

Reconstruction of lower lip defects, Challenges and Options - Our Institutional experience

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Abstract

Introduction: Lip carcinoma constitutes 25% of all the oral cavity carcinomas. It is one of the regions which contribute to articulation of speech, oral competence and facial expression. Lip is also one of the most esthetic and erogenous zone of the face. So reconstruction of the lip is utmost necessary after tumour resection or after any form of trauma.

Materials and methods: Thirty patients, who reported to our institute Head and Neck oncology department with carcinoma of lower lip were selected for the study. Cases had growth in lower lip, angle of the mouth. Both male and female were included in the study.

Results: Of the 30 patients, 8 patients in whom less than 1/3rd of the lip was involved underwent primary closure. 9 patients in whom angle of the mouth was involved along with 1/3rd of the lower lip, nasolabial flap was used for reconstruction. 2 patients in whom whole of the lower lip

along with skin was involved, PMMC flap was used for reconstruction of the defect. 2 patients in whom more than 1/3rd of the lip along with oral commissure was involved, radial forearm free flap was used for reconstruction. 3 patients in whom 2/3rd of the lip was involved, reconstruction was done using Webster Bernard flap. In 4 patients in whom middle 1/3rd was involved reconstruction was done using karapandzic flap. Another 2 patients underwent bilateral nasolabial flap repair whose defect was involving whole of the lower lip along with oral commissure.

Conclusion: Lip plays a vital role in facial esthetics. So surgeon should use most appropriate method to reconstruction of this defect. In our experience the most satisfactory outcome was seen in the patient treated with the free flap in terms of cosmetic, size of stoma and dribbling of saliva.

Keywords: lower lip, reconstruction surgery, surgical flap

Introduction

Lip carcinomas constitute 25% of all the oral cavity carcinomas. It is one of the structures which contribute to articulation of speech, oral competence and facial expression. Lip is also one of the most esthetic and erogenous zone of the face. It also acts as a tactile organ since it is innervated by many nerve endings. So reconstruction of the lip is utmost necessary after tumour resection. Reconstruction of the surgical defect posts mainly 3 challenges: Microstoma, Dribbling of saliva and cosmetic deformities. There are over 200 methods described since 1000BC out of which many are considered to be ideal but none of them is suitable or perfect for reconstruction of a particular defect [1].

We operated 30 cases of carcinoma of lower lip who reported to our Department of Head and Neck Oncology, State Cancer Institute, Guwahati, Assam. Their management and post management outcome are described. Out of 30 cases, all were managed with surgery followed by with or without adjuvant therapy. Post excision of the tumour, lip was reconstructed by Radial forearm free flap, Karapandzic flap, Nasolabial flap, Webster Bernard flap and Pectoralis major myocutaneous (PMMC) flap. Outcome was seen in terms of size of the stoma, drooling of saliva, flap viability and cosmetic.

Materials and methods

Thirty patients, who reported to our Institute Head and Neck oncology department between September 2019 to February 2021 with carcinoma of lower lip were selected for the study. The study was conducted in line with The Declaration of Helsinki and with the approval and number 32 of the Institutional Ethics Committee. Cases had growth in lower lip, angle of the mouth. Both male and female were included in the study. Cases presented with T1, T2, T3 and T4 disease. Among the operated cases

unilateral neck dissection or bilateral neck dissection was done depending on the primary involvement area.



Figure 1: squamous cell carcinoma involving the lower lip reconstructed using karapandzic flap. (a) pre-operative view (b) after wide excision, note the commissure is maintained (c) in setting of the flap (d) one month post-op, note the mouth opening is adequate.

All the lip defects were caused by resection of squamous cell carcinoma. The surgical reconstruction technique was based on the extent and location of the defect. A safety margin of 1cm was kept in all the cases and pathological reports revealed all margins were free of tumors for all the cases. While reconstructing, emphasis was given to the continuity and innervation of the orbicularis oris muscle. Cases were repaired primarily [fig 5], using Webster-Bernard flap, PMMC flap, karapandzic flap [fig 1], Inferiorly based nasolabial flap [fig 2], 2 cases were repaired with Radial forearm free Flap with Palmaris Longus Sling. [fig 3]



Figure 2:(a) wide local excision of the involved site i.e the commissure and lower 1/3rd of the lip.(b)post -op result which was reconstructed using inferiorly based nasolabial flap (c) another patient post of result whose entire lower lip was reconstructed using bilateral nasolabial flap



Figure 3: (a) pre-operative photo of the involved site (b) harvesting of the radial forearm free flap (c) reconstructed the defect site (d) 1 month post-op result



Figure 4: (a) Pre-operative photograph showing large tumour involving the skin, more than 2/3rd of lower lip (b) 1 month post-operative photo which was reconstructed using PMMC flap



Figure 5: (a) wide excision of T1 lesion (b) primary closure of the defect

Follow up was done after 1 week, then after 1 month interval. The patients were evaluated in the postoperative

period in terms of microstoma, flap viability, drooling of saliva and cosmesis.

Results

Of the 30 patients, 8 patients in whom less than 1/3rd of the lip was involved underwent primary closure. 9 patients in whom angle of the mouth was involved along with 1/3rd of the lower lip, nasolabial flap was used for reconstruction. 2 patients in whom whole of the lower lip along with skin was involved, PMMC flap was used for reconstruction of the defect. 2 patients in whom more than 1/3rd of the lip was involved along with involvement of the oral commissure, radial forearm free flap was used for reconstruction. 3 patients in whom more than 2/3rd of the lip was involved without involvement of the oral commissure, reconstruction was done using Webster Bernard flap. 4 patients involving the middle 1/3rd was reconstructed using karapandzic flap, 1 patient had microstoma. Another 2 patients in whom whole of the lower lip along with oral commissure was involved, bilateral nasolabial flap was used for reconstruction. Wound dehiscence was seen in 2 cases of nasolabial flap in the donor site, microstomia was seen in 2 cases of Webster Bernard flap along with drooling of saliva in 1 case. Another 1 case which was reconstructed with PMMC flap had drooling of saliva along with oral incompetence. Central notching of the lower lip was seen in one case of bilateral nasolabial flap and one case of Webster-Bernard flap. 1 case of nasolabial flap gave away the digastric sling. However none of our cases developed any form of flap necrosis.

Discussion

Lip cancer is one of the commonest oral malignancies all over the world accounting for 15% of the cases. The prevalence of lower lip is 20 times higher than that of upper lip [2,3]. The primary goal of lip reconstruction is to

maintain the competence of the oral sphincter so emphasis should be given adequate coverage of the red and adjacent skin. Over the period of time approximately 200 techniques has been described in literature [4].

It is always necessary to evaluate the extend of the disease when planning for a lower lip repair. The repair technique varies depending upon the amount of tissue loss. Wedge or V shaped resection and primary closure is the very common options for repair of defects of up to one-third of the lip area. However defect of full thickness requires accurate approximation of the 3 tissue layers mucosa, muscle and skin. Defect with more than one third requires more complex reconstruction and may involve the use of pedicle flap or free flaps[5].For T1 lesion of the lower lip we did primary closure of all the cases[fig 5]. Esthetic and functional outcome was good in all these cases.

In case of disease involving the middle third of the lip or more than 2/3rd of the lower lip orbicularis advancement flap is generally used. This technique is used because the innervation of the remaining lip is maintained which is essential for its function. We used karapandzic flap for reconstruction of the middle third of the lip (Figure1).In 1974, Karapandzic[6] described the use of the myocutaneous neurovascular flap, avoiding sections of muscle fibers of the oral orbicularis and causing minimal sensory and motor damage, for losses of 60–80% of the lip. Although it's an innervated flap, due to its advancement for large defect, it reduces the lower lip to a tightened band. The main disadvantage of this flap is rounding of the corner of the mouth and in some cases leading to microstomia. And also due to the cheek advancement flap there is obliteration of the anterior gingiva-buccal sulcus leading to decrease in its functional efficacy.

In case of subtotal defect of the lower lip where commissure was not involved we used Webster Bernard flap for reconstruction. In 1853, Bernard[7] presented this technique. Subsequently, this procedure underwent modification by Ginestet[8] in 1946, Freeman[9] in 1958, and Webster et al.[10], in 1960. This technique involves the advancement of the cheek tissue and remaining lower lip medially. Triangular curvilinear upper and lower incisions are planned along the nasolabial and labiomental creases. Burow's triangles are excised from the upper incisions. Lower incisions can often be advanced without creating any triangles. Since adjacent cheek is advanced, a large area of the lip can be reconstructed without creating microstomia. However our two patient developed microstomia. Another disadvantage sometimes seen is the notching in the central lip area.

Tumors involving the commissure along with 1/3rd of the lower lip or entire lower lip were reconstructed using unilateral or bilateral nasolabial flap. This flap is greatly use in facial reconstruction because of its accessibility, reliability and easy to master. This flap was first described by Von Bruns, in 1857. We reconstructed 9 cases using this flap in which 3 cases developed wound dehiscence in the donor site area. However dribbling of saliva or microstomia was not seen.

When there is a defect involving mainly the upper lip we preferred to use abbe flap. The abbe flap is well suited for reconstruction of both the upper and lower lip[11]. However it is more commonly used as lower lip transferred to the upper lip where both the lateral and central part of the lower lip is used. In this study we have not included it.

The reconstruction of the lower lip defect become challenging when the whole of the lower lip along with skin and mucosa is involved. In this situation we preferred

regional flap or free flap .When regional flap was taken into consideration PMMC flap was an option and radial forearm flap was used as a free flap. Esthetic outcome was compromised when PMMC flap was used but radial forearm flap provided as a good source for reconstruction of large defect. Oral competence was not seen in one case who also had dribbling of saliva. The radial forearm flap has been used extensively because of its thin profile, long pedicle, and reasonable color match[12,13]. When radial forearm flap was used, palmaris longus tendon was also taken as a sling to support the flap. Other alternative to radial forearm can be anterolateral thigh flap. The primary advantage over radial forearm free flap is that unlike it's donor site ALT donor site does not require skin grafting. The ALT flap is ideal for large through-and-through cheek defects with lip involvement when two skin islands are required [14,15] However we have not used ALT till date for lower lip reconstruction, so our experience with this flap is limited.

Conclusion

Lip plays a vital role in functional and facial esthetics. So surgeon should use most appropriate method to reconstruction of this defect. Surgeons must also consider defect characteristic like remaining tissue after resection, skin laxity and most importantly patient's opinion for the surgery. In our experience the most satisfactory outcome was seen in the patient treated with the free flap .Outcome was observed in terms of cosmetic, size of stoma, dribbling of saliva. When the defect is less than 1/3rd primary closure gives a better outcome. When the defect is more than 1/3rd or involving the middle third without involving the commissure, karapandzic flap is always suitable. Defect of 2/3rd or more without involvement of the oral commissure should go for Webster Bernard flap. If oral commissure is involved in the defect than radial

fore arm is the better option in giving a good esthetic and functional outcome. Defect involving the whole of the lower lip along with oral commissure, bilateral nasolabial flap can be a good option. When the tumour is involving the whole of the lower lip along with skin and subcutaneous tissue , regional flap like PMMC can be an option but oral competence and dribbling of saliva may be seen. Continuity of the vermilion was observed only in the cases repaired primarily or by lip rotation, however, with some degree of microstoma. whatever may be the reconstruction option, aggressive mouth opening exercise and oral hygiene maintenance is utmost necessary.

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