

# Modified Alveolar Corticotomy-Facilitated Orthodontic Treatment: A Case Series

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## Abstract

Traditionally, the orthodontist dealt with correcting malocclusions in growing patients however an increased awareness among adult patients for dentofacial aesthetics has resulted in a huge demand for orthodontics in the adult population. However, successful orthodontic treatment can be difficult when treating adult patients since dentoalveolar development ceases after adolescence. Short treatment time is a constantly recurring request by many adult patients, hence clinicians have searched for alternative methods to accelerate tooth movement. Therefore the aim of the present study was evaluation of modified alveolar corticotomy-facilitated orthodontic treatment in adult patients with bimaxillary protrusion. Three patients with the age range of 24-30 years having class I malocclusion with Bimaxillary protrusion were included.

**Keywords:** Wilkodontics, corticotomy, PAOO, Orthodontic, bimaxillary protrusion, RAP.

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## INTRODUCTION

Currently, a number of patients seeking orthodontic treatment during adulthood to correct esthetic and occlusal aberrations are increasing significantly. However, successful orthodontic treatment can be difficult when treating adult patients since dentoalveolar development ceases after adolescence. The average orthodontic treatment time for adults is considerably longer than for adolescent patients, ranging from 18.7 to 31 months [1]. Short treatment time is a constantly recurring request by many adult patients, hence clinicians have searched for alternative methods to accelerate tooth movement. Surgically assisted orthodontic tooth movement has been used since the 1800s. Corticotomy-facilitated tooth movement was first described by L.C. Bryan in 1893 [2].

In the 1990s, the Wilcko brothers, using computed tomography and discovered that reduced mineralization of the alveolar bone was the reason behind the rapid tooth movement following corticotomies. They used their knowledge of corticotomy and their observations of Regional acceleratory phenomenon (RAP) and patented the procedure as periodontally accelerated osteogenic orthodontics (PAOO) technique in 1995. Therefore the aim of the present study was evaluation of modified

alveolar corticotomy-facilitated orthodontic treatment in adult patients with bimaxillary protrusion.

## METHOD AND MATERIALS

Three patients with the age range of 24-30 years having class I malocclusion with Bimaxillary protrusion, crowding in upper and lower anteriors, Presence of adequate amount of attached gingiva and no gingival recession, radiologically no evident bone loss were included in the study. However, Patients with unacceptable oral hygiene, smokers, pregnant women, Clinical or radiographic signs of untreated acute infection, apical pathology, root fracture, severe root irregularities, cemental tears, cemento-enamel projections not easily removed by odontoplasty, untreated carious lesions at cemento-enamel junction (CEJ) or on the root surface at the selected site were excluded from the study.

### Clinical Measurements

The clinical measurements taken were Probing pocket depth, gingival recession and width of attached gingiva.

### Surgical Procedure

Prior to the surgical procedure, the patients were instructed to rinse with 0.2 % Chlorhexidine gluconate for one minute. The surgical protocol

emphasized complete asepsis and infection control. After induction of local anaesthesia, crevicular incision was given both labially and lingually. A full thickness flap was elevated using periosteal elevator. Vertical corticotomy was done using carborandum disc upto 4-5 mm depth. Horizontal cuts were then placed 2-3 mm apical to the root apex joining the vertical cuts. The flap was sutured to obtain a primary closure using of interrupted black silk 4-0 sutures after suture.

### Postoperative Care

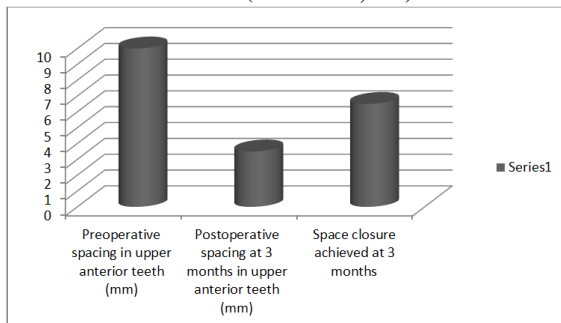
Immediately after surgery, NSAID's Tab. Ibugesic Plus (Ibuprofen 200 mg + Paracetamol 400 mg), t.i.d and systemic antibiotic Cap. Mox (Amoxicillin 500 mg), t.i.d was prescribed for 5 days during post-surgical period. Patients were instructed not

to brush the teeth for first 30 days after surgery at the treated sites. All patients were instructed to rinse with 0.2% chlorhexidine gluconate (Hexidine- ICPA) twice daily, for 2 weeks.

### RESULTS

Ideal aesthetic and functional results were achieved in 3 months with one-third the average treatment time without detrimental periodontal effects such as gingival recession and periodontal pockets. There was good preservation of interdental papilla and maintenance of adequate zone of attached gingiva. In the present study, significant space closure of 6.5 mm was achieved in all the 3 cases at 3 months.

**Table-1: Measurements of Space available between Maxillary Anterior (Mean  $\pm$  S.D, mm)**



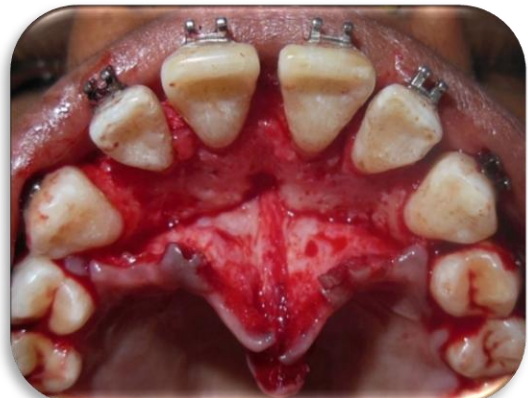
**Fig-1: Preoperative view**



**Fig-2: Crevicular incisions placed both buccally and palatally**



**Fig-3: After reflection of buccal flap**



**Fig-4: After reflection of Palatal flap**



**Fig-5: Vertical corticotomy labially using carborundum disk upto 4-5 mm depth**



Fig-6: Vertical corticotomy Palatally using carborundum disk upto 4-5 mm depth



Fig-8: Flap sutured apical to root apex joining the vertical cuts



Fig-7: Horizontal cuts were made 2-3 mm



Fig-9: Post-operative view

## DISCUSSION

Reduction of orthodontic therapy time is considered to be an important goal in the management of malocclusions. Corticotomy-facilitated orthodontic treatment has found to be an effective method for maximum anchorage cases in adult patients who desire a shortened orthodontic treatment period. Gantes *et al.*, [3] treated five adult patients having interdental spacing with maxillary anterior using corticotomy-assisted orthodontic technique and reported a mean treatment time of 4.8 months. Nowzari *et al.*, [4] PAOO was an effective treatment approach in adults to decrease treatment time and reduce the risk of root resorption using a modified surgical approach and limiting the corticotomy to the buccal and labial aspects.

In the present study, significant space closure of 6.5 mm was achieved in all the 3 cases at 3 months. There were no significant periodontal adverse effects like, reduction in the crest bone height, decrease of attached gingiva and apical root resorption were noted. In addition, no signs of mobility and devitalization of teeth were noted. This was consistent with the findings reported by Machado I [5].

## CONCLUSION

From the present case report it can be implied that by combining the talents of the periodontists and orthodontist, we now have a viable and safe orthodontic treatment that can be completed in a fraction of time.

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