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CASE STUDY

TREATMENT OF MULTIPLE ADJACENT GINGIVAL RECESSION DEFECTS WITH ZUCCHELLI TECHNIQUE – REPORT OF A SUCCESSFUL CASE WITH 9 MONTHS FOLLOW-UP

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ABSTRACT

Patients seeking treatment for gingival recession has constantly been on a raise, where patients' esthetic demands and biologic needs determine the treatment of choice for root coverage. Accordingly, the coronally advanced flap has been modified by Zucchelli and Sanctis to treat multiple gingival recession defects in esthetically critical areas. This technique does not use vertical incisions, which results in better healing, increases the quality of keratinized gingiva, provides good root coverage and doesn't involve a second surgical site. This article reports a case of multiple contiguous gingival recessions treated using Zucchelli technique, with a simplified yet detailed description of the technique utilizing a diagrammatic representation. Clinical parameters to assess gingival recession were evaluated from baseline till 9 months. Successful results were found in terms of good root coverage, aesthetic appearance and increased keratinized tissue quality that has persisted till 9 months follow-up. Zucchelli technique was effective in the treatment of multiple adjacent gingival recessions in patients with high esthetic demands.

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INTRODUCTION

Gingival recession is the apical displacement of gingival margin from the cemento-enamel junction (CEJ) that leads to exposure of root surface to the oral environment (Chambrone *et al*., 2010). It is one of the most common causes of tooth sensitivity, abrasion, root caries, and esthetic problems for which the patients might seek periodontal treatment (Chambrone *et al*., 2010; Cairo *et al*., 2008). Multiple adjacent recession defects can be treated by various surgical approaches like free gingival graft, coronally advanced flap, sub-epithelial connective tissue graft, pedicle grafts, pouch and tunnel technique, guided tissue regeneration and acellular dermal matrix (Oates *et al*., 2003). Several studies and recent systematic reviews have identified advantages and success for autogenous sub-epithelial connective tissue grafts (CTGs) regarding root coverage and increasing the width of keratinized tissue over most other techniques (Oates *et al*., 2003; Roccuzzo *et al*., 2002). Although considered the current gold standard, the CTG presents a number of disadvantages, including the need for harvesting at a distant donor site, limited tissue availability in cases of multiple adjacent recessions, and increased potential for post-harvest morbidity.

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When multiple gingival recessions of adjacent teeth are encountered, an approach to address the entire recession defect, at one single surgical time is the first choice for improving aesthetics and decreasing the surgical sites (Zucchelli and De Sanctis, 2000; Vergara and Caffesse, 2004). Zucchelli and Sanctis in the year 2000, proposed a modification in the coronally advanced flap technique to obtain desirable results of root coverage in such situations (Zucchelli and De Sanctis, 2000). Hence, in the present case we tried this technique, which has been claimed to have some advantages over conventional coronally displaced flap procedure and found it to be useful in treating multiple adjacent gingival recessions.

Case report

A 29-year old male patient with chief complaint of hypersensitivity was referred to the Department of Periodontics, DSCDS. The patient had no systemic problems and no adverse oral habits were present. He was following horizontal brushing technique using a hard brush. He had Miller's Class I recession in three adjacent teeth, with 4mm depth and 5mm clinical attachment loss (CAL) on the maxillary left first premolar, defects of 3mm depth and 4mm CAL was present on second premolar and first molar (Figure 1A). A decreased width and thickness of keratinized gingiva was also noticed. The affected teeth had no cervical caries, abrasions or restorations. After an informed consent, scaling,

root planing were performed and roll-on tooth brushing technique with a soft toothbrush was instructed to the patient. Zucchelli technique (Zucchelli and De Sanctis, 2000) was planned and executed successfully for root coverage.

Surgical technique

In this case, recession was present on maxillary left first premolar, second premolar, and on first molar. Following local anesthesia, a horizontal incision was made to form a modified form of envelope flap. The incision was extended to include one tooth on either side of the teeth to be treated in order to facilitate the coronal displacement of the flap. The planning of the incision was done, where an imaginary line was drawn dividing the buccal surface of maxillary second premolar into mesial and distal halves. This was considered as the midline of the treatment area (Figure 2). Then, the oblique incisions were given, which were directed differently, anterior and posterior to this imaginary line. The oblique incisions for the teeth present anterior to this imaginary line started from CEJs of the mesial line angles and ran anteriorly ending at the base of recession defects of the next teeth (Figure 3A). For the teeth present posterior to this imaginary line, oblique incisions started from the CEJs of the distal line angles and ran posteriorly ending at the base of recession defects of the next teeth (Figure 3B). Then, these oblique incisions from the base of the recession defects continued with intra sulcular incisions (Figure 4A & 4B). The envelope flap was raised with a full-split approach from coronal to apical direction. The full-thickness coronal portion would provide adequate thickness for better root coverage and the split-thickness apical portion would facilitate the coronal displacement. With the reflection of the flap new papillae got created, termed as surgical papillae, which would overlie anatomic papillae after suturing (Figure 5).

Curettes were used to plane the root surfaces. The residual portion of the anatomic interdental papillae (AP) wer de-epithelized from its tip to the level of CEJ to create connective tissue beds for suturing the coronally advanced surgical papillae (SP). A sharp dissection was done into the alveolar mucosa to eliminate muscle tension. The lip and muscle tensions were eliminated in the apical portion of the flap to enable adequate coronal displacement. While coronally advancing the flap, the surgical papilla got rotated towards the end of the flap i.e. the papilla located anterior to the imaginary line of the flap gets rotated in a mesial-coronal direction and the papilla located posterior to the imaginary line got rotated in a distal-coronal direction, finally getting positioned over the de-epithelized anatomic papillae. The flap was displaced coronally till the marginal portion of the flap passively reached a level coronal to the CEJ. The flap was seen to be stable in its final position without the sutures. The flap was properly sutured into position with sling sutures to obtain a precise adaptation of the buccal flap on the exposed root surfaces (Figure 6).

Post-operative appointments and Results

Patient was advised to take the prescribed antibiotics, NSAIDs and not to brush the surgical area for two weeks, but to rinse their mouth twice daily with chlorhexidine mouth wash. After fourteen days sutures were removed (Figure 7). Patient was advised to maintain the plaque control in the surgical area by chlorhexidine mouth wash for the next two weeks. After this period, the patients were instructed to brush the surgical area using a soft tooth brush with roll-on technique. Patient was recalled once every 3 months until the final examination. Nine months after surgery, there was about complete root coverage with a significant gain in CAL (4mm in maxillary left 1st premolar, 3mm for 2nd premolar and 1stmolar). Gingival tissue thickness and keratinized tissue width also had increased significantly. Tissue at the site appeared clinically healthy, with no signs of inflammation. A slight, but non-progressive recession on the mesio-buccal root of the 1st molar was seen during 3rd month follow-up (Figure 8), which was not present during 9th month follow-up (Figure 9) and might be attributed to the creeping attachment.

Figure 1. Pre-op picture with CEJ marked using a pencil

Figure 2. Imaginary line dividing the buccal surface of 2nd premolar into mesial and distal halves this was considered as midline of treatment area

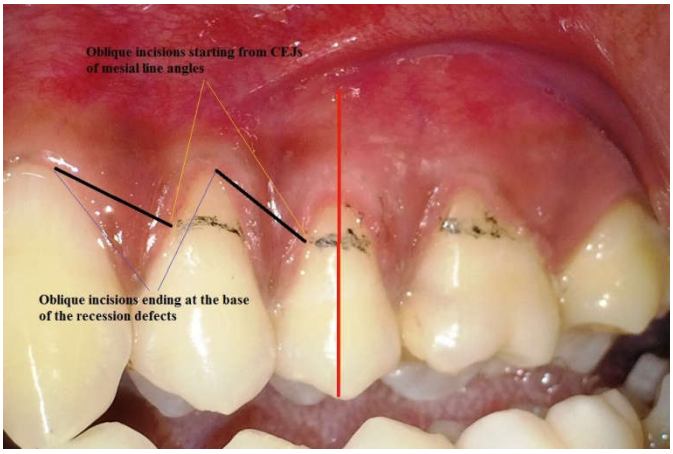

Figure 3A. Oblique incisions for the teeth present anterior to the imaginary line given from the CEJs of mesial line angles

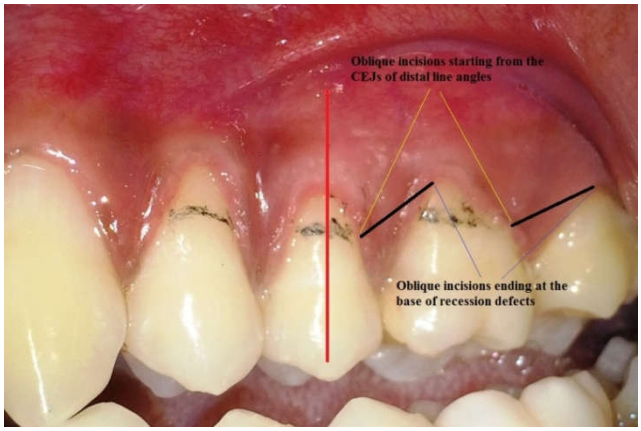

Figure 3B. Oblique incisions for the teeth present posterior to the imaginary line given from the CEJs of distal line angles

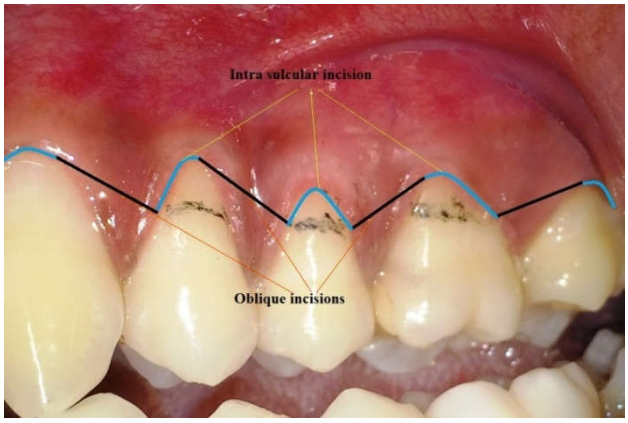

Figure 4A. Oblique incisions (black line) continuing with the intra sulcular (blue line) incisions

Figure 4B. Oblique incisions continuing with the intra sulcular incisions

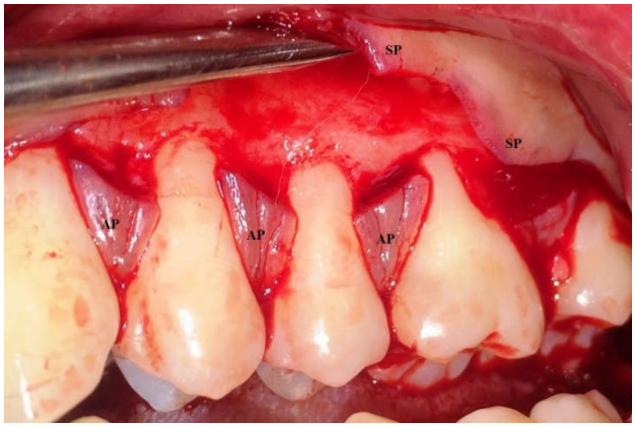

Figure 5. Picture showing anatomic papilla and surgical papilla after reflection

Figure 6. Picture showing coronally displaced flap by using sling suture

Figure 7. Post op after 2 weeks

Figure 8. Post op-3months

Figure 9. Post op-9 months

DISCUSSION

Treatment of gingival recession has become an important therapeutic issue in the modern day periodontal practice. Complete root coverage up to the CEJ is the goal to be achieved when the patient complains about esthetic appearance of teeth. Furthermore even if complete root coverage is surgically accomplished; the result may not be completely satisfactory in case of excessive thickness or poor blending of the area (Zucchelli and De Sanctis, 2000). This is seen most commonly with the use of free gingival or connective tissue graft. The other disadvantages with the use of free gingival or connective tissue graft are the involvement of a second surgical site and difficulty in harvesting sufficient graft for multiple adjacent gingival recessions. Thus, when gingival recessions occur in continuum, affecting multiple adjacent teeth, minimizing the number of surgical appointments to optimize esthetics by treating the defects in a single sitting with minimum surgical intervention becomes a priority. A coronally displaced flap is a reliable and predictable treatment modality in these situations (Cairo *et al*., 2008). But the disadvantage of this conventional method is the use of vertical incisions, which damage the blood supply to the flap and also result in unaesthetic scars in the alveolar mucosa (Cairo *et al*., 2008; Tanenbaum *et al*., 1980).

Hence, in the present case, Zucchelli's modification[5] of coronally displaced flap was used to treat multiple adjacent recession defects in a patient with high esthetic demands. This modified surgical approach provided certain clinical and biological advantages. Firstly, vertical releasing incisions were avoided helping to retain adequate blood supply to the flap and avoided unaesthetic scars after healing as also reported by Zucchelli *et al*. (2000) & Allen *et al*. (1989). Moreover, a full-split flap elevation was designed in such a way that, thicker portion of the flap resided over previously exposed root surfaces, providing better chances of root coverage. The thinner portion of flap extended beyond the muco-gingival junction facilitating coronal displacement of the flap, providing anchorage and blood supply to the surgical papilla in the inter-proximal areas between the root exposures. A normal inter-proximal incision during coronal displacement would cause a portion of interdental papilla to be displaced over CEJ on to the crown surface instead of being positioned over the middle of inter-proximal area, causing loss of interdental tissue. The modified design prevented this loss of tissue. Thus, the modified flap helped us achieve a successful root coverage in a seemingly difficult case of multiple, adjacent, wide gingival recessions. The result obtained was predictable as mentioned by Zucchelli at al. (2000) & Allen *et al*. (1989) and also showed a good color match similar to the case reported by Shakir *et al*. (2016). Though this Zucchelli's modification of coronally advanced flap has shown to produce reliable and predictable results as reported by various authors, it has not been used commonly due to the slight complexity involved in understanding the technique and its implementation. Hence, we have attempted to simplify the description of the technique with a diagrammatic representation in this report, which might facilitate more common utilization of this procedure.

Conclusion

The present case report showed that Zucchelli technique was effective in the treatment of multiple adjacent gingival recessions in a patient with high esthetic demands. Successful results were found in terms of root coverage, aesthetic appearance and increased keratinized tissue width.

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