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CLINICAL REPORT

Reconstruction of Subtotal Defect of the Lower Lip: Combined Use of Karapandzic and Nasolabial Flap

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Abstract Subtotal reconstruction of the lower lip after excision of the tumor is always a challenge for surgeons. It is because of the difficulty in regaining the function of the lip, including the oral competency and restoring the aesthetic subunit. A 46-year-old patient presented with an ulceroproliferative growth involving 70% of the lower lip, including the right commissure. After the confirmation to be a malignancy, patient underwent excision of the tumour and reconstruction of the lower lip using the left Karapandzic flap and right nasolabial flap. The patient was on regular follow-up in the postoperative period to assess the surgical outcomes. The combined use of Karapandzic flap and the nasolabial flap can be reliably used for subtotal reconstruction of the lower lip in advanced oral cavity malignancy, involving one of the commissures. Later can ensure good postoperative results in terms of aesthetic and functional lip reconstruction without any significant intraoperative or postoperative complications.

Keywords Lip · Karapandzic flap · Nasolabial flap · Outcomes

Introduction

Subtotal reconstruction of the lower lip after excision of the tumor is always a challenge for surgeons. It is because of the difficulty of regaining the function of the lip, including the oral competency and restoring the aesthetic subunit [1, 2]. The challenge is, even more, when there is extensive involvement of tumour, especially to the angle of the mouth. Although smaller defects can be successfully repaired with primary suturing or local rotational flaps, a subtotal defect in the lower lip often requires a dependant flap like Karapandzic flap for satisfactory structural and functional outcomes. Despite the good postoperative results, Karapandzic flaps are inevitably associate with microstomia. Again, its utility gets limited when one of the commissures of the mouth gets involved by the tumour where the nasolabial flap can be an alternative surgical option to maintain the aesthetics of the lower lip with a good functional outcome. In such circumstances, the combined use of Karapandzic flap and nasolabial flaps can be an option to be used to reconstruct the subtotal defect in the lower lip. In this surgical report, the authors presented the effectiveness of dual flaps, i.e., Karapandzic and nasolabial flaps in the reconstruction of subtotal lower lip involving the angle of mouth in advanced oral cavity malignancy.

Case Report

A 46-year-old patient presented to the Department of Otorhinolaryngology with an ulceroproliferative growth involving the right lower lip for 6 months (Fig. 1). There was a history of reduced mouth opening and bleeding from the mass for 3 months. The patient was found to have addicted to tobacco chewing for the past 8 years. On physical examination, the mass was approximately 4 × 2 cm in dimension, involving around 70% of the lower lip, including the angle of the mouth on the right side. Ultrasound of the neck revealed multiple bilateral lymph nodes involving levels 1a, 1b and II and the largest

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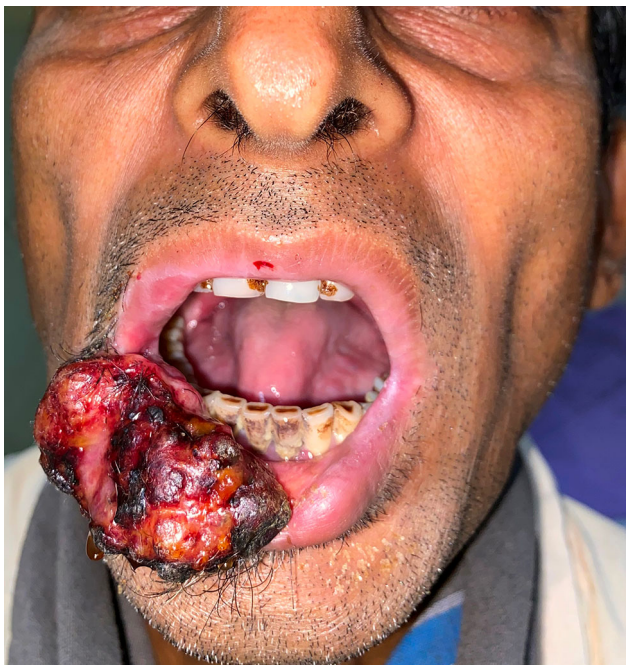

Fig. 1 Shows the tumour of the lower lip involving the anterior commissure (right side)

amongst them was 1.5 × 1 cm on right level Ib. A contrast-enhanced CT scan showed a well-defined heterogeneously enhancing soft tissue density lesion measuring 3.6 × 3.0 cm over the right lower lip involving the angle of mouth on the right side. Punch biopsy of from the growth was confirmed to be moderately differentiated squamous cell carcinoma. After a written informed consent, the patient was planned for wide local excision of the tumour with bilateral selective neck dissection and reconstruction of the lower lip under general anaesthesia.

Surgical Technique

Tumour was excised, keeping 1 cm healthy margin of the lip, which was confirmed after the intraoperative frozen section examination. The lower lip reconstruction was performed using ipsilateral (right side) nasolabial flap and contralateral (left side) Karapandzic flap. Marking was done for Karapandzic flap on the left side. The skin incisions are made at a distance equivalent to the height of the lower lip in order to maintain the normal height of the lip (Fig. 2). The superior incision was placed just lateral to the nasolabial crease incising the skin, fat and superficial layer of the facial muscle. The inner mucosal incision was made parallel to the skin incision approximately 2 cm on the left side. Meticulous dissection was made to preserve the labial arteries and buccal motor nerve. The flap was released and rotated medially. Similarly, on the right side, inferior based

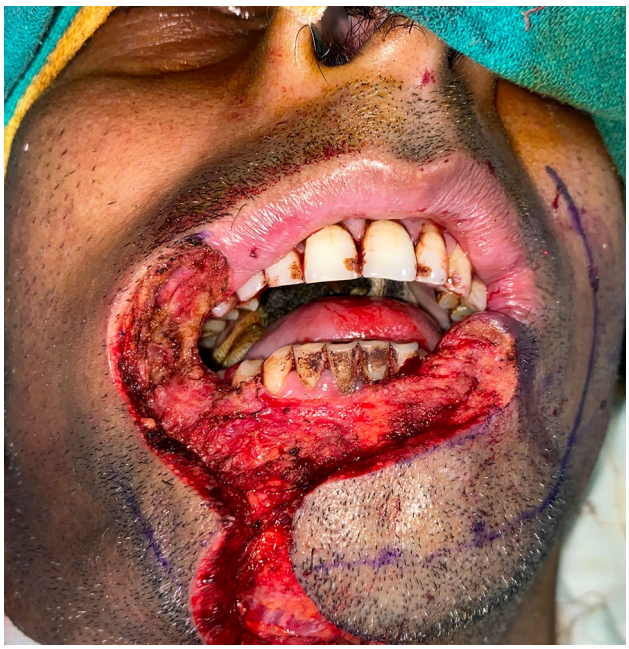

Fig. 2 Intraoperative photograph showing the soft tissue defect after excision of the tumour

the nasolabial flap was raised. The length and breadth of the flaps were demarcated after the accurate measurement soft-tissue defect, required for the soft tissue reconstruction. The plane of dissection was deep to the subcutaneous tissue and superficial to the underlying muscles [3]. Special attention was given in preserving the integrity of the facial vessels during the neck dissection on the right side. The reconstruction of the inferior based nasolabial flap has been demonstrated in Fig. 3. After the flap was raised up to the desired length, it was rotated inwards to the oral cavity through a mucosal tunnel. The flaps were sutured

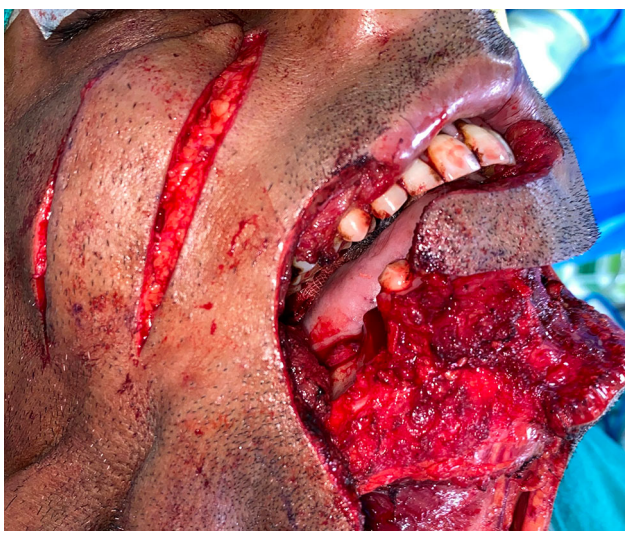

Fig. 3 Shows the elevation of the left Karapandzic flap and right Nasolabial flap

meticulously in a multilayered fashion from the inner mucosal layer to the outer skin with minimal tension (Fig. 4). The nasolabial flap was released 3 weeks after the primary surgery and commmissuroplasty was performed**.** The final histopathological report was confirmed as moderately differentiated SCC and Pathological staging, pT3N0Mx (Stage III) with features of lymphovascular infiltration. The patient was advised for adjuvant radiotherapy, based on the final histopathological report. At one month of follow-up the patient showed minimal scar formation and adequate mouth opening (Fig. 5).

Discussion

Lip plays an important role in swallowing, articulation, expression of the facial emotions along with aesthetics in the face. Hence the major goal in the reconstruction of the lip lies in restoring the function of the oral cavity and the aesthetics of the face along with adding the bulk to the lower lip. Different reconstructive options like free flaps, pedicle flaps, and local flaps have been recommended in the past for the reconstruction of the lower lip [4]. The free flaps and the distant flaps are not routinely used for the lip as they are bulky, requiring a second procedure. Again, they are inferior in maintaining oral competence, including the aesthetes compared to local rotational flaps. Although smaller defects can be successfully repaired with primary suturing or regional rotational flaps, a subtotal defect in the lower lip is a challenge, and there is no uniform guideline described in the world literature. Various flaps like Webster, Karapandzic, or Gillies, have been described in the past for the for soft tissue reconstruction of larger defects in the lower lip [4–8]. The Webster technique and its modifications have been widely used for the reconstruction of near-total defects of the lower lip with encouraging results in microstomia and competence in the oral cavity [8–11]. Similarly, the Gillies fan flap is a rotational full-thickness flap involving the upper and lower lip utilized for the reconstruction of the subtotal lower lip defect where the main disadvantages are the denervation of the lower lip [7]. In contrast, the Karapandzic flap is a local advancement flap where the labial artery and the motor nerve supply to the orbicularis oris are preserved. It is done as a single-stage procedure performed with the resection of the primary tumour, maintaining the function and aesthetics of the mouth. The major disadvantage encountered in the clinical practice with these flaps are the microstomia and distortion of the commissure [4–6, 12, 13]. The mouth opening again further comprised in patients requiring adjuvant radiotherapy in advanced oral cavity tumours. Karapandzic flap is also not an ideal flap when there is the involvement of the commissure as we do not get adequate muscle mass for its advancement. Various modifications of the Karapandzic flap have been tried for the extended involvement of the lower lip by different authors, showing good functional and cosmetic results with various degrees of microstomia [14, 15]. Abulafia et al. described a modification of the Karapandzic flap in a patient involving the lower lip and chin resection by advancing the chin and cheek [14], showing good functional and aesthetic results. Modification of the Karapandzic method has also been documented by Hanasono and Langstein [15], where they mobilized soft tissue from the perioral cheek to prevent microstomia. In the present case, we have presented a single-stage technique of using a Karapandzic flap and nasolabial flap in a case of oral malignancy involving the subtotal lip, extending to the right commissure. On the right side, Karapandzic flap could not have done because it was affecting the commissure; hence the right half of the lower lip was reconstructed with the help of the inferior based nasolabial flap. On the left side, the Karapandzic flap was raised, partially preserving the orbicularis muscle. The postoperative results in our patient was found to be satisfactory with a good functional and aesthetic outcome without any significant intraoperative complications. The mouth opening was found to be adequate in spite of the presence of oral submucous fibrosis. Encouraging results have also been observed by Gupta et al. [16], who demonstrated the single-stage technique for total reconstruction of the lower lip using a combination of an inferior based nasolabial flap with a bucket handle mucomuscular flap from the upper lip. Again, Hamahata et al. [17] described the combined use of Webster and Johanson methods for near total lower lip reconstruction in patients

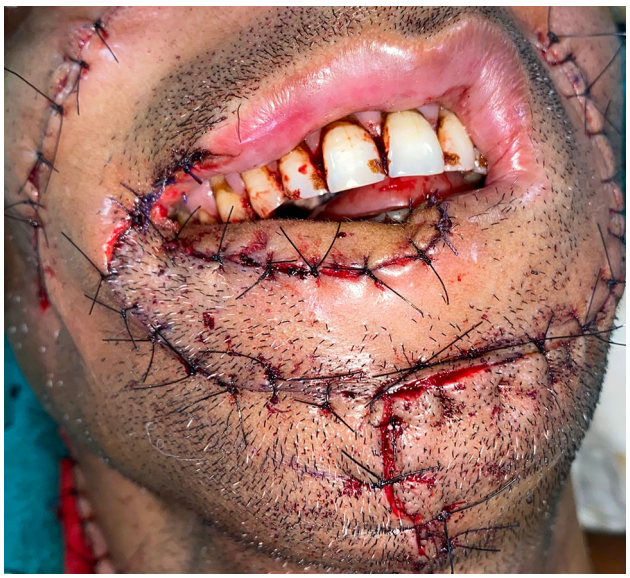

Fig. 4 Suturing of the left Karapandzic and right Nasolabial flap in the midline

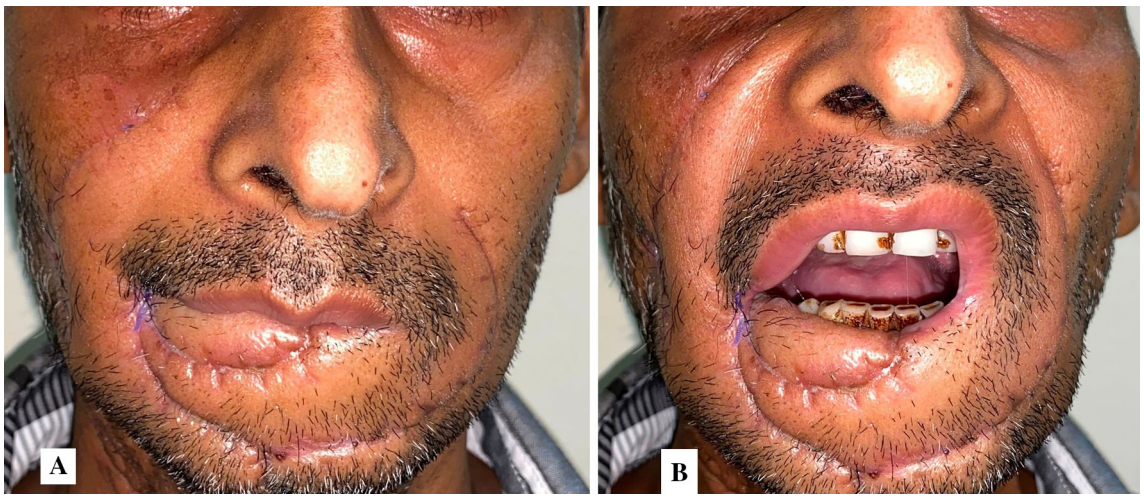

Fig. 5 **a**, **b** The photograph of the patient one month after the primary surgery

of oral cavity tumours. They suggested that the local flaps or their combinations are the ideal methods for the reconstruction of the lip in contrast to the free flaps for a better function of the oral cavity, as observed in the present case where the combined use of nasolabial flap and Karapandzic flap was performed. The patient had good oral competency, speech, and expression of speech in the postoperative period without any evidence of microstomia. Again, the aesthetic results were satisfactory because of the good color matching of the cheek skin with the lower lip. The authors advocate the combined use of Karapandzic flaps and nasolabial flap for the subtotal reconstruction of the lower lip, especially when one side of the commissure gets involved by the tumour and which is least described in the current literature.

Conclusion

The combined use of Karapandzic flap and the nasolabial flap can be reliably used for subtotal reconstruction of the lower lip in advanced oral cavity malignancy involving one of the commissures. Later can ensure good postoperative results in terms of aesthetic and functional lip reconstruction without any significant intraoperative or postoperative complications.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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