal miniscrew was inserted between the second premolar and first molar, just medial to the greater palatine nerve. Both miniscrews were placed using only local anesthetic.

The miniscrews were immediately loaded with 100 g of intrusive force using a closed elastic power chain (Rocky Mountain Orthodontics Inc, Denver, CO). To prevent the elastic chain from slipping off the miniscrew head, elastic o-rings were placed on top of the chain. Patient was on regular monthly follow ups and E chain was changed on each appointment to maintain the sufficient force level.

After 6 months of treatment, the patient presented with approximately 2.5 mm of intrusion was achieved. Subsequently, the occlusal clearance was sufficient to rebuild the posterior occlusion by a prosthesis placed in the area of the missing antagonistic tooth. Because the intraoral strap-up was minimized, the patient was able to follow oral hygiene instruction and, furthermore, was pleased with the simplified mechanical devices. Due to financial reasons, the patient had opted for fixed bridge prosthesis.
DISCUSSION
To intrude the supraerupted maxillary molar, one miniscrew was placed in the buccal dentoalveolus between the first and second molar at the level of the mucogingival junction; the second was placed in the palatal slope between the second premolar and first molar just medial to the greater palatine nerve. The largest amount of maxillary interradicular bone in the mesiodistal direction, buccally and palatally, is between the second premolar and first molar. The palatal miniscrew was placed mesial to the first molar to avoid the greater palatine foramen and the porous trabecular D4 bone found in the posterior maxilla. Adequate interradicular room and attached gingival was present distal to the first molar to allow for placement of a buccal miniscrew. The ideal location for placement of a palatal miniscrew is in the midline suture or the paramedian region. The palatal midline is typically composed of thick cortical D1 bone covered with 1-mm thin attached gingiva. To allow for equal buccal and palatal intrusive force, an extension arm is needed to reach the palatal slope. Placement of the miniscrew directly within the palatal slope may increase the risk of nerve involvement and stationary anchorage failure due to the thin cortical D3 bone and thick overlying tissue. In the case presented, the miniscrew was placed in the palatal slope rather than the paramedian region to eliminate the need for an extension arm.

CONCLUSIONS
• A supraerupted maxillary molar can be successfully intruded using two orthodontic miniscrews.
• Short-term molar intrusion can be achieved without clinically detectable apical root resorption.
• By using orthodontic miniscrews and a brief period of partial fixed appliances to correct a localized occlusal problem, the patient’s dental anxiety was minimized, her restorative treatment finances were reduced, and tooth enamel and vitality were protected.

REFERENCES

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