A SPLIT MOUTH COMPARISON OF MINIMALLY INVASIVE V/S CONVENTIONAL TECHNIQUE FOR GINGIVAL REJUVENATION – A CASE REPORT

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ABSTRACT Several surgical techniques, including pedicle flaps and free soft-tissue grafts, have been indicated for the treatment of gingival recession with different success rates. Localized gingival recessions can be managed with various root coverage procedures, more specifically, using the coronally advanced flap with distinct designs. Nevertheless, recently, minimally invasive techniques have gained much importance because of lower patient morbidity and comparable results to conventional techniques. A recent innovation, the Pinhole surgical technique, was shown to offer definitive advantages in predictability, postoperative morbidity and patient satisfaction. This case report aims at comparing the modified triangular type of coronally advanced flap with PST to treat bilateral isolated Miller’s class I defect in both the maxillary canines by a split-mouth design.

KEYWORDS Coronally advanced flap, gingival recession, pinhole technique, root coverage

Introduction
In this era of esthetic driven dentistry, an array of surgical techniques such as pedicle and free soft-tissue grafting have been put forth to aid in gingival reconstruction. Numerous pioneering studies have affirmed the clinical usefulness of the Coronally Advanced Flap (CAF) and its many modifications to treat gingival recession (GR) in the presence of an adequate zone of existing keratinized tissue [7-10]. Currently, a CAF with subepithelial connective tissue graft (CTGs) is considered as a ‘gold standard’ procedure in the treatment of GR.[4] However, their related donor site complications include postoperative pain, bleeding and swelling. An in-depth analysis of the CTGs and other related techniques showed that all these methods require a coronal approach for entry incision, releasing incision, flap elevation or graft placement. In 2012, Chao introduced a novel vestibular surgical technique, the pinhole surgical technique (PST), which is minimally invasive and predictable.[5] This report presents a case of bilateral Miller’s class I recession defect in maxillary canines treated with modified triangular CAF 8 on one side and the PST on the other.

Case report
A 30-year-old female patient with no relevant medical history or deleterious oral habits reported to the Department of Periodontology with a chief complaint of sensitivity in the upper right and left front tooth region for the past 2 months. On clinical examination, Miller’s class I recession in both the maxillary canines was noted. A thorough case history was taken, and the periodontal parameters such as probing depth, recession depth, clinical attachment level, and height of keratinized gingiva were recorded [Figure 1-3]. Written informed consent for patient information and images to be published was provided by the patient, and routine blood investigation reports were obtained. Scaling and root planning was performed 2-weeks before the surgical procedure.
**Surgical procedure**

The aseptic surgical protocol was maintained throughout the surgical procedure. Before the surgery, extraoral disinfection with Povidone-Iodine solution and intraoral disinfection was performed using 0.2% chlorhexidine solution.

**CAF**

Root biomodification with tetracycline was accomplished. After obtaining adequate anaesthesia concerning the left maxillary canine, two oblique incisions were given, parallel to the mesial and distal incline of mesial and distal papillae, respectively, and were extended, surpassing the mucogingival junction (MGJ) followed by the sulcular incision. A full-thickness mucoperiosteal flap was then elevated up to the MGJ, followed by a split-thickness flap to liberate muscle tension and enable passive coronal displacement of the flap. De-epithelization of the interdental papilla was done sequentially. The flap was then coronally repositioned over the exposed root surface to achieve the desired root coverage and was sutured using 4-0 Mersilk suture (Ethicon). The periodontal dressing was placed [Figure 7-10], and the patient was advised to refrain from brushing at the site until sutures were removed. The patient was prescribed antibiotics and analgesics for five days and recalled after 1 week for suture removal. Adequate healing was noted.

**PST**

A week after suture removal, PST was performed in relation to the right maxillary canine. Following local anaesthesia, a horizontal incision of around 2–3 mm was made at the alveolar mucosa near the base of the vestibule, apical to the recession site. A tunnelling instrument (transmucosal periosteal elevator) was inserted through the pinhole and used for blunt dissection. The visualization of the instrument movements guided the flap elevation through the mucosa. The flap was then extended coronally and horizontally to allow for the elevation of two adjacent papillae on either side of denuded roots. This interproximal extension resulted in a freely movable flap which was coronally repositioned beyond the CEJ. To stabilize the advanced tissues, a collagen membrane was used. The membrane was cut into multiple longitudinal strips of 2 mm width each, presoaked in sterile water and introduced into the pinhole and tucked into the sub-gingival spaces under the papillae and marginal soft tissue until sufficient fullness was achieved to self-hold the mucogingival tissue complex in the new overcorrected position [Figure 4-6]. Next, Digital pressure was applied for 5 mins to stabilize the advanced flap, followed by periodontal dressing. Postoperative instructions included the use of 0.12% CHX mouthrinse and avoidance of brushing at the surgical site for 6 weeks, after which she was advised to use a roll brushing technique with an extra-soft toothbrush.

Patient satisfaction analysis was done based on visual analogue scale (VAS) rating at baseline (24 hrs after treatment), 2 weeks and 3 months. Patient comfort score (PCS) was taken on a scale of 0–10, 0 being no discomfort and 10 being unbearable discomfort. Patient esthetic score (PES) was recorded, with 0 being poor esthetics and 10 being excellent esthetics.

**Discussion**

After surgery, the clinical parameters were reevaluated at 3 months [Figure 11-14]. The effectiveness of a root coverage

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Figure 1: Preoperative clinical view of 13.

Figure 2: Preoperative clinical view of 23.

Figure 3: Measurement of clinical parameters preoperatively.
### Table 1

| PARAMETERS          | PINHOLE TECHNIQUE PREOP | PINHOLE POST OP | CORONALLY ADVANCED FLAP PREOP | CORONALLY ADVANCED FLAP POSTOP |
|---------------------|--------------------------|-----------------|--------------------------------|---------------------------------|
| RECESSION DEPTH     | 2mm                      | 0mm             | 3.5mm                          | 2mm                             |
| POCKET DEPTH        | 3mm                      | 2mm             | 2mm                            | 2mm                             |
| CAL                 | 5mm                      | 2mm             | 5.5mm                          | 4mm                             |
| KT TISSUE           | 6mm                      | 8mm             | 5mm                            | 7.5mm                           |

### Table 2

| Parameters          | PST   | CAF   |
|---------------------|-------|-------|
| % ROOT COVERAGE     | 100 % | 75%   |
| PD REDUCTION        | 50%   | 0%    |
| CAL GAIN            | 3mm   | 1.5mm |
| KT GAIN             | 2mm   | 2.5mm |

### Table 3

| TIME PERIOD | PST PCS | PST PES | CAF PCS | CAF PES |
|-------------|---------|---------|---------|---------|
| BASELINE    | 2       | 8       | 8       | 5       |
| 2 WEEKS     | 0       | 9       | 7       | 7       |
| 2 MONTHS    | 0       | 9       | 5       | 8       |
Figure 4: 2-3mm horizontal minimal incision in the alveolar mucosa apical to recipient site.

Figure 5: Full thickness flap elevation with transmucoperiosteal elevators, extending coronally and horizontally to allow elevation of 2 adjacent papillae on each side of denuded roots.

Figure 6: Tucking of collagen membrane strips into subgingival spaces to create tissue distension to hold the flap in place and left to heal by primary intention.

Figure 7: Oblique incisions.

Figure 8: Flap elevation.
Figure 9: Flap coronally advanced after de-epithelization of papillae and sutured.

Figure 10: Placement of periodontal dressing.

Figure 12: 2 week postoperative clinical view (CAF).

Figure 11: 2 week postoperative clinical view (PST).

Figure 13: 3 months postoperative clinical view (PST).

Figure 14: 3 months postoperative clinical view (CAF).
procedure is gauged by the percentage defect coverage, successful defect coverage criteria being 80% to 100%[4]. Using PST, the percentage defect coverage obtained was 100% at the end of 3 months, similar to the first study results of Chao, who obtained mean root coverage of 88.4% [5]. Using CAF, 75% defect coverage was achieved [Table 1, 2]. On comparison of the surgical time taken, we studied that CAF took 34 minutes while PST took only 16 minutes to complete, which is half of it. Concerning clinical parameters, recession depth was reduced, probing depth remained more or less the same, and a gain in the CAL and an increase in the height of keratinized gingiva on both sites was observed postoperatively. Patient-based outcomes such as PCS and most predominantly PES are very relevant considerations in root coverage procedures. This report shows better PC and PE scores with PST than CAF [Table 3], and a drastic reduction in sensitivity on both sites was noted. Although a mild degree of inflammation was observed at 1-week follow-up in both sites, the quick diminishment of symptoms in PST is coincidental with the swiftness in healing observed clinically and in postoperative photographs. Moreover, instant esthetic results can be obtained, which are obvious to patients contributing to the satisfaction levels. As far as we know, this is the first report to compare the CAF with modified triangular design8 and PST. The superiority of this novel surgical technique is attributed to its minimal invasiveness and no use of sutures. This technique also has an additional biological and esthetic benefit of not hampering vascular supply (no vertical releasing incisions involved), no scar formation, good colour match, lesser surgical time7, faster healing, and the existing papillae were not interfered with[3]. The limitations include the requirement of specialized instruments & technical expertise to avoid flap perforation.

Conclusion
While the efficacy of CAFs and CTGS to treat GR is well supported in the literature, this cannot be the only worthy treatment goal; we as clinicians must also use our skills to fulfil patients expectations concerning the esthetics, comfort & effectiveness. Hence within the limits of this case report, PST may be deemed as a promising alternative for obtaining optimal patient-based outcomes.

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Conflict of interest
There are no conflicts of interest to declare by any of the authors of this study.

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