

Evaluation of Vermilion-Mucosa Flaps for Reconstruction of Oral Commissure Burn Microstomia

Ari R. Qader* , Kurdo A. Mohmmad**

ABSTRACT:

BACKGROUND:

The reconstruction of the oral commissure microstomia is one of the complex tasks in plastic surgery and the most important issue to be considered is to provide a good functional and acceptable aesthetic result. Various local and regional flaps have been described for this purpose. The vermilion - mucosa flaps are frequently used flaps in reconstruction of small to medium sized microstomia. The reliable blood supply, minimal donor site morbidity and excellent texture and color match are some of the advantages of these flaps.

OBJECTIVE:

This study is to evaluate our results with vermilion-mucosa flaps in the reconstruction of oral commissure.

PATIENT AND METHOD:

This prospective study was done in Sulaimani plastic, reconstructive and burn hospital from April 2008 to September 2009 with minimum follow-ups of 6 months. The total number of patients was fifteen, the age of patient arranged between 1month to 47 years, the flaps designed as vermilion advancement flaps in 7 cases, vermilion-mucosa flaps in 4 cases, and tri -lobes buccal mucosal flaps in 4 cases. The cause of the deformities was , post burn scarring and contracture involving oral commissure, of which twelve cases treated bilaterally, and only three cases treated by unilateral commissuroplasty.

RESULTS:

The flaps were survived and most of the patients were satisfied with the outcome of the operation. Marginal necrosis of one flap was encountered; drooling was encountered in only one patient and it gradually disappeared with time.

CONCLUSION:

The oral vermilion mucosa flaps are reliable tools for reconstruction of small to moderate- sized commissure microstomia. The flaps provide good functional and aesthetic results with reduced necessity for prolonged splinting and secondary procedure and minimal donor site morbidity.

KEYWORDS: microstomia, commissuroplasty.

INTRODUCTION:

Facial burns may be caused by electrical, thermal and chemical agents ^(1,2). Burns lead to tissue damage, devascularization and coagulative necrosis. Healing is associated with scar formation and contracture, which deteriorates the sphincter action of the orbicularis oris muscle ⁽³⁾. The end-result is an undesirable narrowing of oral aperture ⁽⁴⁾, which may interfere with eating, speech, the maintenance of oral hygiene and airway ⁽⁵⁾. The patient may be unable to control drooling and have a displeasing aesthetic appearance. Failure to address facial scare tissue in children can also impair the normal growth of the mandible and teeth, which can lead to bone

deformity and speech problems ⁽¹⁾. Occasionally, vertical excursion is also limited because of scarring of the tissues of the cheeks ⁽⁶⁾.

PATIENTS AND TECHNIQUES:

The total numbers of 15 patients were included in this prospective study that were treated in Sulaimani plastic, reconstructive and burn hospital from April 2008 to September 2009 with minimal follow up of 6 months. With the age group ranging from 1month to 47 years.

General assessment of the patient, and perioral region, particularly the condition of oral commissure, site, size, scar maturity and depth (the anatomical level) of the scar or contracture.

*Department of Surgery, College of Medicine, University of Sulaimani, Kurdistan, Iraq.

**Sulaimani Hospital of Burn, Plastic and Reconstructive Surgery.

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1-Etiology and location, The causes of the deformities in all cases were, post burn scarring and contractures involving oral commissure, The most common causes of the deformity were thermal burn (10 patients, 66.7%), three patient have steam (20%) one patient had electrical (6.7%) and other

patient had scald (6.7%), twelve cases treated bilaterally, only three cases treated by unilateral commissuroplasty **2- Flap designs,** the flaps designed as vermilion advancement flap in 7 cases, vermilion-mucosa flap in 4 cases, tri -lobes buccal mucosal flap in 4 cases(Table1).

Table 1: Types of flaps used

Methods	Patients	Percentage
Vermilion advancement	7	46.6%
Trilobe mucosal advancement	4	26.7%
Vermilion transposition and mucosal advancement	4	26.7%

3- The chief complain, in 8 patients (53.4%) the chief complain were aesthetic (narrowing, asymmetry, scar...), while in 7 patients (46.6%) the problems were functional (difficulty of eating, oral hygiene, speech, and fear of growth disturbance...)

Table 2: Chief complain of patients

Patients with aesthetic problem		Patients with functional problems	
8 (53.4%)		7 (46.6%)	
females	males	females	Males
6 (75%)	2 (25%)	3 (43%)	4 (57%)

Surgical procedure:

Marking:

The patient was marked in the sitting position, in case of unilateral commissure involvement; the distance from the midpoint of the Cupid's bow to the normal contra lateral commissure was used for reference.

While in case of bilateral commissure involvement, the size determined in the relation of the ipsilateral medial limbus of cornea, and the deficient commissure measured by ruler.

The following markings have been done : (see figure1)



(A) Unilateral Microstomia



(B) Horizontal Measure



(C) Vertical Measure



(D) Measure from the cupid bow

Figure 1: Marking of the unilateral new commissure

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Operative Technique:

The general principles of reconstruction are to use local tissue whenever possible, replace vermillion with vermillion, skin for skin, and to avoid any additional scars. Triangle of skin and underlying scar is removed, and contracture released at each

commissure, the mucosa / and or vermillion is then wrapped out or transposed to closed the defect, the closure done by robust sutures (i.e., 3-0 vicryle or 3-0 permanent), and the bite should be large. (Figure 2).



(A) Excision of the scar



(B) Vermillion Advancement



(C) Obtain vertical excess



(D) Postoperative

Figure 3: Commissuroplasty

Post-operative care and follow up:

Topical antibiotic (e.g. garamicin or fucidin) applied to the sutures and left undressed.

Analgesics have been given, fluid and none chewing diet advised in first postoperative day, unless there were concomitant extensive surgical procedures done, the patient is send home with several hours postoperatively. Stitch removal on the fifth to seven days postoperatively. The patients were followed up for the average of one year for assessing the outcome, patient satisfaction, and complications. Instruction on the use of progressive physical exercises (smiling, active mouth opening, stretching of the corners of the mouth with finger pressure).

RESULT:

The patients were followed-up for 18th months postoperatively. After one year, the patients were invited for evaluation of late-term results.

A-commissure function was evaluated as:

Each of the patients was examined clinically assessed and to determined the result his treatment to date. Including in the follow up assessment were general appearance, transverse and vertical measurement, symmetry of the red lip, the degree of webbing and presence of microstomia, the depth of buccal sulci, and dental problems

Oral continence: minimal drooling was present in only one patient who underwent trilobe mucosal

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advancement, but it does not interfere with eating of speech.

The size of the oral aperture and symmetry: It was measured with a ruler that the oral aperture was practically normal. Preoperative mean mouth horizontal opening was (30-40mm), and vertical opening was (<40 mm) and postoperative mean

mouth opening was 23mm and 20mm, respectively. In most of the patients, the new oral commissure of the operated side was within 1 mm medial or lateral to the ideal localization of the commissure which was in this case accepted to be symmetrical (reference point was cupid's bow in unilateral and medial limb in case of bilateral commissuroplasty), (see Table3)

Table 3: Data showing horizontal and vertical access

Vermilion Advancement (mm)							
Patient No.	Horizontal	Vertical	New horizontal	New vertical	Excess horizontal	Excess vertical	Remark
1	20	20	50	55	30	35	Bilateral
2	10	20	35	60	25	40	Bilateral
3	10	20	50	60	40	40	Bilateral
4	10	20	50	60	40	40	Bilateral
5	25	30	50	70	25	40	Unilateral
6	20	20	50	80	30	60	Unilateral
7	15	20	35	50	20	30	Bilateral

Vermillion transposition and mucosal advancement (mm)							
8	50	40	60	50	10	10	Bilateral
9	40	40	60	60	20	20	Bilateral
10	30	30	70	50	40	20	Bilateral
11	35	45	60	60	25	20	Bilateral

Trilobe mucosal advancement (mm)							
12	25	25	40	50	15	25	Bilateral
13	20	20	50	70	30	50	Unilateral
14	20	20	50	70	30	20	Bilateral
15	20	20	50	50	30	30	Bilateral
an excess	35mm	30mm	58mm	52mm	23mm	20mm	

Aesthetic result:

All patients a part of one case were satisfied with the final result, using the 4 grade system (satisfactory, good, fair, and poor).

That unsatisfied patient was due to the developing residual webbing at the side of the repair in one side of the commissure (using Trilobe Mucosal Advancement).

Appearance of commissure: patients underwent Vermilion Advancement have more natural appearance of the red lip with color match and appropriate tapering, compare to those who underwent other two types flaps, no patients found

to have medial or lateral commissure migration of round commissure development

The postoperative complication: One patient developed postoperative partial necrosis which was successfully treated by antibiotic therapy with dressing and secondary intension that did not require revision surgery, one patient developed transit drooling, which become normal after 8weeks, but only one patient was not satisfied due to residual webbing which arranged of secondary surgical revision. Using Trilobe mucosal advancement.

DISCUSSION:

We chose three types of local vermilion-mucosal flaps, based on dozen of articles^(4,5,6), in where these flaps frequently used. In all procedures, the commissure is recreated surgically, thus the raw produced are either covered totally with vermilion or with mucus membrane and partially with vermilion, or totally with mucous membrane⁽⁷⁾.

One of earliest flaps described by Ganzer⁽⁸⁾, Vermilion advancement, the mucosa in the angle of the mouth is sufficiently mobile, it may be possible to remove an epithelial triangle at the appropriate site and advance the entire commissure laterally.

We have utilized this procedure in 7 instances, it is our method of choice, the reason for that, the vermilion portion of the lip has a characteristic bulk, color and form, usually not possess by the tissue used for repair⁽⁹⁾, simply by raising the vermilion flap as a single bipediced flap whose continuity at the corner remains unbroken, repairing defect which reduced the oral stoma by as much as 40%, as it is easy to perform in any age, non-time consuming give better color, texture and consistency than the other 2 procedure.

The Trilobe Mucosa Advancement flap described early by Converse⁽¹⁰⁾ is widely used today, which is composed of complete excision of scar at commissure down to buccal mucosa, a Trilobe flap can then created from the mucosa that is advanced over the defect and sutured in place, we used this method in 4 instances and found it is better to used in sever microstomia otherwise in minor to moderate situation may lead to drooling as it may injure the orbicularis oris, the Aesthetic appearance is not well accepted as above flap due to color mismatch and absent of bulk that normal commissure possess.

A rotational flap was originally described by the Gilles and Millard vermilion⁽¹⁰⁾. From the lower lip is then rotated to cover the defect of the upper lip, a mucosal advancement flap can be us to cover the lower lip defect, we used this flap in 4 instances and we found patient express postoperative pain in ipsilateral commissure more than other methods, beside that, the color discrepancy between upper and lower lip and commissure will be obvious.

Preoperative mean of mouth horizontal and vertical opening was 36mm, 40 mm respectively and postoperative mean mouth opening was 58mm and 52mm, respectively. The mean mouth opening was 23mm and 20mm, respectively. In most of the patients, the new oral commissure of

the operated side was within 1mm medial or lateral to the ideal localization of the commissure⁽¹⁰⁾.

One patient had electrical perioral burn, where we

treated him initially by conservative method allowing spontaneous healing and maturation of the scar, follow by two reconstructive procedures, we did not observe serious hemorrhaging after the injury or at the time of eschar separation and this compatible by other studies⁽¹¹⁾.

Local anesthesia was used for majority of the patients, this is due to fact that in most cases there were difficulties to do intubations, but others were operated under general anesthesia both for difficulties and concomitant other site reconstructions

There are various static and dynamic oral splint that have been advocated by numerous authors^(12,13,14). Splinting may be decrease the extend contracture and degree of microstomia that result, Splinting alone is certainly unable to replace the full thickness loss of segmental lip anatomy that occur in sever

burn⁽⁶⁾, According to the clinical observations of one author (Bardach)⁽¹¹⁾, the use of oral splints for a prolonged period of time may lead to hypertrophic scar formation and does not enhance the reconstructive procedure beside that, many patients do not receive early splinting, and later surgery is required⁽¹⁵⁾

In this study no cases managed by oral splint, due to absent of the tool in the our hospital, instead most of the patient treated by message and chewing gum to enhance softening of the perioral tissue, this is also compatible with other study⁽¹¹⁾.

Generally complications which occurred in our patients were non serious, tip necrosis was encountered in only one patient (6.67%) and was treated successfully by antibiotic therapy, This may be explained by the fact that local mucosal flaps has a good blood supply mainly from labial artery and a rich collateral blood supply of the cheek deriving from masseteric, buccal, infraorbital and transverse facial arteries⁽⁶⁾.

One patient developed transient drooling due to partial injuring of the orbicularis oris lasts 6week to disappear, and one patient developed bilateral residual webbing using Trilobe Mucosal Advancement due to extrinsic contracture of the cheek.

CONCLUSION:

1. Burn involving oral commissure is not only an aesthetic problem but also functional, through majority of patient (8) seek aesthetic reasons and (7) seeks functional as well as aesthetic reconstruction.
2. For achieving a better aesthetic and functional result, if possible, commissuroplasty should be delayed until scar maturation occurred.

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3. In case of severe functional problem it may be necessary to do commissuroplasty regardless of the period of the contracture.
4. Facial symmetry is very important in commissuroplasty surgery, before any surgical procedure, proper planning, precise surgical techniques, and good postoperative follow up are mandatory for optimum result.
5. In our material, some patients were injured between the ages of 1 month and 5 years, which indicate that precautions and education of the parents and children at these ages are necessary to prevent burn injuries.
6. Methods for reconstruction of commissure have demonstrated both functional and cosmetic results, in one particular flap (Vermilion advancement), the method appears to promise, particularly when intact vermilion extends around the border of the defect. The flap achieves an acute angle at a vertical line dropped from the medial limbus of the eye and often requires some overcorrection because the surgical scarring itself may lead to contraction-induced asymmetry. The flap is not at tension; a flap survival has not been a problem, and has same color and texture, can be obtained with vermilion advancement.
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