Piezoincision with Soft Tissue Grafting- A Novel Technique In Periodntally Aaccelerated Osteogenic Orthodontics (PAOO)

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Abstract: Periodontally accelerated osteogenic orthodontics (PAOO) is a procedure that combines selective alveolar decortication, placement of bone graft on decorticated areas, and the application of adequate orthodontic forces. PAOO reduces one third of treatment time which is normally required for conventional orthodontic treatment. But the major disadvantage of conventional technique is inability to perform soft tissue coverage for treatment of gingival recession at the same time. Piezoincision with soft tissue grafting method overcomes this disadvantage. Only few case reports are published on this technique. This case report highlights the novel technique in Wilckodontics. [Pavan A NJIRM 2017; 8(6):98-101]

Key Words: Gingival recession, Orthodontics, Corticotomy, Piezosurgery, Tooth movement

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Introduction: Malpositioned teeth are responsible for esthetic and occlusal aberrations in many adults. patient often avoids the traditional way of orthodontic treatment because of its long duration which is responsible to increase incidence of root resorption, gingival inflammation, decalcifaction and increase incidence of caries. To overcome above problems and also preserve the periodontium, Wilcko et al. introduced Periodontally accelerated osteogenic orthodontics (PAOO). It is a procedure that combines corticotomy, grafting with bone graft and the application of orthodontic forces. [1] The disadvantage of these technique is unable to perform soft tissue coverage at a time. [2] To overcome above disadvantage, Dibart introduced piezoincision which is minimal invasive procedure when compares to PAOO. In this technique,the incisions are placed on buccal side. [3]

Fig 1a: Pre operative image shows gingival recession irt 31 Fig1b: Post opeartve image shows complete coverage irt 31 after 6 months

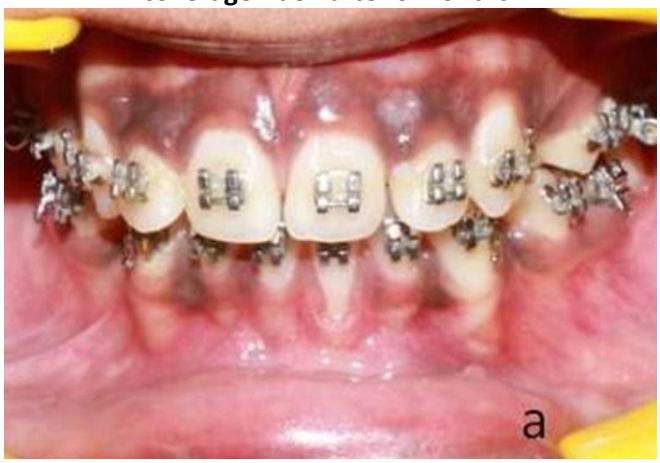


Fig 2a: Full thickness flap elevation
Fig 2b: Decortication Fig 2c: Particulate grafting was done with G-graft Fig 2d: Suturing with 4-0 black braided silk

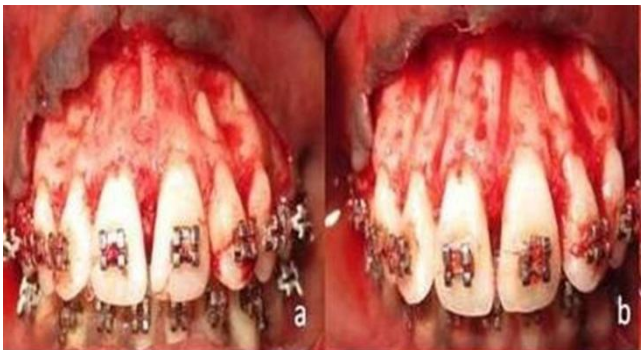
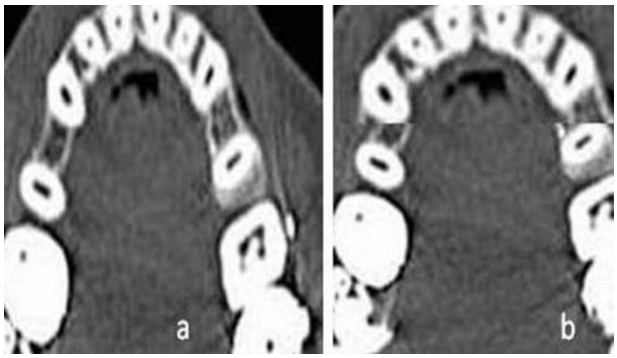


Fig 3a: A mid level incision at interdental area
Fig 3b: Piezo corticotomy with tunnel preparation
Fig 3c: Free graft was obtained from palate
Fig 3d: Graft was placed at tunnel and sutured with 4-0 chromic gut suture

Fig 4a: Preoperative CT, Fig 4b: Post operative CT after 6 months



Case report: A 22 year old female patient who was undergoing orthodontic treatment referred to the Department of periodontics, Kamineni institute of dental sciences, Narketpally for corticotomy procedure. Intra oral examination revealed that Angle's Class I molar relation, arch expansion was undergoing in both maxillary and mandibular arches and Miller's Class I recession in relation to 31 [Fig.1].After obtaining consent from the patient; conventional corticotomy was performed in the maxillary arch and piezo incision with soft tissue grafting was performed in the mandibular arch.

Maxillary corticotomy: Crevicular incisions were performed from the distal surface of extraction space on one side to the contralateral side after adequate anesthesia. A full thickness mucoperiosteal flap was then elevated extending 3-4 mm beyond the mucogingival junction [Fig.2a]. With the help of Piezotome, vertical corticotomy was prepared from the distal surface of canine on one side to the distal surface of canine on the other side. Isolated perforations were made over the radicular surface of the alveolar bone with the help of round carbide bur no.2 [Fig.2b]. Particulate grafting was done with G-graft (particle size 0.9mm-1.9mm) [Fig.2c]. Primary closures of flaps were achieved with non resorbable interrupted 4-0 black braided silk sutures. The sutures were left in place for 8 days. [Fig.2d].

It is not possible to perform conventional corticotomy and treatment of gingival recession in relation to 31 at the same time in the mandibular arch. As Free gingival graft takes blood supply from the recipient site (recession area). In conventional corticotomy, the full thickness mucoperiosteal flap was elevated, which hindered blood supply to free graft and led to the failure of free graft. This advantage was overcome by

in piezoincision technique in which full thickness mucoperiosteal flap was not elevated. So there was no compromise in blood supply to free graft.

Mandibular corticotomy: The mandible anterior region was anesthetized with mental nerve block. A periodontal probe and computed tomography (CT) were used to examine the soft and hard tissue before proceeding for vertical incisions. Vertical incisions were performed both buccally and interproximally in the attached gingiva [Fig.3a]. After completion of vertical incisions, the tip of the Piezotome (BS1) was inserted in the openings which were previously made and a 3 mm piezo electrical corticotomy was done .The first mark on the BS1 insert was used as the landmark for the decortication depth. After decortication, a periosteal elevator was inserted between the periosteum and the bone through one of the vertical openings, a blunt dissection was carried out which finally led to tunnel preparation for the holding of free graft which was obtained from palate. [Fig.3b].

Free gingival graft was obtained from the palate. The Greater palatine nerve block was given at palate (donor) [Fig.3c] and a shallow incision was made with the help of No.15 surgical blade. A blade was inserted at one edge of the graft and the tissue edge was hold with tissue forceps. The incision was continued in such a way to get desired thickness of the graft.

The graft was placed in the prepared tunnel irt 31 and suturing was done with 4-0 resorbable chromic gut suture. [Fig.3d] The remaining areas (where tunneling was not performed) did not require suture placement. Post operative management: Patient was advised to take antibiotics and anaglesics and to take soft diet, use 0.12% chlorhexidine mouthwash twice a day and warm saline rinses 5-6 times daily after 24 hours. Avoid brushing the affected site until sutures are removed.

Suture removal was done in the maxillary arch and mandibular arch at 1week and 2 weeks respectively. After 2 weeks active orthodontic movement was started.

Results: Predictable root coverage was obtained irt to 31 and it was stabilized after 6 months [Fig.1b]. Retraction space (Avg. 8 mm in the maxilla, Avg 7 mm in the mandible) was closed within 6 months. [Fig.4a & 4b]

Discussion: Patients often avoid orthodontic treatment because of its long duration. For shortening the treatment time and keep up sound periodontal structures, an alternative procedure was popularized, known as Periodontally Accelerated Osteogenic orthodontics. [1] It is a procedure that combines selective de cortication, placement of bone graft on decorticated surface and application of adequate orthodontic forces for tooth movement. [4]

It is based on Regional acceleratory phenomena (RAP) [5]. But it requires extensive full thickness flap elevation which leads to patient discomfort and high risk of complications leads to lower acceptance. [4, 5]

In the present case report, Conventional corticotomy was performed in the maxillary arch accordance to the technique which was proposed by Wilcko et al [1]. The retraction space closed in 6 month similar to a study conducted by Wilcko et al. [1]

Several reports regarding adverse effects on the periodontium after corticotomy, ranging from no problems to slight interdental bone loss and loss of attached gingiva, to periodontal defects observed in some cases with short interdental distance, but no such changes observed in the present case report. [6-9]

In the present case report, CT used to find out bone levels similar to a study which was done by Vercellotti and Podesta [10]. In the present case report, periodontal probe was used to stretch the incision for examination of dental and osseous topography similar to a study which was done by Dibart et al. [3]

In the present case report, incisions were placed on buccal side as patient was undergoing arch expansion. Similar principle was used by Vercellotti and Podesta in their study. [10]

In the above case report, soft tissue grafting was performed for the treatment of Miller's class I gingival recession and achieved full coverage. Similar result was obtained by Dibart et al. [3]

At the end of the 6 months, both techniques provided decrease in treatment time, with addition to that

piezoincision provided predictable root coverage with minimally invasive manner irt to 31.

The present case report was used CT and a periodontal probe for placing vertical incisions which was contrary to Jofre et al in which metal markers were used for the placement of vertical incisions. [11]

Conclusion: Piezo incision technique is novel technique in PAOO.It is minimal invasive, requires less clinical skills, easy to perform and the results are comparable with conventional PAOO. By this technique, we can perform both soft and hard tissue grafting at the same time.

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