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METHODS AND RESULTS OF SURGICAL TREATMENT OF ACQUIRED TISSUE DEFECTS IN THE LIPS

Eyyad Ali Aysha*, Fadi Kash and Ghanem Ahmad

Department of Plastic Surgery, Tishreen University, Faculty of Medicine, Lattakia, Syria.
Department of Plastic Surgery, Professor, Tishreen University, Faculty of Medicine, Lattakia, Syria.
Department of Vascular Surgery, Professor, Tishreen University, Faculty of Medicine, Lattakia, Syria.

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***Corresponding Author: Eyyad Ali Aysha**

Department of Plastic Surgery, Tishreen University, Faculty of Medicine, Lattakia, Syria.

ABSTRACT

Background: Lips provide some important roles from social interaction and expressing emotion to oral competence and swallowing, and there were wide range of reconstructive options. **Aim:** The purpose of this study was to evaluate final outcome of acquired lip defects reconstruction. **Materials and Methods:** A retrospective study was conducted for the period five years (May 2017 – May 2021) at Tishreen University Hospital in Lattakia-Syria. The study included a group of patients with acquired lip defects who underwent reconstruction with various methods. Patients were classified into three group according to the size of defect; group I included patients with size defect smaller than one-third of lip (14 cases), group II included patients with defects in the size one-third to two-third(17cases), and group III included patients with defects larger than two- third of lip (1 case). **Results:** A total of 38 patients, 25 males (65.8%) and 13 females (34.2%) with a mean age of 59.8±6.2 years were included in the study. Cancer was the most frequent etiology of defects in 30 cases (79%), followed by trauma in 8 cases (21%). Defects were located more frequently on lower lip in 34 cases (89.5%) and defects were full- thickness in 32 cases (84.2%). 53. 1% of the defects were in the size one-third to two- third of the lip, and methods of reconstruction varied according to the size of defect. Primary closure was performed in 100% of the patients in group I. In group II; primary closure was applied in 64.7%, Karapandzic flap in 23.5%, and Estlander flap in 11.8%. Karapandzic flap was applied in patient with defect size larger than two- third of the lip. The rate of complication in group I was 28.6 % and hypertrophic scars represented the most frequent complication which observed in 14.3%, whereas in group II complications developed in 52.9% and blunting of the commissure was occurred more frequently (23.5%). Flap necrosis represented the observed complication in group III. Complications developed significantly with advanced age and in presence of smoking($p<0.05$). **Conclusion:** The current study demonstrated that by analyzing the various defects of lips, we could identify the proper method of lips defects reconstruction.

KEYWORDS: Lip, reconstruction, outcome, acquired, defects.

INTRODUCTION

Lips are considered an essential part of the human face which play an important role in facial expression and provide competence to the oral cavity during mastication and at rest. Lip is composed of three layers: mucosal layer within oral cavity, middle muscular layer and outer mucosal layer.[1,2]

Lip defects can result from congenital or acquired problems. Acquired defects are frequently result from oncologic resection, trauma and burns. Defects are classified according to their depth and size to superficial defects that involve skin and vermilion, and full thickness defects that include underlying muscle, nerves and arteries.[3]

Reconstruction of lip defects is considered therapeutic challenge and we need to achieve good esthetic quality and conservation labial function. It is guided by defect location, size and depth. Lip reconstruction techniques were reported as early as 1000 BC in India, then tissue transfer techniques were popularized in the late 16th century. Finally, Abbe and Estlander flaps were used in the late 19th century.[4]

Defects can be closed primarily or by using flaps with varying degrees of success regarding aesthetic and functional results. There are many factors can interfere with the choice of proper method of reconstruction which included presence of previous surgery, comorbidities, compliance, and the pathogenesis responsible for defects.[5,6] Several studies have evaluated advantages and disadvantages of each method of reconstruction. Therefore, the aims of our study were: 1- to elucidate the preferable method for reconstruction of acquired lip defects according to the size of defect, 2- to determine outcomes of lip reconstruction.

Patients and Methods Study Population

After approval by local research ethics committee, a retrospective study was conducted in patients seen at department of plastic surgery at Tishreen University Hospital in Lattakia-Syria during five years' period (May 2017 – May 2021) with a variety of clinical situations of acquired defects of lips that required reconstruction.

Inclusion Criteria were as follows: All patients of both sexes and all ages with an acquired defects resulting from various etiologies. **Exclusion Criteria:** Patients with congenital malformations, chronic diseases that affect on wound healing, patients who received treatment with glucocorticoids, and burned patients. The following workup included: history and physical examination were performed. Characteristics of the defects were recorded: etiology, size, and location. Patients assigned according to the size of defect to three groups: group I included patients with defect size <1/3(14 cases), group II included patients with size 1/3-2/3(17 cases), and group III included patients with defect size>2/3(1case). Patients were followed up at regular intervals in the post-operative period by taking photographs and comparison with photographs before surgery. Complications were recorded in each group.

Statistical Analysis

Statistical analysis was performed by using IBM SPSS version20. Basic Descriptive statistics included means, standard deviations(SD), Frequency and percentages. Chi- square test was used to study the relation between categorical variables. Independent t student test or Mann Whitney was used to compare 2 independent groups. All the tests were considered significant at a 5% type I error rate($p<0.05$), β:20%, and power of the study:80%.

RESULTS

The baseline characteristics of the participants were as shown in (Table 1). Males represented 65.8 % of the study population and females 34.2 % with male: female ratio was 1.9:1. Ages range from 20 years to 69 years (mean 59.8±6.2 years), and patients according to the age groups as follow; 20-30 year (5.3%), 30-40 year (13.1%),40-50 year (18.4%), and>50 year (63.2%). Smoking was present in 25(65.8%), the defects had occurred as a result of tumors in 30 cases (79%) and trauma in 8 cases (21%). With regard to the affected areas, the lower lip was the most commonly affected which observed in 34 cases (89.5%), followed by upper lip in 3 cases (7.9%) and combined location was observed in 1 case (2.6%). Full-thickness defects were detected in 32 cases (84.2%) and split thickness defects in 6 cases (15.8%). Defects smaller than one-third of the lip were detected in 14 cases (43.8%), one-third to two-third in 17 cases (53.1%) and larger than two-third of the lip in one case(3.1%).

Table 1: Demographic characteristics of the study population.

Variable	Result
Sex	
Male	25(65.8%)
Female	13(34.2%)
Age(years)	59.8±6.2(Range 20-69)
Age groups (n: %)	
20-30	2(5.3%)
30-40	5(13.1%)
40-50	7(18.4%)
>50	24(63.2%)
Etiology of defect	
Cancer	30(79%)
Trauma	8(21%)
Smoking	
Present	25(65.8%)
Absent	13(34.2%)
Location of the defect	
Lower lip	34(89.5%)
Upper lip	3(7.9%)
Combined location	1(2.6%)
Defect depth	
Split thickness	6(15.8%)
Full-thickness	32(84.2%)
Size of defect	
<1/3	14(43.8%)
1/3-2/3	17(53.1%)
>2/3	1(3.1%)

Primary closure was applied in all cases of the defects smaller than one-third of lip (14:100%). In patients group with defects range from one-third to two-third, primary closure was performed in 11 cases (64.7%), Karapandzic flap in 4 cases (23.5%) and Estlander flap in 2 cases (11.8%). Karapandzic flap was used for reconstruction the only case with defect size larger than two-third of the lip.

Table 2: Reconstruction methods of the study population according to the defect size.

Size of the defect	Method of reconstruction	N (%)
<1/3	Primary closure	14(100%)
1/3-2/3	Primary closure	11(64.7%)
	Karapandzic flap	4(23.5%)
	Estlander flap	2(11.8%)
>2/3	Karapandzic flap	1(100%)

Complications that developed after lip reconstruction were classified according to the defect size as follow: hypertrophic scars (14.3%), misalignment of the vermilion border (7.1%) and wound dehiscence (7.1%) in patients with defect size smaller than one-third of lip. Patients with defects range in size from 1/3 to 2/3 developed the following complications: blunting of the commissure (23.5%), microstomia (17.6%), and flap necrosis (11.8%). Wound dehiscence represented the only observed complication in patients with defects larger than two-third of the lip.

Table 3: Complications according to the size of defect.

Size of the defect	Complication	N (%)
<1/3		
	Hypertrophic scars	2(14.3%)
	Misalignment of the vermilion border	1(7.1%)
	Wound dehiscence	1(7.1%)
	No complication	10(71.4%)
1/3-2/3		
	Blunting of the commissure	4(23.5%)
	Microstomia	3(17.6%)
	Flap necrosis	2(11.8%)
	No complication	8(47.1%)
>2/3	Wound dehiscence	1(100%)

As shown in table(4), complications were occurred more frequently in advanced age(62.4±3.2 versus 56.2±4.9,p:0.0001) and in presence of smoking(78.6% versus 21.4%,p:0.001) without presence of significant difference according to sex(p:0.8).

Table 4: Complications according to the demographic characteristics.

Variables	Complication		P value
	Present	Absent	
Sex			
Male	10(71.4%)	15(62.5%)	0.8
Female	4(28.6%)	9(37.5%)	
Age	62.4±3.2	56.2±4.9	0.0001
Smoking			
Present	11(78.6%)	14(58.3%)	0.001
Absent	3(21.4%)	10(41.7%)	

DISCUSSION

This retrospective study of acquired lip defects in 38 patients assessed characteristics of the defects, as well as complications occurring after reconstruction. This study showed the main findings: First, patients were of a wide range of ages and approximately two-third of patients were older than 50 years and males. Lower lip was the most affected part, and cancer represented the most frequent etiology of defects, which might be explained by the dual carcinologic risk factors of both UV exposure and smoking. Full thickness defects were observed more frequently than split thickness, approximately in more than three-quarter of patients. Second, 55% of the defects were with size one-third to two-third of the lip surface, and various methods were used for lip reconstruction which included primary closure, flaps according to the characteristics of the defects. Finally, hypertrophic scars represented the most frequent complication in defect with size less than one-third of the lip surface, whereas blunting of the commissure was observed more frequently in patients with defect size 1/3-2/3. Wound dehiscence was the only observed complication in defect size larger than 2/3 of the lip surface. The results of current study are consistent with the previous studies.

Melhem F (2022) showed in a study conducted in Syria during two years and included 10 patients who underwent lip reconstruction for defects resulting from cancer excision with Gillies flaps that functional and aesthetic results were satisfactory without any significant complication after surgery.[7]

Siqueira et al (2012) demonstrated in a study conducted during one year in 30 patients with full-thickness defects in lower lip resulting from excision of tumors that 60% of the patients were with defect size 30-80%. Methods of reconstruction varied according to the defect size; primary closure in defects smaller than 30%, myomucosal or mentolabial flaps for defects (30-80%), Abbe-Estlander for defects that included adjacent commissure, and Webster-Bernard flaps for defects larger than 80% with appropriate aesthetic and functional results.[8]

Mirza M (2016) showed in a study conducted in 12 patients during three years with lip defects resulting from tumor excision that majority of the patients were males in advanced ages. Methods of reconstruction varied according to the site of defect as follow; cheek advancement and rotation flaps for commissure tissue defects, karapandzic flaps for lower lip defects, and cheek advancement and switch lip for upper lip defects. The rate of complications was 16.6% which included wound dehiscence (8.3%) and microstomia (8.3%).[9]

Dadhich et al (2020) showed in a study conducted in 89 patients with acquired lip defects during10 years that

majority of the patients were males in advanced ages and cancers represented the most frequent cause of defects. Various methods were used for reconstruction according to the defect size as follow; primary closure for full thickness defects less than 1/3 of the lip surface, (Abbe, Estlander, karapenzic) flaps for defects with size 1/3-2/3, and distant flaps for sub total defects. Complications included mainly reduced stoma, flap necrosis, and hypertrophic scars.[10]

Shaikh et al (2022) demonstrated in a study conducted in 21 patients with acquired lip defects resulting from tumors mainly during two years that majority of patients were males in advanced ages. Methods of reconstruction varied according to the defect size which ranges from primary closure for defects less than one-third of lip surface to local or distant flaps with occurrence number of complications such as reduced stoma, local scars and blunting of the commissure.[11]

Limitations of this study were: limited number of patients and require further validation with a multi-Centre studies and it was a retrospective study and had heterogeneity of the study population.

CONCLUSION

The current study demonstrated that it is essential to analyze characteristics of the defects and location to identify the best technique for lip reconstruction to optimize patients' outcome.

Recommendations

It is essential to take surgical decision in combination with patient regarding requirements of surgery, social needs, and number of required surgeries. In addition to, reducing sun exposure to prevent development of lip cancers and smoking cessation to improve final outcome.

Declarations Competing of Interests

All the authors do not have any possible conflicts of interest.

Ethical consideration

After discussing the study with the patients, all of them gave a complete and clear informed consent to participate in the study. This study was performed in accordance with the Declaration of Helsinki.

Availability of data and materials

Most of the data was in the article, and other data can be asked from the corresponding author.

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Author contributions

All authors performed the measurements and wrote the article. Literature review was done by Dr. Eyyad Ali Aysha, and all authors performed analytic calculations.

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