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RECESSION COVERAGE BY USING 2 DIFFERENT MINIMAL INVASIVE TECHNIQUES- PIN HOLE VERSUS MCAT: A CASE REPORT

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Abstract
Gingival recession, the apical shift of the gingival margin, results in root surface exposure. Its aetiology is multifactorial, including teeth position within the dental arch, bony dehiscence, alveolar mucosa thickness, incorrect toothbrushing, orthodontic treatment, and periodontal disease. With the introduction of minimally invasive surgery, various techniques proposed for managing Gingival recession minimize patient morbidity and maximize surgical outcomes. The present case report includes two patients with primary complaint of sensitivity and poor aesthetics in the upper front teeth regions. In one patient, Pin Hole technique was planned, while in the other patient, Modified Coronally Advanced Tunnel (MCAT) was performed. Post-operative healing was uneventful, with significant recession reduction in both the cases and an increase in the width of the attached gingiva at both sites. Gingival recession, apart from posing as an aesthetic complication, also results in tooth sensitivity. This makes the management of Gingival recession very important for which multiple treatment modalities are available. The current case report highlights the success of the two minimally invasive techniques in managing isolated gingival recession.

INTRODUCTION:
One of the most common aesthetic concerns associated with the periodontal tissues is gingival recession. It is a problem affecting almost all the middle or older aged to some degree. It is basically the apical migration of gingival margin to the cemento-enamel junction (CEJ). Gingival recession can be caused by periodontal disease, accumulations, inflammation, improper flossing, aggressive tooth brushing, incorrect occlusal relationships and dominant roots. These can appear as localized or generalized gingival recession, also it can occur with or without loss of attached tissue. Gingival recession may affect in accentuated sensitivity because of the exposed dentin.[1]
Various perioplastic surgeries are advocated for the treatment of gingival recession including free gingival grafts (FGG), laterally repositioned flap (LRF) and coronally advanced flap (CAF) with their various modifications. Since the last decade the patient's aesthetic expectations and perception of the use of least traumatic surgeries have led to the development of minimally invasive techniques.[2]

Following the similar concept, a novel minimally invasive technique, pin hole surgical technique (PST) was introduced by Chao. In this technique a needle is used to make a hole in the alveolar mucosal tissues. Through this pin hole, specialized instrument (tunneling knives TKN1 and TKN2) are utilized to loosen the gingival tissues gently and slide the gingiva to cover the denuded root surface.[3] Hereby all the muscular and fibrous adhesions are released until the flap can freely move coronally without any tension. Since it only involves the adjustment of the position of the existing gingival tissues coronally, there are no incision, no grafts, no sutures. PST is a promising modality that reaches the periodontal ambition for gingival recession defects.[4]

Another surgical approach which has provided successful outcome in the treatment of multiple adjacent gingival recessions (MAGR) is modified coronally advanced tunnel (MCAT) consisting of a preparation without raising a mucosal or mucoperiosteal flap and keeping the papillae intact. MCAT with the absence of releasing incision delivers aesthetic outcome, favourable wound healing, minimally post-operative morbidity and optimal blood supply and graft nutrition.[5]

The tunnel approach is a split flap preparation of buccal tissues.[6] Intrasulcular incision extending to at least one adjacent tooth on both the sides keeping the interdental papillae intact of affected teeth with microsurgical blade (no. 15C blade) of affected teeth.[7] Positive outcomes of root coverage with tunnelling might be attributed to inherent advantage of this approach being a minimally invasive procedure with limited flap opening and lack of vertical releasing incisions, all of which contribute to decreased tissue trauma, enhanced wound healing, and good blood supply.[6]

Guided Tissue Regeneration is based on principle of epithelial exclusion or compartmentalization. It consists of placing a barrier membrane between the surgical flap and the root surface to prevent the gingival epithelial cells and connective tissue from interfering in the root surface during healing.[8]

CASE REPORT:

Two young male patients presented at the Department of periodontology and Implantology Subharti Dental College & Research Centre, Meerut, 2022 with a chief complaint of sensitivity due to recession in maxillary anterior teeth. Medical history revealed no significant findings. Both the patients were treated with a different minimally invasive approach and then compared to see the results.

SURGICAL PROCEDURE:

The treatment plan was explained and informed consent was obtained before treatment, oral prophylaxis was done. The surgical procedure was performed under aseptic surgical protocols.

CASE 1:

Under local anaesthesia, pin hole with a needle around 2–3 mm (fig. 3) was made in the base of the vestibule just apical to the recession site in case of a single recession defect (fig.1,2). In case of multiple recession sites, the horizontal incision was made in the base of the vestibule in the inter-radicular area of two adjacent defect sites. A sulcular incision was given keeping the tip of the interdental papilla intact at both mesial and distal sites. A tunnelling knife (TKN 1 and TKN2) was inserted through the pinhole (fig. 4). The flap was then extended coronally and horizontally to allow for elevation of two adjacent papillae on each side of denuded root(s). The interproximal extension of flap allowed the coronal advancement of the mucogingival complex beyond the cementoenamel junction at the defect site. It was then rinsed with irrigating saline and root surface was cleaned. Now the PerioCol®-GTR membrane was placed through the pinhole beneath the tunnel (fig. 5). For stabilization, one coronal composite stop for suture was placed on the crown of the teeth with light-cure composite (fig. 6). Amoxicillin 500 mg three times a day and a painkiller SOS was advised for three days postoperatively. Patient was refrained from brushing at the surgical site for 4 weeks and was advised 0.2% chlorhexidine mouthwash twice daily for 15 days. The stabilizing suture was removed on the 10th day of surgery (Fig.7).

CASE 2:
Under local anaesthesia, intrasulcular incisions were placed by using 15 C blade (fig. 10) at the recession sites (Fig 8,9) and mucoperiosteal flaps were raised. The tunnelling knives (TKN 1 and TKN 2) was inserted (fig. 11) and tunnel preparation was completed leaving the interdental papilla intact (fig 12). Mucoperiosteal tunnel preparation was extended by full- thickness elevation apically from the mucogingival junction. Remaining collagen bundles on the inner surface of the flap were carefully cut using Gracey curettes until passive coronal displacement of the flaps and papillae was obtained. The PerioCol®-GTR membrane was placed beneath the tunnel (fig. 13).
For stabilization, two coronal stops for sutures were placed in the interproximal region and the flaps were positioned coronally to the CEJ by means of suspended sutures placed above the contact point (fig. 14). Patient was recalled after 1 month for follow up (Fig. 15).

RESULT:
From the present case report it was concluded that both the minimally invasive techniques are promising modality that reaches the periodontal ambition for the gingival recession defects. Also, use of specialised instruments TKN1 & TKN2 has provided successful outcome in treatment of MAGR defects. The minimally invasive techniques have an added advantage of deceased tissue trauma, enhanced wound healing and good blood supply. Also, excellent clinical results have been achieved with the use of collagen membrane.

DISCUSSION:
A study conducted with 6 months follow up using a minimally invasive technique which have gained much importance because of low patient morbidity and compatible results. Also, it gives promising results in treatment of miller's class I and II recession defects. The rationale behind using this novel surgical technique is that it is minimally invasive approach, scalpel usage is restricted to pinholes with no damage to intrasulcular tissues, does not require any sutures, minimal postoperative complications such as bleeding, pain, and better healing due to minimal manipulation of soft tissue by Agarwal er al.[2]

Mostafa et al[4] reported that Pin Hole surgical technique is a promising modality that reaches the periodontist ambition for gingival recession defects. This technique by John Chao reverses Gingival Recession without using Donor grafts, flap elevation or sutures. It ensures the patients comfort and satisfaction.

Long-term outcomes following treatment of RT 1 multiple adjacent gingival recessions (MAGR) using the modified coronally advanced tunnel (MCAT) was evaluated by Molnar et al[5]. The result indicated statistically and clinically significant complete root coverage. The results indicated that using collagen matrix in conjunction with the MCAT could be successfully used as an alternative to connective tissue grafts, with the advantage of avoiding the discomfort and morbidity of connective tissue harvesting.

Gorski et al[6] stated that MCAT Treatment for GR typically results in aesthetic improvement, elimination of dentin hypersensitivity, and minimized risk of root caries. Available data from recent literature indicate that tunnel technique is a highly effective and predictable procedure in the treatment of multiple GR defects. The result indicate that the prescribed treatment approach may lead to predictable root coverage.
Yadav et al[7] stated that among various surgical approaches, modified coronally advanced tunnel (MCAT) technique offers the advantages of faster wound healing and revascularization at surgical site by obviating vertical incisions and not incising the papillary tissues by Zuhr et al. and numerous clinical studies have also demonstrated the predictable outcomes with this technique for multiple facial Miller's Class I, II and III GR defects.

Ashraf et al[9] stated that GTR could be favourably employed to regenerate lost periodontal tissues. GTR involves the use of barrier membranes that exclude gingival fibroblasts and epithelium from the healing site thus allowing the granulation tissue derived from the periodontal ligament to repopulate the space adjacent to the denuded root surface.

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FIGURES:

CASE 1:

Pre – operative View

Pre – operative Recession Length

Pin hole with a needle around 2–3 mm

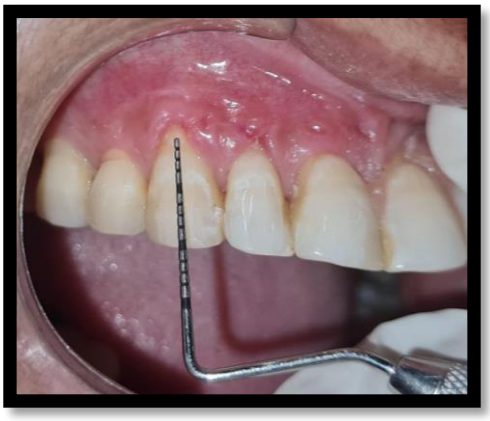
Tunneling with TKN1 & TKN2

PerioCol®-GTR membrane was placed

Coronal composite stop for suture beneath the tunnel.

1 month post operative view

CASE 2:



Pre- operative View

Pre- operative Recession Length

Intra crevicular Incision with #15c blade

Tunneling done with tunneling knives

TunnelpreparedPerioCol®-GTRmembraneplaced

beneath the tunnel.

Coronal composite stops for suture

1 month post operative view