CASE REPORT

Accelerated Orthodontics: Case Report

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ABSTRACT

Introduction: Wilkodontics is an attempt to achieve the best possible orthodontic treatment with the least amount of time. The vertical cuts or perforations made on the cortical plate, hastens tooth movement using the principal of "regional acceleratory phenomena".
Case report: Both cases presented show patient's with a severe bimaxillary protrusion. Mean rate of retraction was 1.24mm/month for the first case and the mean rate of retraction was 1.212mm/month for the second case respectively once the corticotomy cuts were made.
Conclusion: With the increase in adults opting for orthodontic treatment, wilkodontics is a viable treatment option for quick results with minimum root resorption.

Keywords: Accelerated orthodontics, Wilckodontics, bimaxillary protrusion

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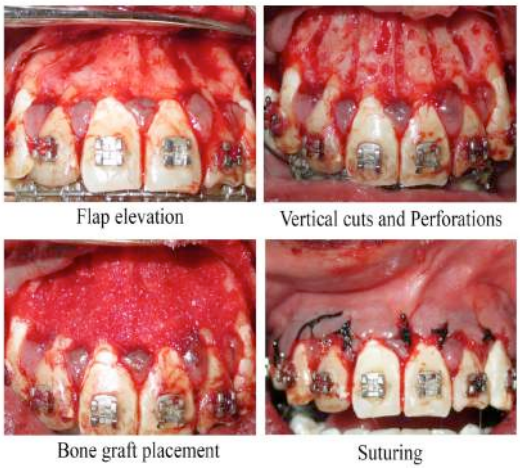
INTRODUCTION

The 21st century is referred to as the Century of the Biologist and the dentofacial dimension of the orthodontic specialty is a front stage player in the script of scientific progress.[1] Even though recent advances which include appliances that are more acceptable to patient, but still treatment duration is a matter of concern to adult patients. Interdisciplinary integration in the specialty of orthodontics has taken traditional orthodontic tooth movement (OTM) protocols and combined it with periodontal tissue engineering and regenerative surgery to devise a method that brings about rapid orthodontic tooth movement. Bryan described first corticotomy facilitated tooth movement in 1893. This procedure was later popularized by Kole[3] and Suya. This technique has been adopted or modified by most of clinicians for the current corticotomy procedures. In 2001, Wilcko et al[4] modified this corticotomy approach. This procedure was patented as accelerated osteogenic orthodontics (AOO™) or periodontally accelerated osteogenic orthodontics (PAOO™) or Wilckodontics™. This technique also reduces other side effects of fixed orthodontic therapy such as root resorption.

PROCEDURE

Following bonding of brackets initial phase of leveling and aligning is carried out with nickel titanium wires (0.016" round). After leveling and aligning, corticotomy is performed.
Full thickness flap is raised labially by preserving papilla from premolar extraction site of one side to the other in maxillary and mandibular regions. Vertical corticotomy cuts are placed in between the roots with No.1 tungsten carbide round bur under saline irrigation. Vertical cuts extended 2mm beyond apex and terminated 2mm short of alveolar crest. The vertical cuts are connected with a horizontal corticotomy cut in the apical region. Between vertical cuts, perforations are made in a random manner on cortical bone covering the radicular region. Depth of the cuts is maintained at 1.5mm to 2mm. Both vertical and horizontal cuts are made such that it extends

through cortical bone and barely into medullary bone.



PerioGlass™, which is a bioactive glass bone graft, is then placed over the cuts and perforations. Full thickness falp is then repositioned and sutured. Sutures are then removed two weeks post surgery and retraction is initiated.

Patients are recalled at every two week intervals for replacement of elastomerics.

CASE REPORT 1:

A 23 year old male patient sought orthodontic treatment in Department of Orthodontics, The Oxford Dental College and Hospital, Bangalore. The patient reported with chief complaint of proclined maxillary and mandibular anteriors. Patient's medical and family history was not contributory. On clinical examination it was revealed that, patient had severe proclination and mild spacing in maxillary anterior region and mild crowding and proclination in mandibular anterior region.

Patient was diagnosed with Angle's Class I malocclusion with bimaxillary proclination. Treatment objectives were to achieve ideal overjet and overbite and to finish the case in Class I canine and Class I molar relationship.

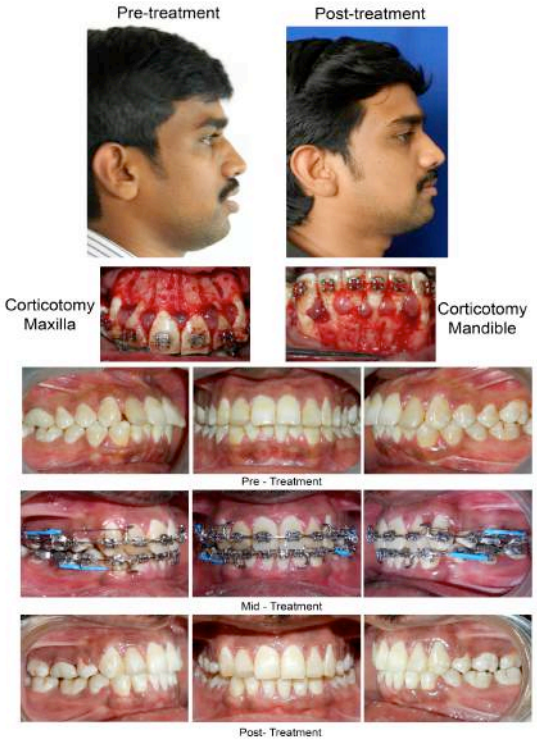
Patient was given following the treatment alternatives. First, extraction of maxillary and mandibular first premolar. Utilization of this space for the correction of proclination by retracting anterior segment. Second, extraction of premolars, followed by corticotomy after initial leveling and aligning. Retraction of maxillary and mandibular anterior segement for correction of proclination.

As patient was in favour for faster completion of orthodontic therapy, patient opted for second treatment modality. Corticotomy was performed before commencement of retraction. Extraction space was measured with digital vernier caliper.

Premolar extraction space closure in maxillary arch was achieved in 5months and in mandibular arch it was achieved in 4months.

Rate of retraction in first quadrant was 1.116mm/ month, in second quadrant was 1.265mm/ month, in third quadrant was 1.32mm/ month and in fourth quadrant was 1.272 mm/ month. Hence, mean rate of retraction was 1.24mm/month in this patient.

Case report-1



CASE REPORT 2

A 25 year old male patient reported to Department of Orthodontics, The Oxford Dental College and Hospital, Bangalore. On Clinical examination it was revealed that patient had convex profile, very mild crowding in maxillary and mandibular anterior region, severe proclination of maxillary and mandibular incisors, Class I canine relationship and Class I molar relationship. Hence, patient was diagnosed with Angle's Class I malocclusion with

bimaxillary proclination. Treatment objectives were to achieve ideal overjet and overbite and finish the case in Class I canine and Class I molar relationship.

Patient was given following treatment alternative. First, extraction of maxillary and mandibular first premolar. Utilization of this space for the correction of proclination by retracting anterior segment. Second, extraction of premolars, followed by corticotomy after initial leveling and aligning. Retraction of maxillary and mandibular anterior segement for correction of proclination.

Patient opted for second treatment modality. Hence, before commencement of retraction, corticotomy was performed. Extraction space was measured using digital vernier caliper.

Space closure in maxillary as well as mandibular arch was achieved in 5months. Rate of retraction in first quadrant was 1.232mm/month, in second quadrant was 1.21mm/month, in third quadrant was 1.2mm/month and in fourth quadrant was 1.212mm/month. Hence, mean rate of retraction was 1.212mm/month in this patient.

DISCUSSION

In Adult patients relatively longer treatment duration is seen in these types of cases. The reason for slower tooth movement being the slower bone remodeling in adults as compared to juvenile patients. Hyalinization and cessation of the tooth movement is seen when mechanical force level is increased. Therefore, the rationale for “speeding” the orthodontic tooth movement without increasing the force application should be based on accelerating the turnover rate of the alveolar bone.

Several novel modalities have been tried to accelerate orthodontic tooth movement for eg: low level laser therapy, pulsed electromagnetic fields, electrical currents, distraction osteogenesis, mechanical vibration ,and corticotomy is one such modality which is gaining acceptance in rest past.

Full thickness flap was raised by preserving papilla. This was done to maintain integrity of marginal bone, prevent recession and interdental bone loss.

Modification performed in corticotomy was, cuts and perforation were placed only on labial cortical plate. Wilcko et al.[1,7,8] have recommended placing cuts on both buccal and lingual cortical plate. Germec D[9] has recommended placing vertical cuts only on the labial cortical plate and then a chisel is used for reaching the lingual cortical plate from the labial side. Modification in placement of cuts was carried out to reduce the operation time and postoperative discomfort.

As there is no objective data to suggest any specific pattern, in placement of cuts to be superior for retraction of anterior teeth, vertical cuts were placed in the inter radicular region and perforations were made in a random manner.

To reduce patient discomfort maxillary and mandibular corticotomies were performed at an interval of one week. Antibiotics, NSAID’s and steroids were prescribed to enhance patient comfort and clinical healing. However, long term administration of NSAID’s is discouraged as it will interfere with regional acceleratory phenomenon. Mean rate of retraction observed was approximately 1.2mm/month in both the patients, which is indicative of acceleration of orthodontic tooth movement.[10-12]

Regional Acceleratory Phenomenon is normal localized response to a noxious stimulus in which tissue forms faster than the normal regional regeneration process. By enhancing healing stages, this phenomenon makes healing process 2-10 times faster than normal physiologic healing

(Frost, 1983). Acceleration in tooth movement is due to Regional Acceleratory Phenomenon (RAP).[5,6] No adverse effects on periodontium were observed following corticotomy procedure. The resultant faster tooth movement and decreased treatment, time, especially in adult patients are distinct advantages. However, additional cost with this procedure and morbidity with surgery are subjected to criticism.

CONCLUSION

Adult patients with bimaxillary proclination desiring early completion of orthodontic therapy can be given the option of corticotomy for faster tooth movement and early completion of treatment.

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