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Case Report

Dentistry Section

Periodontal Intervention in Speedy Orthodontics-A Case Report

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ABSTRACT

The use of orthodontic treatment in adult patients is becoming more common and these patients have more specific objectives and concerns related to facial and dental aesthetics, specially regarding duration of treatment. Dentists are on the lookout for techniques for increased efficiency in orthodontic treatment. Alveolar Corticotomy-assisted orthodontic treatment is a recent orthodontic technique that is recently gaining wide acceptance and is recorded as effective means of accelerating orthodontic treatment. A 17-year-old female patient was undergoing orthodontic treatment for the past one year but during her space closure, a visual examination confirmed a buccal thickening that was encountered in the buccal plate between premolars and canine. Periodontal intervention involved elective alveolar decortication in the form of dots performed around the teeth that were to be moved. This was carried out to induce a state of increased tissue turnover and a transient osteopenia, which further helps in faster rate of orthodontic tooth movement. Its main advantages are reduction of treatment time and post-orthodontic stability.

Keywords: Osseous remodelling, Periodontium, Wilkodontics

CASE REPORT

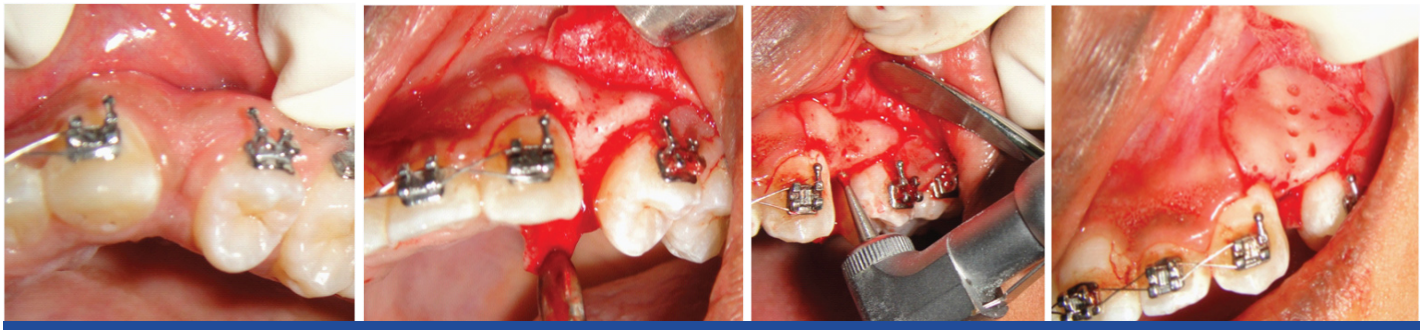
A 17-year-old female patient was sent to the OPD of Department of Periodontics for treatment options available for rapid movement of the premolars in the upper left quadrant. She had been undergoing orthodontic treatment for the past one year but during her space closure, a visual examination confirmed a buccal thickening that was encountered in the buccal plate between premolars and canine [Table/Fig-1]. On oral examination and with trans-gingival probing a thickened contour of the alveolar bone on the buccal side in between the premolar and the canine could be appreciated. A detailed case history revealed the medical and family history to be non significant. Consent was taken from the patient and a corticotomy procedure was planned out for remodelling of the bone, as forward movement was not appreciated for a period of 5 months which henceforth would result in a simultaneous stimulated rapid movement of the premolars in the forward direction.

Patient was given routine oral prophylaxis and was called after a week for the buccal corticotomy procedure. After administration of local anaesthesia a full thickness flap extending from the distal line angle of the canine to the mesial line angle of the premolar was raised. The flap was raised on both the buccal and the palatal sides so as to access the interdental bone and for properly visualization [Table/Fig-2]. Following this 2 mm holes at 3 mm distance from one another were drilled on the buccal as well as the interdental bone. Holes were drilled in the midline dissecting the area where the flap was raised. Next holes were also drilled on either side of the midline so that the whole area could undergo osseous remodelling that promotes rapid movement of teeth [Table/Fig-3,4]. Bleeding was elicited from these drilled holes and a depth of 1.5-2 mm was checked and confirmed [Table/Fig-5]. After the bleeding was arrested the flap was approximated [Table/Fig-6]. Orthodontic forces were installed for closure of the space immediately after surgical procedure. The patient was recalled after 1 week time for removal of the sutures.

Quick Orthodontic movement of 3mm was well appreciable over the next 2 months and both the orthodontist as well as the patient were satisfied with the results obtained [Table/Fig-7].

DISCUSSION

Wilkodontics, also known as Accelerated Osteogenic Orthodontics (AOO) is a relatively new treatment in the orthodontic realm. This technique has roots in orthopaedics, dating back to the early 1900s. Only recently was it modified to assist in orthodontic tooth movement [1]. The development of corticotomy-assisted orthodontics has provided new clarification to many limitations in the orthodontic treatment [2]. This treatment has gradually gained popularity as an additional treatment option for the orthodontic treatment of adults [3]. Because the primary resistance to tooth movement is encountered in the cortical layer, corticotomy makes it possible to move teeth faster without undesirable side effects [4]. Speedy orthodontics describes a protocol to allow movement of dental segments over a shorter time by using a corticotomy and an orthopaedic force with temporary anchorage devices [5]. The corticotomy generated biological stimulus is reflected in the



[Table/Fig-1]: Pre-operative view. **[Table/Fig-2]:** Full thickness flap elevated. **[Table/Fig-3]:** Holes being drilled in midline.**[Table/Fig-4]:** Holes drilled on either side of midline.

[Table/Fig-5]: 2mm Depth of holes checked with probe.
[Table/Fig-6]: Flap approximated and sutures given.
[Table/Fig-7]: Post-op view after 2 months.

structure of trabecular bone, which provides an opportunity to enhance orthodontic movements [6]. Active bone remodelling is seen due to the activity of the recruited osteoblasts in that area. During healing a localized osteoporosis is observed which accelerated the normal healing process by means of transient bursts of hard and soft tissue remodelling.

Alveolar corticotomies (ACS) are defined as a surgical intervention limited to the cortical portion of the alveolar bone. The corticotomy technique reduces treatment time when compared to conventional techniques by 30-50% [7,8]. The same results can be appreciated in the present case report also. We tried to achieve note worthy results by a modified, lesser invasive technique and no need of bone graft as used in conventional PAOO (Periodontally Accelerated Osteogenic Orthodontics) which is more invasive.

Corticotomy facilitated orthodontics has been employed in various forms over the past to speed up orthodontic treatments. Kole first introduced it as a mean for rapid tooth movement. It was assumed that the main resistance to tooth movement was cortical plates of bone and by disrupting its continuity, orthodontics could be finished in much less time than expected [9].

To amplify the rate of tooth movement, Periodontists have been using a corticotomy technique with inclusion of grafting procedure. Ren et al., evaluated the effects of alveolar interseptal corticotomy and extraction on orthodontic tooth movement in beagles. He observed that without any associated root resorption or irreversible pulp injury, the tooth on the experimental side moved more rapidly than the tooth on the control side. Also, active and extensive bone remodeling around the moved tooth was shown [10].

A direct correlation was found between the severity of bone corticotomy and/or osteotomy and the intensity of the healing response, leading to accelerated bone turnover at the surgical site [11]. This was designated “Regional Acceleratory Phenomenon” (RAP). RAP was explained as a temporary stage of localized soft and hard-tissue remodeling that resulted in rebuilding of the injured sites to a normal state through recruitment of osteoclasts and osteoblasts via local intercellular mediator mechanisms involving precursors, supporting cells, blood capillaries and lymph [11].

Suya recommended that after corticotomy orthodontic treatments should be completed in the first three to four months, before fusion of the tooth-bone units [12]. Wilcko et al., described an innovative strategy of combining corticotomy alveolar surgery with alveolar grafting in a technique referred to initially as AOO and more recently as PAOO [13].

The present technique used is a modification of the conventional corticotomy technique which serves beneficial since it is lesser invasive and eliminates the need of bone grafting. It is more economical and the patient compliance is greater. Our technique has never been reported in the literature, so cannot be commented. We need to carry out this technique on larger sample size to know the rate of replase.

CONCLUSION

Most of the individuals desire a quick orthodontic treatment. Traditional orthodontic therapy in adults often results in protracted treatment time to allay periodontal tissue concerns. Since the periodontal tissues are not able to overcome the resistance of the alveolar bone without damage to the periodontal ligament even an increase in orthodontic forces do not accelerate root movement. Corticotomy assisted orthodontics has been reported in a few clinical cases, and seems to be a promising adjuvant technique, indicated for many situations where traditional orthodontics fail to produce tooth movement or in the orthodontic treatment of adults without active periodontal pathology. It is a novel technique to achieve rapid orthodontic tooth movement and prove to be proficient from both the patients' and clinicians' standpoints.

REFERENCES

[1] Shetty NJ. Periodontally assisted osteogenic orthodontics: A review. *IAIM*. 2015;2(2):165-68.
[2] Hassan AH, AlGhamdi AT, Al-Fraidi AA, Al-Hubail A, Hajrassy MK. Unilateral cross bite treated by corticotomy-assisted expansion: two case reports. *Head & Face Medicine*. 2010;6:6.
[3] Hassan AH, Al-Fraidi AA, Al-Saeed SH. Corticotomy-assisted orthodontic treatment: Review. *Open Dent Journal*. 2010;4:159-64.
[4] Chung KR, Oh Y, Ko SJ. Corticotomy-Assisted Orthodontics. *Journal of Clinical Orthodontics*. 2001;35(5):331-39.
[5] Chung KR, Kim SH, Lee BS. Speedy surgical-orthodontic treatment with temporary anchorage devices as an alternative to orthognathic surgery. *American Journal of Orthodontics & Dentofacial Orthopaedics*. 2009;135(6):787-98.
[6] Oliveira DD, Oliveira BF, Soares RV. Alveolar corticotomies in orthodontics: Indications and effects on tooth movement. *Dental Press Journal of Orthodontics*. 2010;15(4):144-57.
[7] Aljhani AS, Zawawi KH. Non extraction treatment of severe crowding with the aid of corticotomy assisted orthodontics. *Case reports in dentistry*. 2012;2012:694527.
[8] Bhattacharya P, Bhattacharya H, Anjum A, Bhandari R, Agarwal DK, Gupta A, et al. Assessment of corticotomy facilitated tooth movement and changes in alveolar bone thickness - a ct scan study. *J Clin Diagn Res*. 2014;8(10):ZC26-30.
[9] Kole H. Surgical operations on the alveolar ridge to correct occlusal abnormalities. *Oral Surg Oral Med Oral Pathol*. 1959;12:515–29.
[10] Ren A, Lv T, Zhao B, Chen Y, Bai D. Rapid orthodontic tooth movement aided by alveolar surgery in beagles. *Am J Orthod Dentofacial Orthop*. 2007;131:160.e1–10.
[11] Frost HM. The regional accelerated phenomenon. *Orthop Clin N Am*. 1981;12:725–26.
[12] Suya H. Corticotomy in orthodontics. In: Hosl E, Baldauf A, editors. Mechanical and biological basics in orthodontic therapy. Heidelberg, Germany: Huthig Buch Verlag; 1991. pp. 207–26.
[13] Wilcko MT, Wilcko WM, Nabil F. Bissada An evidence-based analysis of periodontally accelerated orthodontic and osteogenic techniques: a synthesis of scientific perspectives. *Semin Orthod*. 2008;14:305–16.

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