



RESEARCH ARTICLE

A COMPARISON OF FREE ROTATED PAPILLARY AUTOGRAFT COMBINED WITH CORONALLY
ADVANCED FLAP AND CORONALLY ADVANCED FLAP ALONE IN TREATMENT OF
CLASS 1 & AMP; 2 GINGIVAL RECESSIONS". A MICROSURGICAL APPROACH

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ABSTRACT

Background: The purpose of the present study was to evaluate the clinical efficacy of free rotated papilla autograft technique combined with coronally advanced flap and coronally advanced flap alone on other side using the microsurgical techniques in root coverage procedures and to compare the efficacy of these two surgical therapeutic modalities in the treatment of localized gingival recession.

Method: 20 patients showing Miller's class I and class II type of localized gingival recession on the contralateral sides were selected and assigned randomly into experimental site A (free rotated papillary autograft combined with coronally advanced flap) and experimental site B (coronally advanced flap.) using microsurgical approach, according to the split-mouth design. The clinical parameters recorded were Plaque Index, Gingival Index, Recession depth, Recession width, Probing depth, Clinical attachment level, and Width of keratinized gingiva at baseline and 12 months post-operatively.

Results: All parameters improved from baseline to 12 months. The mean plaque index at baseline was 0.89 ± 0.11 which was reduced to 0.62 ± 0.11 at 12. The mean gingival index at baseline was 0.73 ± 0.12 which was reduced to 0.46 ± 0.12 at 12 months.

Conclusion: Both groups showed adequate amount of coverage of recession sites. However on comparison between the two groups, the mean difference in clinical parameters between the two procedures showed no statistical significance.

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INTRODUCTION

The main goal of periodontal therapy is to improve periodontal health and thereby to maintain a patient's functional dentition throughout his/her life. The term 'Periodontal Plastic Surgery', first suggested by Miller in 1988, was defined as the surgical procedures performed to prevent or correct anatomical, developmental, traumatic or plaque-disease induced defects of the gingiva, alveolar mucosa or bone (the American Academy

of Periodontology, 1996) (Roccuzzo et al., 2002). Gingival recession can be defined as a shift of the gingival margin to a position apical to the CEJ with the exposure of root surface (Zucchelli et al., 2003). Besides plaque induced periodontal inflammation, toothbrushing trauma is considered a major cause of this condition (Francetti et al., 2005). Tooth malposition, alveolar bone dehiscence, high frenum attachment and iatrogenic factors related to restorative and periodontal procedures, as well as orthodontic tooth movement have also been associated with the development of soft tissue recession (Francetti et al., 2004). Different treatment modalities to obtain root coverage in areas of soft tissue recession have been

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described. Among the soft tissue grafts, the sub epithelial connective tissue graft combined with or without a coronally advanced flap, is the most widely used and predictable technique in the esthetic treatment of soft tissue recession. In spite of several advantages, the main disadvantage of these procedures is the requirement of a donor site for procuring the connective tissue. Therefore, to overcome the disadvantage of these procedures Carlo Tiniti and Parma-Benfenati in 1996 (Tiniti and Parma-Benfenati, 1996) proposed a new technique. According to the authors, this procedure has the added advantage of:

- A single surgical site thereby avoiding patient discomfort in the palatal region
- Good color harmony with adjacent tissues
- Healing by primary intention.

The purpose of the present study was to evaluate the clinical efficacy of free rotated papilla autograft technique combined with coronally advanced flap and coronally advanced flap alone on other side using the microsurgical approach for root coverage procedures and to compare the efficacy of these two surgical therapeutic modalities in the treatment of localized gingival recession.

MATERIALS AND METHODS

This is a randomized controlled clinical study with 12 months follow up. The study population consisted of 20 patients with bilateral Class I and II recessions who were selected from outpatient section of department of periodontics, St Joseph dental college

Inclusion criteria

- Good systemic health
- Absence of periodontal diseases
- No medication intake affecting the periodontal tissues
- Non-smokers
- Having at least two sites of Miller's class I or class II gingival recession in different quadrants either labially/buccally, Thick and wide interproximal papilla not smaller than the recession defect.

Study design

A total of 40 sites from 20 patients were selected for the study, after completion of the presurgical phase of treatment. The selected sites were randomly divided into:

Experimental Site - A: 20 sites were treated with the free rotated papilla auto graft technique combined with coronally advanced flap by microsurgery method.

Experimental Site - B: 20 sites were treated with the coronally advanced flap by microsurgical method.

Following initial examination and treatment planning, the selected patients underwent phase I therapy. Two weeks after phase I therapy, only those patients maintaining optimum oral hygiene, were subjected to the surgical procedure. The clinical measurements were made with a William's graduated periodontal Probe. Plaque index (Silness and Loe, 1964), Gingival index (Loe and Silness, 1963), recession depth,

recession width, probing depth, clinical attachment level, papilla height, papilla width and width of keratinized gingiva, were recorded at baseline, 12 months post-operatively. Patients were treated using minimally invasive surgical technique with the aid of a surgical loupe having a magnification of 4.5x.

Experimental site A: A sharp incision was performed at a 90 degree angle to the vestibule, following the mucogingival line, vertical releasing incisions were used at the line angles of the adjacent teeth to facilitate positioning the flap slightly coronally (Fig. 1a). The muscle fibers were dissected beyond the mucogingival junction for approximately 10 to 12 mm in order to reflect a partial thickness flap on the facial aspect only. The epithelium from the facial aspect of the donor papillae was debrided with a surgical blade and the exposed root surface was root planed with curettes to remove bacterial contamination. At this point, the buccal papillary tissue of the de-epithelialized papilla is excised and rotated 180 degrees to place its base at the CEJ, matching with the exposed root surface. (Fig. 1b) Then, it is stabilized by suture (prolene non absorbable mono filament 5/0) and previously raised partial thickness flap is now coronally positioned, taking care to avoid any tension of the gingival tissue. (Fig. 1c) Interrupted sling suture and interrupted through-and-through sutures for the vertical releasing incisions are used to obtain stable and complete coverage of the grafted tissue.

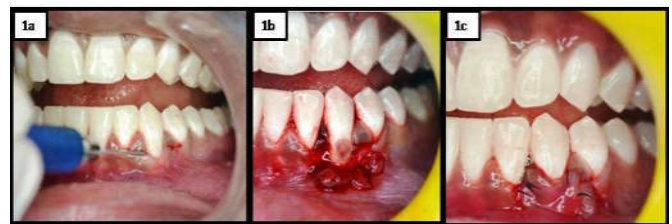


Fig. 1a,b, c. Surgical technique followed for experimental site A

Experimental site B: Two horizontal bevelled incisions (3mm in length), mesial and distal to the recession defect located at a distance from the tip of the anatomical papillae equal to the depth of the recession plus 1 mm. Two bevelled oblique, slightly divergent, incisions starting at the end of the two horizontal incisions and extending to the alveolar mucosa. (Fig. 2a) The resulting trapezoidal-shaped flap was elevated with a split-full-split approach in the coronal-apical direction: In order to permit the coronal advancement of the flap, all muscle insertions present in the thickness of the flap were eliminated. (Fig. 2b) The previously raised partial thickness flap is now coronally positioned, taking care to avoid any tension of the gingival tissue. Interrupted sling suture and interrupted through-and-through sutures for the vertical releasing incisions are used to obtain stable and complete coverage of the grafted tissue. (Fig 2c, 2d, 2e)

At both the sites, the surgical area was protected and covered with non eugenol dressing (Coe-Paktm, G C America Inc, USA).

Post surgical follow up

All patients were prescribed systemic Amoxicillin 500 mg thrice daily for 5 days and a combination of Ibuprofen 400mg and Paracetamol 325mg (Combiflam) thrice daily for 3 days. They were also instructed to rinse with 10 ml of Chlorhexidine gluconate (0.2%) mouthwash twice daily for two weeks.

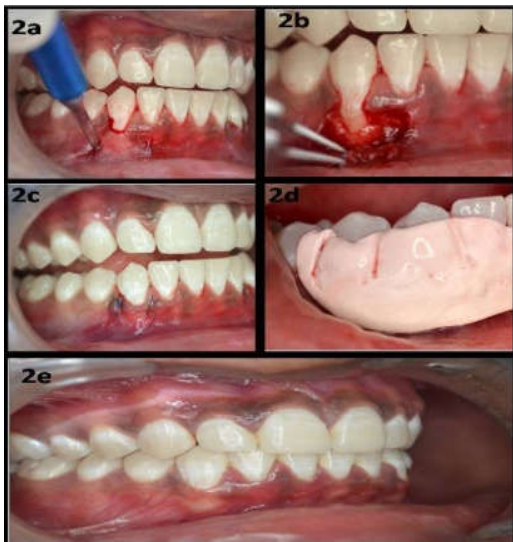
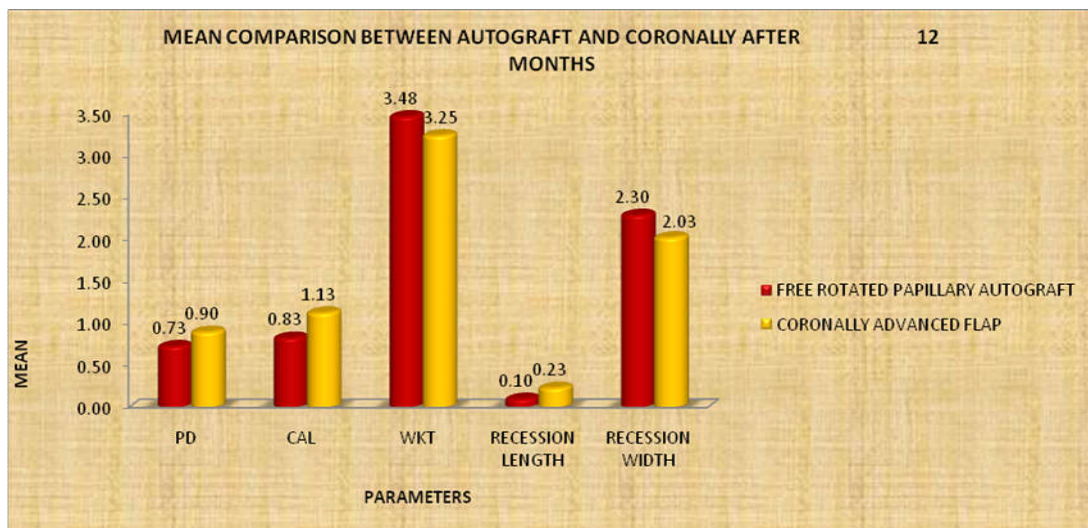


Fig 2a, b, c, d, e. Surgical technique followed for experimental site B

RESULTS

The difference between the pre operative and 12 months post operative measurements within each site were examined by paired t test and comparison between two sites were made by independent sample t test. Comparison of the mean reduction in recession depth, recession width, probing depth, CAL and WKT between the two groups at 12 months revealed a difference of 0.13 mm, 0.27mm, 0.17mm, 0.30mm and 0.23mm respectively which was statistically not significant ($P>0.05$).

1996 for the coverage of multiple shallow gingival recessions, and a coronally advanced flap. The main aim of this approach was to minimize the postsurgical course and patient discomfort in single-recession treatment with the main advantage being the involvement of a single surgical site unlike in the connective tissue grafting. The surgical technique per se in any mucogingival surgical intervention has a major role in its successful outcome. The use of magnification devices along with microsurgical instruments facilitates the use of minimally invasive surgical technique that reduces tissue trauma. Studies by Tibbetts and Shanelec *et al.*, 1994 Belcher *et al.*, 2001 have addressed the advantages of using magnification in periodontal surgery. The effectiveness of the microsurgical approach for periodontal regeneration and root coverage has been reported by Cortellini *et al.*, 2010 Francetti *et al.*, 2004 etc. Magnification, illumination and increased precision in tissue manipulations result in minimal tissue damage during surgery with faster revascularization of the grafted tissue thus, minimizing the morbidity of the surgical procedure when compared with conventional surgical techniques. At both the sites, difference in mean recession depth was 0.10mm and 3.12mm respectively, which was statistically significant ($P<0.05$). The results were in accordance with the findings Francetti *et al.* (2004), Fabbro *et al.* (2005), at site A and de Sanctis *et al.* (2007) at site B. The reduction in mean recession width was in accordance with the studies done by Tella Asha latha *et al.* (2009), Burkhardt *et al.* (2005) at site A and Lie hui huang *et al.* (2005) at site B. There was a mean reduction of probing depth at site A &B, at 12 months showing a mean difference of 0.73mm & 0.80mm respectively which was statistically significant ($P<0.05$). This coincides with the finding of a study done by Weinstein *et al.* (2004), but contradicts the findings by other studies done by Calace *et al.* (2005), Carlo tinti *et al.* (1996) at experimental site A.



Graph 1. Comparison between pre-op and post op parameters

The mean PI at baseline was 0.89 ± 0.11 mm which was reduced to 0.62 ± 0.11 mm at 12 months and showing a mean difference of 0.27 mm, which were statistically significant ($P<0.05$) (Graph 1).

DISCUSSION

A newer technique introduced by Francetti and co-workers 2004 describes the combined uses of the free rotated papilla autograft, originally described by Tinti and Parma- Benfenati

At site B the findings were similar to the finding of Carlo baldi *et al.* (2005) but not in agreement with another study done by patricia Andrade *et al.* (2010), Del pizzo *et al.* (2005). The mean width of keratinized gingiva showed a mean difference 3.48, which was in agreement with the studies done by Stefano parma Benfenati *et al.* (1996). The mean plaque index was reduced by 0.27mm and similar to the findings made by Niklaus Lang *et al.* (2005). The reduction in mean gingival index was statistically significant and coincided with findings. De sanctis *et al.* (2007), Barry Webb Jones Jr. *et al.* (1985).

Conclusion

With the purview of this study it may be concluded that both groups showed adequate amount of coverage of recession sites. However on comparison between the two groups, there was a slight but not statistically significant coverage of recession for free rotated papillary auto graft.

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