

REVIEW ARTICLE

REVIEW ON PERIODONTALLY ASSISTED ORTHODONTICS TREATMENT

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ABSTRACT: It is well known that most of the orthodontic treatments require more time for completion of the treatment. This technique literally accelerates the orthodontic corrections. Periodontally - assisted orthodontic treatment is an established and efficient orthodontic technique that has recently been studied in a number of publications. It has gradually gained popularity as an adjunct treatment option for the orthodontic treatment of adults. It involves selective alveolar decortication in the form of decortication lines and dots performed around the teeth that are to be moved. It is done to induce a state of increased tissue turnover and a transient osteopenia, which is followed by a faster rate of orthodontic tooth movement. Orthodontic treatment time with this technique will be reduced to one-third the time of conventional orthodontics. This technique has several advantages, including faster tooth movement, shorter treatment time, and safer expansion of constricted arches, enhanced post-orthodontic treatment stability and extended envelope of tooth movement. The aim of this article is to present a comprehensive review of the literature, including historical background, contemporary clinical techniques, indications, contraindications, complications and side effects.

KEYWORDS: Corticotomy, decortication, review, orthodontic treatment.

HISTORICAL REVIEW: Surgically assisted orthodontic tooth movement has been used since the 1800s. Corticotomy-facilitated tooth movement was first described by L.C. Bryan in 1893. However it was first introduced in 1959 by Kole.¹ As a mean for rapid tooth movement. It was believed that the main resistance to tooth movement was the cortical plates of bone and by disrupting its continuity, orthodontics could be completed in much less time than normally expected. Kole's procedure involves the reflection of full thickness flaps to expose buccal and lingual alveolar bone, followed by interdental cuts through the cortical bone and barely penetrating the medullary bone (corticotomy style). The subapical horizontal cuts connecting the interdental cuts were osteotomy style, penetrating the full thickness of the alveolus. Because of the invasive nature of Kole's technique, it was never widely accepted.²

Wilcko developed a patented technique called Accelerated Osteogenic Orthodontics (AOO) or Periodontally Accelerated Osteogenic Orthodontics (PAOO). This technique is similar to conventional corticotomy except that selective decortication in the form of lines and points is performed over all of the teeth that are to be moved. In addition, a resorbable bone graft is placed over the surgical sites to augment the confining bone during tooth movement. After a healing period of one or two weeks, orthodontic tooth movement is started and then followed up using a faster rate of activation at two week intervals.

The reason for placing graft is, in maxillary expansion cases or in lower incisor labial segment he found fenestrations or dehiscence and thus, grafts would prevent this complications. Orthodontic

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therapy facilitated with corticotomy surgery and grafting improved alveolar bony support and resulted in permanent alveolar process width increase.³

3. PROCEDURE: The PAOO technique is an in-office outpatient treatment that combines both periodontal surgery and orthodontics.

Role of Orthodontist: Orthodontic appliances are put on a few days before the PAOO procedure. After proper case selection, orthodontic appliances are better to be placed one week prior to the surgery. Standard brackets, arch wires, and normal orthodontic force level can be used.⁴

Role of Periodontist: Under Local anesthesia, incisions are given and the flap is reflected. Usually a full thickness flap is reflected. Esthetic factors are to be considered while raising the flap. Vertical incisions are to be made at least one tooth away from the area to be decorticated. Decortication lines and points are made for up to 0.5 mm depth. Selective medullary penetration should also be made to enhance bleeding. The decortications consist of removing the cortical part of the bone alone without involving the cancellous bone. Round bur is used for this purpose. If needed bone grafts mixed with antibiotics can be given accordingly. Flaps are put back in place and sutures are given. Sutures should be in place for a period of two weeks.

3.3. Post-Operative Instructions The patient is put on soft diet. Antibiotics, analgesics and mouth rinses are given. To reduce the post-operative swelling ice packs are given immediately after surgery. Necessary medications can also be given as per the requirement. Recovery takes 7-10 days.⁵

3.4. Role of Orthodontist: Orthodontic treatment after surgery includes that the orthodontic forces should be applied immediately after the surgery, as it was found to be the best time to initiate the movement. But some prefer to start the tooth movement two weeks after the surgery. The orthodontist adjusts the appliances once in every two weeks. Depending upon the individual cases, the orthodontic correction will be over in four to ten months. These procedures were found to reduce the treatment time required for the correction of Crowding and they accelerate canine retraction after premolar extraction. Molar intrusions and open bite corrections can also be carried out at a faster pace with this technique.⁵

4. MODIFICATIONS: It is not always necessary to carry out the periodontal surgical procedure for the full mouth. The surgical procedure can be confined to the site where it is needed as determined by the orthodontist. Also the surgical procedure can be split into two procedures and can be carried out in two separate appointments to reduce the complication of necrosis. It can be used to expedite the rate of movement of individual teeth or dental segments.⁶

Considerations for the PAOO procedure:

Orthodontic considerations:

(Class I and II malocclusions)

- All of the permanent teeth have been fully erupted or near to fully erupted.
- No significant root resorption.
- Co-operative patients recommended.

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- There should be no ankylosed teeth present.
- (Class II malocclusions only)**
- In Class II div 1 extraction/retraction cases, avoid situations where the anterior teeth have the proper upper incisal angle or are in a more upright position.

Periodontal considerations:

(Class I and II malocclusions)

- The pt. should present with a healthy periodontium.
- There should be no significant periodontal pocketing.
- There should be no more than minimal bone loss present.
- There should be no worse than class I furcation involvement.
- There should be no major restricted jaw opening and no active TMJ problems.⁷

ADVANTAGES:

1. Appliances are worn for a lesser time by the patient.
2. The need for extractions is reduced.
3. When compared to traditional techniques chances of root resorption is less.
4. Tooth movement is faster.
5. Safer Expansion of Constricted Arches.
6. Except for severe Class III skeletal dysplasia, Periodontally Accelerated Osteogenic Orthodontics can replace orthognathic surgery to the extent as determined by the Orthodontist.

Contraindications and Limitations: Patients with active periodontal disease or gingival recession and medically compromised patients are the contraindication for the procedure.

Complications and Side Effects: The adverse effects to the periodontium after corticotomy, ranging from no problems to slight interdental bone loss and loss of attached gingival, periodontal defects, some postoperative swelling and pain is expected for several days and hematoma and facial edema in some patients.

CONCLUSION: PAOO is a promising technique that has many applications in the orthodontic treatment of adults because it helps to overcome many of the current limitations of this treatment, including lengthy duration, potential for periodontal complications. This is an adjuvant technique, indicated for many situations in the orthodontic treatment of adults. It has been used in some limited cases to avoid secondary effects of conventional orthodontics, such as root resorption in molar intrusion or periodontal dehiscence in slow tooth expansion. However, its main advantages are reduction of treatment time and post orthodontic stability, which may allow its generalized use in many adult patients without active periodontal pathology.

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