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Case Report

MODIFIED ROLL FLAP APPROACH FOR SOFT TISSUE AUGMENTATION: A CASE REPORT

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A R T I C L E I N F O

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A B S T R A C T

The modified roll flap technique takes inspiration from the conventional roll flap approach first described by Abram (1980)1 and provides a predictable source of pediculate grafts in deficient areas to enhance soft tissue thickness as well as aesthetics in the canine, premolar and molar area. Loss of buccal cortical plate after tooth extraction can lead to formation of mild to moderate Seibert class I ridge defect which can be corrected by soft tissue augmentation procedures. In the current case report, modified roll flap technique for soft tissue augmentation resulted in uneventful healing, minimal post-operative discomfort, and good aesthetic outcome. It also avoided the need for another donor site reducing the invasiveness and morbidity for the patient.

INTRODUCTION

Bone loss after loss of tooth is more extensive in the first year with reduction in alveolar ridge volume reaching upto 60% after 2 years.2 Collapse of the cortical plate can lead to deficiency of the alveolar ridge. This can be attributed to various causes such as traumatic tooth extraction, external trauma, developmental defects, abscess formation, tumour, presence of periapical or periodontal pathosis in a tooth which is to be extracted. Such defects impair prosthetic rehabilitation by providing poor emergence profile of the pontic not only affecting the placement and aesthetics but also causing phonetic and oral hygiene complications. Various techniques have been described in the past for soft tissue augmentation such as free gingival graft, connective tissue grafts, pouch and graft, roll technique, and modified roll grafts.

Free gingival grafts increase donor site morbidity, increase haemorrhage, post-operative pain and impaired function. Roll flap described by Abram has a disadvantage of exposed palatal bone post-surgically. Advantages of modified roll flap approach over Abram's roll flap technique include maximum amount of connective tissue that can be rolled on the buccal aspect, minimizes the amount of exposed bone by preserving the epithelium over it and thus minimises the post-operative discomfort in patients. The choice Siebert in the year 1983 classified the ridge deformities into three categories:3

- Class I :Bucco-lingual loss of tissue
- Class II :Apico-coronal loss of tissue and
- Class III: is a combination of Bucco-lingual with Apico-coronal loss of tissue.

This technique uses the 'trap-door' method to obtain connective tissue for augmentation and increases vascular supply to the graft site, better color compatibility with the adjacent tissue, and single surgical exposure avoiding second donor site. The purpose of this case report was to clinically evaluate the effectiveness of modified roll flap as a pedicle graft to augment localized alveolar ridge defect for prosthetic rehabilitation and get a better emergence profile for the pontic.

CASE REPORT

A 29 year old female patient was referred to the Department of Periodontology and Implantology, Government Dental College and Hospital, Mumbai, India from the Department of Prosthodontics with a complaint of Class I Siebert deficiency of alveolar ridge in the edentulous maxillary molar region. (Figure 1) Prior to the prosthetic rehabilitation of the edentulous area with a fixed prosthesis, a decision was taken to augment the area to create an aesthetic emergence profile for the pontic. Modified roll flap technique was chosen for the tissue augmentation in the maxillary posterior edentulous region.

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Figure 1 Pre-operative photograph

MATERIALS AND METHODS

Written informed consent was obtained from the patient before proceeding with the surgical procedure. Patient was then asked to rinse his mouth with 0.2% chlorhexidine mouthwash and extra oral scrubbing was done with 10% betadine solution. 2% lignocaine hydrochloride with 1:80,000 epinephrine was administered as local anesthesia in buccal as well as palatal tissues. First shallow incision in given with a 15 number surgical blade along the alveolar crest and slightly palatal in a mesio-distal direction. Two full thickness vertical releasing incisions are given starting from the incision line on the crest towards the palate (Figure 2).

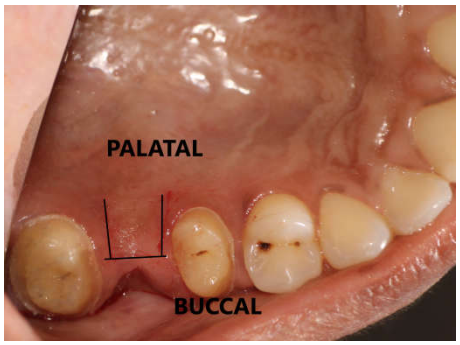

Figure 2 Design of incision

These two vertical incisions should roughly be parallel to each other and 2 mm away from the sulcus of the adjacent teeth in order to preserve the interdental papillary region. The length of the vertical incisions depends on the amount of connective tissue needed for augmentation. A flap consisting of epithelium is reflected on the palatal side till the end of the vertical incisions to expose the underlying donor connective tissue. (Figure 3). The connective tissue underlying the palatally reflected epithelial flap is then separated from the adjacent tissue by giving two vertical incisions at both the ends and one incision at the apical end of the connective tissue. A periosteal elevator can be used to separate the connective tissue graft from the underlying bone and reflected till the crest of the alveolar ridge (Figure 4).

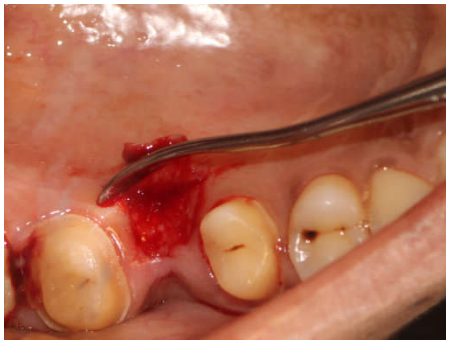

Figure 3 A pedicle of epithelium reflected palatally

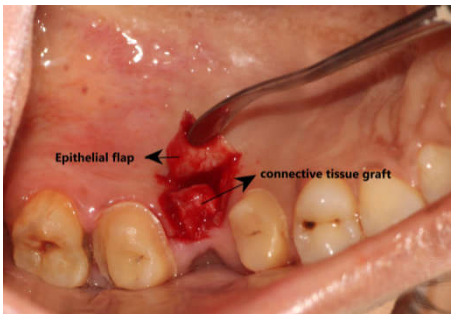

Figure 4 Connective tissue graft separated from underlying bone

Figure 5 Buccal pouch created

A pouch is created between the buccal mucosa and the alveolar bone using a 15 no. surgical blade or a Kirkland knife (Figure 5). The connective tissue pedicle graft is then rolled into the buccal pouch and secured in position with 4-0 resorbable sutures. The epithelial graft on the palatal side is secure with sutures to ensure primary intention healing. (Figure 6) This was followed by giving a periodontal dressing. Post operative instructions to maintain oral hygiene were given and advised 0.12% chlorhexidine mouthwash rinsing twice daily for 14 days. Antibiotics and analgesics were also prescribed. Patient was advised to avoid brushing or any kind of trauma to the surgical site till complete healing occurred and tissue is no longer tender to touch.

Figure 6 Sutures placed to secure connective tissue graft and epithelial flap.

Figure 7 1 month follow-up

Figure 8 2 months follow-up

RESULTS

On follow up examination after 1 month and 2nd month, healing was uneventful with a significant increase in soft tissue on the buccal aspect of maxillary molar region (Figure 7 and 8). There was no post-operative discomfort reported by the patient and sufficient soft tissue augmentation along with increase in keratinised gingiva was found at the surgical site. Colour matching with the adjacent gingiva was satisfactory.

DISCUSSION

Alveolar deficiency and its correction has always been a challenge in therapy to periodontists due to high demand of aesthetics by the patients. Initially it was generally believed impossible to surgically reconstruct deformities in the partially edentulous ridge and such voluminous deformities were filled with prosthetic materials in an effort to restore the contours of the jaws. The decision to select either guided bone regeneration or soft tissue augmentation as a treatment depends on the type of the defect and type of prosthetic rehabilitation. Since aesthetic outcome and emergence profile is a major concern for pontic fabrication, it can mostly be achieved by soft tissue correction. Small to moderate Class I ridge defects, primarily in cases with a single tooth space can be corrected using Abrams roll technique.1 Since it had few drawbacks like, exposure of the bone palatally and healing by secondary intention, post operative discomfort, increased chances of bleeding and swelling, Scharf and Tarnow modified the Abrams's technique to acquire the pedicle of connective tissue by using trap door approach.4 It had several advantages like reduced post-operative complications, good blood supply to palatal tissues and faster healing by primary intention. Park and Wang (2012) used pouch roll technique for soft tissue augmentation around dental implants and achieved similar results.5

In a study on 12 patients by Barakat (2013), modified roll flap technique effectively augmented the thickness of the labial peri-implant soft tissues to achieve better appearance in the esthetic zone. Kulkarni *et al* (2017) used a similar technique to augment soft tissues around dental implants and obtained favourable results. The above technique improves the aesthetics and maintains hygiene by avoiding food impaction under the pontic. It also reduces risk of infection, chair time and is cost-effective. The results remained stable in the follow-ups and patient was satisfied with the final outcome.

CONCLUSION

Based on various studies conducted in the past and the current case report, it can be concluded that modified palatal roll technique as a treatment for mild to moderate ridge deficiencies is a predictable source for increasing soft tissue thickness and keratinized mucosa. The results of the same seem to be stable over a long period of time giving favourable functional as well as aesthetic outcomes. Clinical studies with large sample size and longer follow-ups are necessary to determine the long term stability and success of this technique.

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