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Combined Use of Buccal Fat Pad and Collagen Membrane in Reconstruction of Surgical Defects of Buccal Muscosa: A Case Series

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1. Abstract

Leukoplakia, verrucous hyperplasia, epithelial hyperplasia, erythroleukoplakia, mild to severe epithelial dysplasia, lichen planus, and squamous papillomas are examples of epithelial lesions of the oral cavity. The results of chemotherapy for these lesions have been inconsistent across the literature. Therefore, the best outcomes are obtained by surgically excising the defect and then reconstructing it. Local advancement flaps, pedicled flaps, regional flaps, free tissue transfer, split thickness grafts, and artificial membranes are all options for intraoral soft tissue resurfacing. In the literature, the outcomes of each reconstructive option have differed.

In this case series, we mainly highlight the Buccal Fat Pedicled (BFP) flap's adaptability. The simultaneous application of the buccal fat pad and collagen was implemented across all cases in our study. This approach served as an additional safeguard against potential collagen loss during the postoperative period. All five cases remained free of recurrence and exhibited healthy, pliable buccal mucosa after a six-month period. There was minimal to no indication of fibrosis at the surgical site, and no alterations in mouth opening were observed. During each follow-up appointment, advice regarding tobacco cessation was reiterated.

2. Keywords: Buccal fat pad; Collagen membrane; Reconstruction; Buccal mucosa; Epithelialization; Granulation

3. Introduction

Epithelial lesions of the oral cavity include Leukoplakia, Verrucous hyperplasia, Epithelial hyperplasia, Erythroleukoplakia, Mild to Severe Epithelial Dysplasia, Lichen planus and Squamous papillomas. Chemoprevention of such lesions has shown varied outcomes in literature. Hence surgical excision followed by reconstruction of the defect gives optimal results. This case series is focused on patients with intra-oral epithelial lesions coming to the Department of Oral and Maxillofacial Surgery, KGMU, Lucknow which are managed by surgical excision of lesions with adequate margins. The defect is then reconstructed with a pedicled buccal fat pad which is further covered with collagen membrane.

An essential step for proper wound healing is the placement of tissues, which fills the defect, otherwise there, occurs healing by secondary intention which leads to scarring and fibrosis. Intra-oral soft tissue resurfacing can be done with local advancement flaps, pedicled flaps, regional flaps, free tissue transfer, split thickness

grafts and artificial membranes. Each reconstructive option has given varied results in literature. Our focus is primarily on the versatility of the Buccal Fat Pedicled (BFP) flap in this case series.

4. Case Report I

A 45-year-old male patient reported to our centre with a leukoplakic patch in the left maxillary buccal vestibular region. The lesion was 2.5 × 2.0 cm and had classic cracked mud appearance (Figure 1a) Lesion was excised with 5mm margins under local anaesthesia (Figure 1b).Lesion was non tender, non-indurated and non-scrapable.

Buccal fat was pedicled to the defect site and sutured followed by placement of collagen membrane (Figure 1c and 1d).

Post operatively the patient was placed on nasogastric feed for 15days and nil per oral advice was given to facilitate quicker healing.A pompom dressing was placed for 1 week over the site.Healing was satisfactory with good epithelisation after 23 month(Figure 1e).

Figure 1A and B:(A) Leukoplakic lesion. (B) Surgical excision of the lesion.

Figure 1C and D: (C) BFP to fill defect. (D)Collagen membrane over BFP.

Figure 1E: Healing of the lesion after 23 months.

5. Case Report II

A 35-year-old male patient reported to our centre with an ulcero proliferative growth in the right buccal mucosa. The lesion was 1.5 × 2.0 cm having a plaque like appearance (Figure 2a). As there was a strong suspicion for squamous cell carcinoma incisional biopsy was done and report came out to be Mild Epithelial Dysplasia. Lesion was excised with 5mm margins under local anesthesia (Figure 2b).

This was followed by harvest of Buccal fat pad pedicled flap to fill the defect and covering the former with collagen membrane (Figure 2c and 2d). Post-operative care was similar to Case report 1. Healing after 7 days, 15days and after 1 year was observed (Figure 2e, 2f and 2g).

Figure 2A and B: (A) Mild Epithelial Dysplasia. (B).Excision of the lesion.

Figure 2E, F and G:(E)1 week follow up. (F)15 days follow up. (G). 13 month follow up.

6. Case Report III

A 37-Year-old presented to our department with the chief complaint of recurring white patch in his left buccal mucosa for the past one year.Clinically lesion was 4cm anteroposterior length and 3.5cm in supero-inferior extension. There was no pain, no induration and classic cracked mud appearance was noted (Figure 3a). Lesion was excised with adequate margins (Figure3b) and similar steps were followed (Figure 3c and Figure 3d) as the above two cases.

Patient was followed up after 1year showing good epithelisation of the buccal mucosa (Figure 3e).

Figure 3A, B, C and D:(A)Leukoplakia of Left buccal mucosa. (B)Excision of the lesion. (C)BFP placed in defect. (D)BFP covered with collagen membrane.

Figure 3e: Post operative photograph after 15 months.

7. Case Report IV

Patient aged 56-year-old female reported to the department with the chief complaint of cauliflower like growth in lower left jaw. On clinical examination there was verrucous like growth of lower left edentulous jaw for 5 months. Biopsy reports came to be Verrucous Hyperplasia with Mild dysplasia. Patient was planned for surgical excision (Figure 4a, 4b, 4c, 4d) of the lesion with 5mm margins and the same protocol was followed as the above case reports.

8. Case Report V

Patient aged 27-year-old male reported to the department with the complaint of growth in lower left jaw. On clinical examination there was like growth of right buccal mucosa for 8 months. Biopsy reports came to be Erythroleukoplakia. Patient was planned for surgical excision of the lesion with 5mm margins and the same protocol was followed as the above case reports (Figure 5a, 5b, 5c).

Figure 4A, B, C and D: (A)Lesion. (B)Excision of the lesion. (C)Collagen + BFP. (D)Healing after 14 months.

9. Discussion

Since 1977, a buccal fat pad has been used as a reconstructive option in maxillary defect[1]. Since then, it has become a versatile reconstructive option. It appears from 3 months in utero and grows upto 9.6 ml in volume at birth2. It provides with a graft of 6 ×5 × 3 cm graft and can be used to cover defects of 10cm[2-4]. Intra-oral defects of buccal mucosa after tumor excision rarely exceed this, and thus, buccal fat pad was near to ideal choice as a reconstructive option in our series. As our series involved lesions in the buccal mucosa, after excision of the lesion, reconstruction was done very rapidly because the buccal pad of fat lies in close vicinity to the surgical site. This was an added advantage in our series. Less time was spent in harvesting the flap which reduced the overall intra-operative time. The harvested graft was held in place with 3-0 absorbable vicryl. Additionally, we have planned to cover the exposed buccal fat pad with bovine collagen membrane and holding it in place with 3-0 vicryl sutures. According to Singh et al[5] using collagen over buccal fat pad has reduced chances of damage to buccal fat pad by food lodgment and tongue actions. It also reduces infection of buccal fat pad and post-operative pain[7] by acting as a biological dressing over the graft. However, placement of collagen is challenging, technique sensitive and often increased the intra-operative duration in our series. Literature has shown use of only bovine collagen for leucoplakias. Movaniya et al [8] have observed that loss of collagen occurs if not properly anchored with sutures. Thus, combined use of buccal fat pad and collagen was used in all our series. It provided an added security measure in case collagen loss occurred during the post-operative

time. All cases were followed up for a duration more than 6 months and the quality of epithelization, scarring and fibrosis of the surgical site was observed. All 5 cases were recurrence-free and showed healthy pliable buccal mucosa after 6 months. There was little to no evidence of fibrosis at the surgical site and no changes in mouth opening. At each follow up tobacco cessation advice was reinforced and all patients have been kept on bi-annual follow ups to observe for recurrence.

10. Conclusion

In our series surgical defects created healed by epithelialization and granulation. Intra-oral wounds that are left uncovered are prone to fibrosis, pain, infection. Hence the reconstructive option used in our series was combined use of buccal fat pad and collagen. Future large scale multi-centric, randomised controlled studies should be carried out to observe statistically significant results for this combined approach to pre-malignant lesions management.

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