OUTCOME OF RECONSTRUCTION OF LOWER LIP SQUAMOUS CELL CARCINOMA IN DIFFERENT TREATMENT MODALITIES

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ABSTRACT
Objective: To evaluate the treatment options available for reconstruction of lower lip following tumor resection with regard to applicability, reliability, functional standpoint and complications.
Study Design: A descriptive case series.
Setting & Duration: Department of Plastic and Reconstructive Surgery, Liaquat University of Medical and Health Science, Jamshoro from January 1998 to December 2007.
Methodology: All cases of lower lip reconstruction secondary to biopsy proven squamous cell carcinoma resection were analyzed. The functional aspects of the reconstruction were reviewed in terms of the size of the oral stoma and preservation of oral competence. The esthetic outcome was assessed and in addition the symmetry of the commissure at rest and function. The complications were noted along with routine oncological follow-up.
Results: The age of the patients ranged from 26 to 81 years and there were 57(43.31%) males and 19(14.44%) females. Karapandzic flap was done in 12 patients (15.78%), bilateral Karapandzic flap was done in 11 cases (14.47%). Abbe flaps were performed in 14 cases (18.42%), while 6 other cases (7.89%) were reconstructed with bilateral fan flaps. Bilateral Webster techniques and mucosal advancement was used in 6 cases (7.89%).
Conclusion: Early detection is essential for the successful treatment of squamous cell carcinoma of lower lip. To re-establish function and appearance, and to achieve best possible results residual normal lip tissues should be included in reconstruction.

KEY WORDS: Squamous Cell Carcinoma, Tumor Resection, Lower Lip Reconstruction

INTRODUCTION

The first evidence of lip reconstruction is witnessed as far back as 3000 BC in Hindu writings, as well as in the Sanskrit writings of Susruta in 1000 BC. Several contemporary procedures are newer renditions of techniques first explained by Dieffenbach, Sabatini, Abbe, and Estlander in the 19th century.[1]

The most frequent type of lip carcinoma is squamous cell carcinoma (SCC), accounting for approximately 90% of all lip malignancies. Presently, surgery and/or radiotherapy are considered the standards of care for SCC of the lip.[1-4] Lips have important functional and aesthetic roles in daily living. They are the focal point of the lower face, with several aesthetic units intricately controlled by a complex series of muscles. Several key factors including exceptional anatomy makes reconstruction of the lower lip especially challenging.

The aim of reconstruction is always reinstatement or preservation of function and aesthetics. Aesthetic considerations include suitable symmetry and normal anatomic proportions, presence of a philtrum, normal oral commissures, and establishment of a vermilioncutaneous white border.

Post ablative defects of one third or less of the lower lip can be repaired by primary closure with variations of incisions with excellent functional and aesthetic

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results.[5,6] In case of larger lip defects, lip reconstruction becomes more challenging.[3,7-13] Due to lack of facilities of microsurgery, the reconstruction has become a step-wise procedure in our setup. One more difficulty is the lack of frozen section, so to achieve clear margins always remain questionable. Despite all these obstacles, the challenge is worth accepting as we want to give the patient a better quality of life.

METHODOLOGY

This descriptive study was conducted at Department of Plastic and Reconstructive Surgery, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan. For study purpose a Proforma was designed and medical records of 76 cases of carcinoma of lip treated over a time period from January 1998 to December 2007 were analyzed. All the information related with disease and management was noted.

RESULTS

Over a 10 year period from January 1998 till December 2007, 76 cases of lower lip squamous cell carcinoma were operated at Department of Plastic and Reconstructive Surgery, Liaquat University of Medical and Health Science, Jamshoro.

The age of the patients ranged from 26 to 81 years and there were 57(43.31%) males and 19(14.44%) females. All cases were treated with surgical excision and immediate reconstruction. Following resection, the resulting defects ranged from 1/3 of the lip to total lip loss. Bilateral Suprahyoid block dissection was done in 11 cases (8.36) presenting with widespread lower lip T4 lesions. Karapandzic flap (orbicularis oris myocutaneous flaps) was used in 12 patients (15.78%), whereas bilateral Karapandzic flap was done in 11 cases (14.47%). Abbe Lip switch flap was performed in 14 cases (18.42%), while 6 other cases (7.89%) were reconstructed with bilateral fan flaps for vermilion reconstruction by mucosal advancement. Bilateral Webster techniques and mucosal advancement was used in 6 cases (7.89%). All cases were assessed for early postoperative results in terms of flap viability and wound infections and for late results emphasizing on oral continence, microstomia, and aesthetic outcome, in addition to the usual oncological follow-up. The follow-up phase ranged from 6 months to 1 year. 14 patients were lost to follow-up after the first postoperative month. All flaps done in this study survived completely. The age distribution is summarized in Table I. Whereas size of defects, reconstructive procedures used are summarized in Table II. In early postoperative period, minor wound infections were observed in some cases but resolved spontaneously.

Age Group	No. of cases	%
> 30 years	5	6.57
31-40 years	9	11.84
41-50 years	33	43.42
51-60 years	15	19.73
61-70 years	10	13.15
71-80 years	4	5.26
Total	76	100

Table I. Age distribution of cases (n=76)

With regards to oral continence, the best results were achieved in those cases treated with direct closure and with flaps utilizing residual lip tissue i.e. the Karapandzic technique and the Abbe (lip switch) flaps. Microstomia was observed in 13 cases (9.8%). They all had defects involving greater than half of the lower lip and all were primarily reconstructed with the unilateral and bilateral Karapandzic technique. Partial wound breakdown of the Karapandzic flaps resulting in lip notching was observed in three cases which then improved with the addition of the Abbe flaps. The final cosmetic results was assessed objectively and were graded as excellent in cases treated by primary closure, good to satisfactory in cases treated with the Karapandzic technique (Figs. 1-4) and Abbe flaps, satisfactory to fair in cases treated by other techniques. Local recurrence was observed in 11 cases (8.36%) during follow-up period.

DISCUSSION

Following lip resection, reconstruction by applying the principle of like for like should be followed whenever possible.[14] However, this may not be easily achievable with large defects and when there is scarcity of tissues of similar qualities. Nevertheless, the method of lip reconstruction should aim at maintaining sphincter function, retaining adequate sensation which prevents sialorrhea, acquiring an adequate mouth opening, and achieving an aesthetically pleasing outcome and skin coverage. Indeed, the choices for lip reconstruction in descending order of preference are tissues from the remaining lip, the opposite lip, the adjacent cheek and distant tissues.[6,15] Lip defects may result from a variety of pathologies such as vascular malformations, traumatic tissue loss after trauma, burns, and tumors. Anatomically, those defects can be classified into simple skin defects, vermilion defects or full thickness defects. Resection of lip carcinoma usually results in full thickness defects, although individual vermilion defects may result after lip shave procedure for leukoplakia, or carcinoma in

Defect Size	Reconstructive Procedure	No. of cases	Percentage
1/3	Barrel-shaped excision	3	3.9
1/3	W shaped closure	8	10.5
1/3	V shaped closure	4	5.26
1/3	Abbe Estlander flap	6	7.89
2/3	Bilateral fan flaps (for vermilion reconstruction)	6	7.89
2/3	Bilateral Webster Bernard modification + mucosal advancement (for vemilion reconstruction)	2	2.63
2/3	Bilateral Karapandzic flaps	11	14.47
1/2	Karapandzic flaps	12	15.78
1/2	Abbe flap (Lip switch)	14	18.42
1/2	Unilateral nasolabial flap	4	5.26
Complete lip defect	Bilateral nasolabial flaps	6	7.89

Table II. Treatment Modalities used for reconstruction of Lower Lip (n=76)

situ.[16] There are various classifications from the reconstructive point of view for different sizes of full thickness lip defects.[6,16,17] Stranc classified full thickness lip defects into defects less than one third, defects ranging from one third to one half and defects more than one half of the lip width.[17] As regards full thickness defects from one third to one half, common techniques described are Karapandzic technique, Abbe or lip switch flap, and Johanson's step technique.[3,7,18] In the present study, the former two techniques were used. Karapandzic described his technique as a modification of Gilles advancement fan flaps which were denervated.[3,14] Karapandzic technique is essentially a bilateral orbicularis oris myocu-taneous advancement flap.[3] This entails mobilization of the remaining lip segments starting with the skin and mucosal incisions parallel to

Fig. 1. (a) Pre-Operative **Fig. 1. (b) Post-Operative** **Fig. 2. (a) Pre-Operative** **Fig. 2. (b) Post-Operative**

Fig. 3. (a) Pre-Operative **Fig. 3. (b) Post-Operative** **Fig. 4. (a) Pre-Operative** **Fig. 4. (b) Post-Operative**

the lip margin from the lower edges of the rectangular defect and extending laterally into the nasolabial folds. Orbicularis muscle can then be separated from the surrounding tissues while retaining its nerve and blood supply and produce a competent oral sphincter, and an aesthetically pleasing result. This method has been classically used and advo-cated to be used for defects involving up to two thirds or 80% of the lower lip.[3,8] However, Stranc believed that this technique should be limited to defects 4cm or less i.e. one half of the lower lip as microstomia with its potential problems will certainly occur.[17] It is worth mentioning that the definition of microstomia should not be a measurable one Jabaley mentioned that if the stoma is large enough to admit a fork or spoon laden with food, this is probably sufficient and the patient is unlikely to ask further surgery.[8] In the present study, Unilateral and bilateral Karapandzic technique was used in 23 cases. Regardless of the cause, if microstomia develops, it may be corrected with bilateral commissu-rotomy, splints or flaps.[17,19-21] However, commissuro-tomy may entail division of muscle fibers and may result in sphincter weakness and obviate the value of the Karapandzic technique in preserving oral compe-tence. On the other hand, splints require high patient compliance and may be cumbersome to use. In an att-empt to correct this problem without disturbing primary lip repair with the Karapandzic technique by leaving the commissures intact, lower lip augmentation with a lip switch Abbe flap from the upper lip in a second stage has been successfully used by many authors.[16,22]

As regards simple Abbe flaps from the upper lip, these are suitable for defects of up to one half of the lower lip, and up to one fourth of the upper lip can be harvested without problems.[6,7,17] Although it is a two-stage procedure, the flap has the advantage of adding the missing tissue to the lower lip without the additional facial scarring and without the mild distortion or the roundness of the commissures, both of which are created by the Karapandzic technique.[23] In the present study, two cases were reconstructed by the Abbe Estlander technique and 14 cases were treated with Abbe Lips switch flap.

Bilateral Webster Bernard modification and bilateral fan flaps are popular methods described in the literature.[2,6,14,16,23] The fan flap entails transposition of nasolabial skin and mucosa into the lower lip after division of the orbicularis muscle. The blood supply is superior.[14] However, the fan flap is a completely denervated flap.[16]

CONCLUSION

Surgical procedures used for lower lip reconstruction should incorporate potentially innervated muscle fibers, because sphincter function and lip continence is most significant target to achieve. Mucosal advancement showed satisfactory results. For defects of 1/2 of lower lip, Karapandzic flap or Abbe flaps can be used. For defects of up to 2/3 of the lower lip, Karapandzic flaps with or without the secondary addition of upper lip switch flaps can be used. As for defects larger than 2/3 or involving the total lip flaps from adjacent cheek or chin muscles may be a realistic choice. In total lower lip loss with conserved commissures bilateral nasolabial flap is a good option.

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