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# Wilckodontics: Periodontally Accelerated Osteogenic Orthodontics

## -A quicker way to deliver smiles

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## ABSTRACT:

The utilisation of orthodontic force, particulate bone grafting, and corticotomy are all components of the clinical technique known as Wilckodontics, sometimes known as periodontally accelerated osteogenic orthodontics (PAOO). Teeth can be induced to migrate quickly through bone by activating and using the natural capacities of live bone. The bone that surrounds the tooth roots rebuilds itself once the tooth has moved to its new position. The Wilckodontics procedure was developed by Drs. Thomas and William Wilcko, both orthodontists, and is protected by patent under the term Wilckodontics. Not only for the orthodontist and periodontist, but also for the patient in particular, this technique may be a win-win treatment.

## INTRODUCTION:

One of the main reasons people don't get orthodontic treatment is that it takes a long time. Adult patients are increasingly seeking orthodontic treatment and want their braces removed as soon as possible[1]. Adult growth is almost non-existent in comparison to that of children. Additionally, adults are more likely than adolescents to experience hyalinization[2]. Because of all of these factors, orthodontic treatment for adults is a more difficult treatment option in dentistry.

"Periodontally accelerated osteogenic orthodontics (PAOO)", also known as "Wilckodontics", is a classic connection between orthodontics and periodontics. In this type of treatment, alveolar corticotomy is used to accelerate orthodontic tooth movement. Because the alveolar bone is a mineralized structure that is easier to change than cementum, orthodontic tooth movement can be done 2-3 times faster in 1/3 to 1/4 of the time it would normally take. However, the regional acceleratory phenomenon (RAP) is the primary focus of this procedure[3]. As a result, it satisfies the periodontal tissue engineering and regenerative surgery protocol and reduces side effects such as infection and root resorption.

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## LITERATURE REVIEW:

Wilcko et alevaluation.'s of two patients in 2001 showed that this technique may concurrently reshape and expand the buccolingual thickness of the supporting bone and that it also offers quick treatment times. [4]

In addition to Le Fort 1 orthognathic surgery, Guiol et al. (2013) also performed a surgical procedure for maxillary autogenous bone grafting. Their findings demonstrated enhanced and uneventful healing without excessive morbidity. [5]

Two patients with significant bimaxillary protrusion were the subject of a case report by Tan et al. in 2015. Using this technique, the mean retraction rate in the first case was 1.24 mm/month, whereas in the second case it was 1.212 mm/month. They thus concluded that Wilckodontics is a therapy option with immediate results.[6]

Cheung et al. (2016) examined the effects of rat mini-implant-facilitated "micro-osteo-perforation (MOPs)". Mini-implants were discovered to assist MOPs and hasten tooth movement without raising the danger of root resorption. [7]

In order to evaluate the effectiveness of corticotomy and piezocision in canine retraction, Viwattanatipa and Charnchairerk (2018) carried out a systematic study. They came to the conclusion that this method improved treatment outcomes and patient satisfaction.[8]

**Rapid acceleratory phenomenon [RAP]**

Harold Frost, an orthopaedist, knew that when osseous or soft tissue surgery wounds hard tissue, there is a lot of reorganizing activity near the wound site. According to Frost (1983), this chain of physiologic healing events was collectively referred to as the regional acceleratory phenomenon (RAP). Frost[3] pointed out that the initial injury somehow sped up the normal processes of healing in the region. The regional acceleratory phenomenon is this acceleration. Typically, RAP takes place following a fracture, arthrodesis, osteotomy, or bone grafting procedure. It may involve the recruitment and activation of wound-healing precursor cells concentrated at the injury site. Reduced regional bone density and accelerated bone turnover, which are thought to make it easier for orthodontic teeth to move, are the two main characteristics of RAP in bone healing. Within a few days of the injury, the RAP begins, typically reaches its peak at one to two months, typically lasts four months in bone, and may persist for six to more than 24 months. The RAP lasts as long as there is tooth movement. The osteopenia goes away and the radiographic image of normal spongiosa comes back when RAP goes away. An environment that encourages alveolar re-mineralization is created after orthodontic tooth movement is completed. The week prior to the surgical component of PAOO, orthodontic brackets are typically positioned and arch wires are activated. After surgery, orthodontic force should never be applied more than two weeks late. A longer delay will not make the most of the limited time that the RAP is taking place. The amount of time the orthodontist has to achieve accelerated tooth movement is limited. Typically, this period

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lasts between four and six months, after which finishing movements proceed normally. The orthodontist will need to move arch wire sizes quickly because there is only a limited "window" of rapid movement.[4]

“Criteria for Patient Selection

**INCLUSION CRITERIA**

- Class 1 malocclusion with moderate to severe crowding or constricted maxilla.
- Severe bimaxillary protrusion.
- Mild class III malocclusion.
- Class II malocclusion requiring expansion.
- Molar up righting.
- Facilitate eruption of impacted teeth.

**EXCLUSION CRITERIA**

- Patient having active periodontal disease.
- Severe class III cases.
- Patients having osteoporosis or other bone diseases.
- Patients under long-term medication such as steroids or nonsteroidal anti-inflammatory drugs (NSAIDs).
- Patients with systemic diseases.

These are the inclusion and exclusion criteria of this research paper”.

**Periodontally Accelerated Osteogenic Orthodontics**

A crevicular incision is done under local anaesthesia, extending at least two teeth beyond the main area to be treated, after the correct case selection and orthodontic bracket insertion (1 week prior to the surgery).[9]

**Flap**

In the coronal and lingual regions, full-thickness flaps are carefully reflected, whereas partial-thickness flaps are raised in the apical region to allow flap mobility during suture. The interdental papilla is preserved for aesthetic reasons in the maxillary central incisor area. Following the reflection of the flap, thorough debridement and curettage are performed.[10]

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### Decortication

Alveolar bone activation is done using a number 1 or 2 round bur or piezoelectric knife with selective decortications.

### Grooving

In Interradicular spaces, vertical grooves are placed that run 2 to 3 mm below the alveolar crest to 2 mm past the apices of the roots. These vertical corticotomies are subsequently joined by a circular horizontal corticotomy.[10]

### Particulate Bone Grafting

A coating of particulate bone grafting material is applied to the activated bone after activation. To facilitate placement, the powdered bone grafting material is moistened with a clindamycin phosphate solution, platelet-rich plasma, or a bacteriostatic water solution containing approximately 5 mg/mL. 11 Bone grafting frequently involves the use of deproteinized bovine bone, autogenous bone, demineralized freeze-dried bone graft, or a mix of the three.[10]

### Flap Closure

A non-resorbable material is used to approximate the flaps with interrupted loop sutures. The flap ought to be closed with little tension. The optimal time for the establishment of the epithelial attachment is two weeks, after which the suture is removed.[12]

Postsurgical management: Antibiotics, analgesics, mouthwash, and application of an ice pack (in case of swelling following surgery) are all outlined in the instructions.[12]

**Advantages** 1. Fewer chances of relapse, shorter treatment times, and an acceleration in tooth movement. 2. Less likelihood of root resorption. 3. Brackets made of ceramic, gold, or metal can be used. 4. The patient experiences less discomfort as the tooth moves through the softened bone.

**Disadvantages** 1. More expensive than traditional braces. 2. Increase in the possibility of pain, swelling, and infection following surgery. 3. Additional surgery is required.

## ADVANCES:

Laser: Laser-assisted corticotomy is seen as a beneficial procedure because of how non-invasive it is. It employs the Er-Cr-YSGG (erbium, chromium-doped yttrium scandium gallium garnet) laser to remove cortical bone without generating flap reflection, hence minimising the need for surgical intervention.[13]

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## CONCLUSION:

The PAOO method takes less time to treat than traditional orthodontics. Additionally, studies indicate that bone grafting results in an increase in alveolar bone thickness, which improves post-orthodontic stability and reduces the likelihood of root resorption. However, one should always keep in mind that for successful treatment that would reduce treatment time with minimal damage to supporting tissue and teeth, there should be good coordination between orthodontists and periodontists for case selection, diagnosis, and treatment planning.

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