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Case Report

A novel technique for reconstruction of onco-surgical partial glossectomy defects with platelet rich fibrin: a case report

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Introduction

Platelet-rich fibrin (PRF) is a modification over traditional autologous platelet-rich plasma, and it has reported properties of augmented tissue healing and immunity [1,2]. During PRF processing platelets are activated and their massive degranulation implies a very significant growth factor release [3]. PRF is used in many surgical interventions in the oral and maxillofacial (OMF) region including bone augmentation, socket preservation, sinus lifts and periodontics for correction of intra bony defects, gingival recession, periapical lesions, guided bone regeneration, pulpotomies, and periapical surgeries with successful outcomes [1,4]. Use of PRF for human tongue onco-surgical reconstruction is not yet reported in medical literature. Herein, we describe a successful application of PRF for post onco-surgical partial glossectomy defect reconstruction.

Case Report

A 28-year-old housewife was seen at the OMF clinic with a gradually expanding ulcerative exophytic growth on her left tongue, measuring 6 cm x 4 cm, characterized by everted and indurated ulcerative margins. The lesion started as a pinpoint ulcer and progressed significantly over three months without causing pain, but it led to reduced tongue mobility, severely affecting her speech and swallowing. She was otherwise healthy and not on any medication. She had neither betel quid chewing nor any other causative associated habits related to oral cancer. Multiple incisional biopsies from the lesion confirmed the diagnosis of squamous cell carcinoma. In addition, a 2 cm single ipsilateral

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submandibular lymph node was identified, but there was no clinical evidence of distant metastasis, suggesting clinical classification of T4aN1M0.

Wide local surgical resection of the primary tumor was performed with reconstruction using an ipsilateral pedicled naso-labial flap. The flap was meticulously harvested while preserving the underlying facial vascular pedicle and was delivered to the glossectomy site making a surgical tunnel through the mylohyoid muscle. An ipsilateral extended supra-omohyoid selective neck dissection was also performed to manage loco-regional metastasis of the disease (Figure 1).

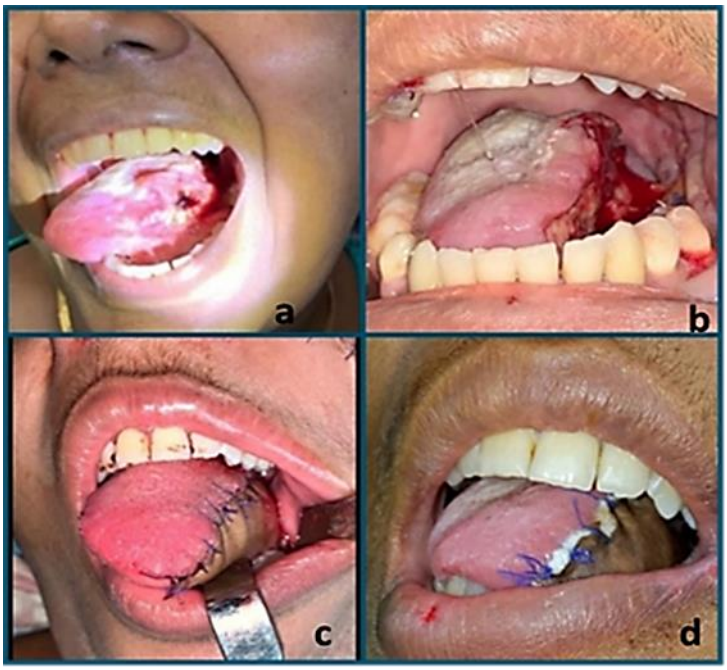

Figure 1: a- Squamous cell carcinoma tongue, b-wide local resection of the primary lesion, c-Naso-labial flap reconstruction, d-failure of the regional flap

The patient was kept in ICU for 3 days post-operatively. The reconstructive naso-labial flap initially functioned well but seemed dry, shrunken, and separating from the normal tongue tissues on 5th post-op date, suggesting a flap failure. The reason would be compromised vascularity in the submandibular region, due to extensive clearance during the neck dissection. The necrosed flap was removed under local anaesthesia on 6th post-operative day. However, an additional alternative reconstructive option for the ablative surgical site was an utmost necessity to minimize speech and swallowing problems due to partial glossectomy. Local, regional, and distant pedicled myo-mucosal flaps or free flaps from the radial forearm or anterior lateral thigh were considered as the second reconstruction.

Since she was just 28 years, and to avoid further donor site wounds and scars, a non-invasive option of platelet rich fibrin (PRF) grafting was considered for the surgical defect. As platelet regenerative agents have significant potential to super-saturate growth factors to accelerate wound healing, excisional biopsy margins were checked

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beforehand. Histopathology of the partial glossectomy (primary lesion) revealed complete resection with margins exceeding 10mm in all directions and no neck nodal involvement. The PRF graft, derived from autologous whole blood, was secured to the glossectomy defect with 3-0 vicryl sutures (Figure 2). Nasogastric feeding was initiated to minimize disturbances during meals, alongside supportive oral care, hydration, and antibiotic coverage to prevent infections.

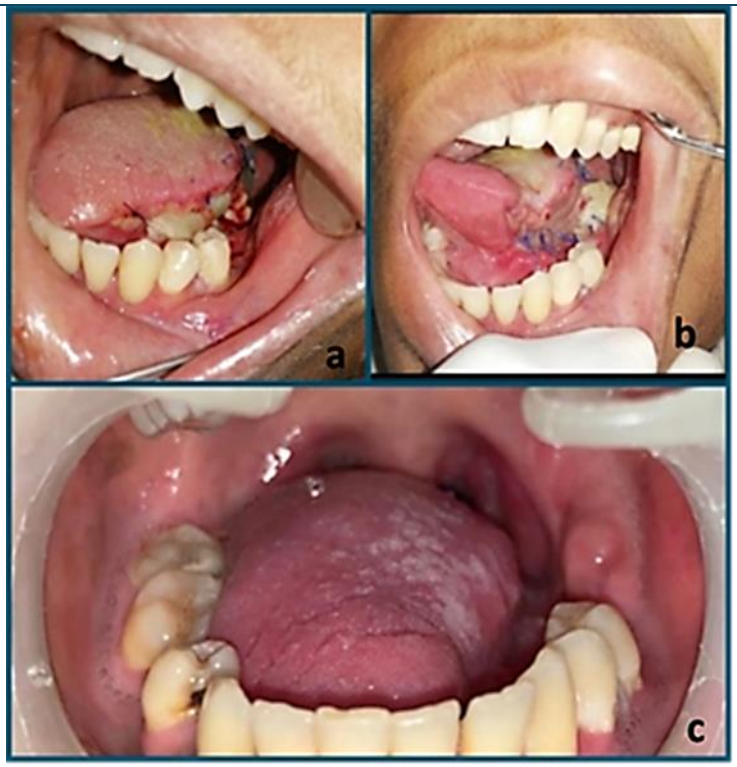

Figure 2: a & b- PRF grafted and secured with 3/0 vicryl suture, c-regeneration after three weeks

Gradual filling of the surgical defect, initially with granulation tissues and later covering with the same specialized tongue mucosae were observed during the next two weeks. Complete regeneration of the surgical defect was observed including similar architecture and near normal function of the tongue by the third week of PRF grafting. Almost no scarring was seen, and the reformed tongue tissues filled the surgical defect completely. Incisional biopsy from the epithelium and a deep biopsy from the site of regeneration after six months confirmed it as normal tongue tissue.

We obtained satisfactory results, with neither complication, tumor recurrences nor any residual tumor. The patient was very satisfied with the functional outcome and was followed up in the routine OMF clinic.

Discussion

Oral cancer has been an emerging problem for many decades in South Asia, including Sri Lanka. Squamous cell carcinoma of the oral cavity is the number 1 cancer among Sri Lankan males and number 8 among Sri Lankan females according to the Sri Lankan

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National Cancer Control Program statistics [5]. This is directly attributed to habits of betel chewing, tobacco and excessive alcohol consumption. Buccal mucosa is the commonest site of occurrence while tongue and floor of the mouth rate subsequently [5]. Tumor ablations of the tongue essentially affect the swallowing and quality of speech of the individual. Wide local resections of these aggressive lesions cause massive aesthetically and functionally unacceptable defects which need proper reconstruction to maintain social acceptance, self-esteem and personality.

Local, regional and distant flaps are recommended for post-ablative glossectomy defect reconstruction, besides radial forearm and anterior lateral thigh free flaps, the gold standards in developed world [5]. Pedicled naso-labial regional flap, used for the partial glossectomy defect reconstruction as the first option in this patient was unsuccessful. Since our patient was a young lady, considering the donor site morbidity of another local or regional surgical reconstruction, PRF grafting was preferred.

Normally a 5mm healthy tissue cuff is recommended as a safe margin to minimize tumor recurrences in oro-pharyngeal cancer primary resections. Any close or involved margins need surgical re-resection or post-op oncological management for satisfactory outcomes [5]. In this patient, tongue cancer was cleared for more than 10mm margins in all directions with no neck nodal involvement. This was a specific concern in this patient because if any cancer remnants were left behind, PRF would boost recurrence of the cancer due to a very high concentration of regenerative growth factors [6].

For hemi-glossectomy and partial-glossectomy defects, PRF grafting can be considered as a better reconstructive option than flaps. This non-invasive option would effectively cut down theatre times and reduce the length of ICU care. Since the method of PRF production is simple and non-expensive, it offers better cost-benefit. Minimum scarring of the post ablative glossectomy site with PRF mediated regeneration decreases alterations in swallowing and speech.

Conclusion

The regenerative capacities of platelet rich fibrin were effectively utilized in this intervention with precise reformation of the glossectomy defect within three weeks. These novel innovations would bring multiple benefits, not only to patients but also to multiple surgical specialties and the health sector. The new revolution of PRF for partial glossectomy defect reconstruction, which is not yet reported in the medical literature, is an alternative and better option for tumour ablated glossectomy defects management in the background of rising incidence of oral cancer.

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