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Original research

CLINICAL CHARACTERISTICS AND SURGICAL OUTCOMES OF BAD SCAR REVISION AFTER CONGENITAL UNILATERAL CLEFT LIP SURGERY ACCORDING TO MODIFIED MILLARD'S TECHNIQUE

Nguyen Hong Loi[1], Nguyen Van Khanh[1], Tran Xuan Phu[1], Nguyen Dinh Hoa[1], Nguyen Dang Khoa[1]

[1]Odonto - Stomatology Center, Hue Center Hospital

ABSTRACT

Objectives: *To study the clinical characteristics and surgical results of bad scar revision after congenital unilateral cleft lip plastic surgery according to the modified Millard's technique.*

Methods: *A prospective descriptive study with clinical intervention was carried out on 36 patients who had congenital unilateral cleft lip surgery according to Millard's technique with bad scars, deformed lips and nose. They had second - phase surgery to revise these defects at Odonto - Stomatology Center, Hue Central Hospital from April 2021 to April 2023.*

Results: *Bad scar characteristics: Red lips: Keloid accounted for 27.8%; V-shaped notch accounted for 36.1%, one - sided thick lip accounted for 11.1%, one - sided thin lips accounted for 8.3%, lip contour deviation accounted for 69.4%; Lip skin deformity: Too short accounted for 25.0%, Deficiency of orbicularis obis accounted for 36.1%; Incision scars: Good scars accounted for 11.1%, Traction rate 86.1%, Keloid rate 2.8%; Nasal deformity: Too short nose pillar at a rate of 30.6%, Deviated nasal septum 41.7%, wide nostrils 97.2%, Little degree of alar rolling accounted for 47.2%, low alar at 63 .9%, hypoplastic and flat alars accounted for 11.1%. Results of surgery to revise bad scars: Healing results after 7 days: Good 94.4% Hematoma, bruise accounted for 5.6%; Results after 3 - 6 months: Excellent: 72.2% Very Good: 22.2%, Good 2.8%, Acceptable 2.8%.*

Conclusion: *Surgery to revise bad scars and lip - nose deformities by the modified Millard's technique brings good results for patients.*

Keywords: *Unilateral cleft lip, Millard's technique, nasolabial deformity.*

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Corresponding author:
Nguyen Van Khanh
Email:
drkhanhrhm@gmail.com
Phone: 0935884886

I. INTRODUCTION

Cleft lip, a common maxillofacial anomaly, ranks second among birth defects [1, 2]. The only treatment for cleft lip is surgery. Defects that still exist after this first phase of surgery, need to be revised. It is a legitimate and urgent need of patients, and also a heavy responsibility of maxillofacial surgeons. One of the measures to revise the remaining defects is surgery to correct bad scars and lip - nose deformities. And one of the commonly used surgical methods for this is the modified Millard's technique. Therefore, we carried out this study with the goal: Research on the clinical characteristics and surgical results of bad scar revision after congenital unilateral cleft lip surgery according to modified Millard's technique

II. MATERIALS AND METHODS

A prospective descriptive study with clinical intervention was carried out on 36 patients having undergone congenital unilateral cleft lip surgery with the modified Millard's technique, who had bad scars and lip - nose deformities. They had second phase surgery to revise these defects at Odonto - Stomatology Center, Hue Central Hospital from April 2021 to April 2023.

Selection criteria: There are bad scars and lip - nose deformities after the first phase surgery. There is a follow - up examination and follow - up after discharge from the hospital. No systemic diseases, specialized diseases with contraindications to surgery.

Exclusion criteria: Patients with bilateral cleft lip who have undergone first - phase surgery, have corrected bad scars or lip - nose deformities, have severe deformities in the maxilla/ mandible or occlusion. The patient did not show up for the follow - up appointment on time.

Summary of research steps:

- Receiving and classifying patients.
- General and on - site examination.
- Do pre - operative tests, otorhinolaryngology, medical or pediatric examinations.
- Classifying bad scars and lip - nose deformities, choosing surgical methods.
- Surgical revision of bad scars and lip - nose deformities: according to the modified Millard's technique:

+ Millard 2: modified Millard's technique combining back - cut incisions

+ Millard 3: modified Millard's technique combining Tennison triangular flap.

+ Millard 4: modified Millard's technique combining Z-plasty

- Post - operative care and follow-up.
- Evaluating surgical results at the time of discharge (after 7 days).
- Evaluating the results of surgery after 3 - 6 months.
- Evaluation criteria

According to clinical features of bad scars and lip - nose deformities: we based on the classification criteria of Mortier (1997) [3].

Table 1: Mortier Classification [3]

Anatomy details	Evaluation	Points
Postsurgical scar	Good scar	0
	Traction	1
	Keloid	2
Red lips	Keloid	0,5
	V-shaped notch	0,5
	Thick lip on one side	1
	Thin lip on one side	3
	Deviation of lip contour	0,5
Lips	Too short	1
	Too long	1
	Deficiency of orbicularis obis	3
	Narrow Cupid's bow and philtrum	4
	Wide Cupid's bow and philtrum	4
Nose	Too short nose pillar	0,5
	Deviated nasal septum	0,5
	Wide nostrils	0,5
	Narrow nostrils	0,5
	Wide nose pillar base	0,5
	Narrow nose pillar base	0,5
	Low degree of alar rolling	0,5
	High alar degree of rolling	0,5
	Defect in the upper part of the nostrils	0,5
	High nose alars	0,5
	Low nose alars	0,5
	Hypoplastic and flat alars	3

Data processing: The collected data were processed using SPSS 20.0 software.

III. RESULTS

3.1. Bad scar characteristics

Table 2: Postsurgical scars after f irst - phase surgery

Postsurgical scar	Number of patients	Percentage (%)
Good scar	4	11,1
Stretching	31	86,1
Keloid	1	2,8
Total	36	100

The majority of patients with stretching scars (86.1%). Keloid scars with only 1 patient (2.8%).

Table 3: Red lips deformation

Characteristics	Number of patients	Percentage (%)
Keloid	10	27,8
V-shaped notch	13	36,1
Thick lip on one side	4	11,1
Thin lip on one side	3	8,3
Deviation of lip contour	25	69,4

Deviation of lip contour (69.4%) and V-shaped notch (36.1%) are the 2 deformities with the highest number of patients.

Table 4: Lips deformation

Characteristics	Number of patients	Percentage (%)
Too short	9	25,0
Deficiency of orbicularis obis	13	36,1

The categories of "too short lips" (25%) and Deficientcy of orbicularis oris (36,1%) are common.

Table 5: Nasal deformation

Characteristics	Number of patients	Percentage (%)
Too short nose pillar	11	30,6
Deviated nasal septum	15	41,7
Wide nostrils	35	97,2
Low degree of alar rolling	17	47,2
Low nose alars	23	63,9
Hypoplastic and flat alars	4	11,1

The feature of wide nostrils is very common (97.2%), followed by low alar (63.9%) and low degree of alar rolling (47.2%).

3.2. Evaluation the results of bad scars revision

Table 6: Surgery to review bad scars in the repaired area

Anatomy areas	Number of patients	Percentage (%)
Lips (scarring, red lips and skin)	9	25
Nose	0	0
Combined lips and nose	27	75
Total	36	100

The majority of patients received combined lip-nose revision (75%).

Table 7: Surgical techniques to revise bad scars

Surgical technique	Number of patients	Percentage (%)
Millard 2 (*)	12	33,3
Millard 3 (*)	4	11,1
Milard 4 (*)	20	55,6
Total	36	100

The main surgical technique for bad scars revision is Millard 4 (55.6%), following by Millard 2 (33.3%).

Table 8: Surgical techniques to revise bad scars, results after 3 - 6 months

Technique	Results	Acceptable	Good	Very good	Excellent	Total
Millard 2 (*)	Number of patients		1	3	8	12
	Percentage % (n=36) (1)		2,8	8,3	22,2	33,3
	Percentage % (n=12) (2)		8,3	25,0	66,7	100
Millard 3 (*)	Number of patients			1	3	4
	Percentage % (n=36) (1)			2,8	8,3	11,1
	Percentage % (n=4) (2)			25,0	75,0	100
Milard 4 (*)	Number of patients	1		4	15	20
	Percentage % (n=36) (1)	2,8		11,1	41,7	55,6
	Percentage % (n=20) (2)	5,0		20,0	75,0	
Total	Number of patients	1	1	8	26	36
	Percentage % (n=36)	2,8	2,8	22,2	72,2	100

The Millard 4 technique has a fairly high "excellent" result in 15 cases, which accounted for 41.7% of the total 36 patients and accounted for 75.0% of the total 20 patients of this technique.

Table 9: Wound healing after surgery

Wound healing after surgery	Number of patients	Percentage (%)
Good healing	34	94,4
Hematoma, bruise	2	5,6
Suture breakage	0	0,0
Infection	0	0,0
Total	36	100,0

Good healing accounted for the majority (94.4%). None of the patients had blistering or infection.

Table 10: Skin flap condition after surgery (n=36)

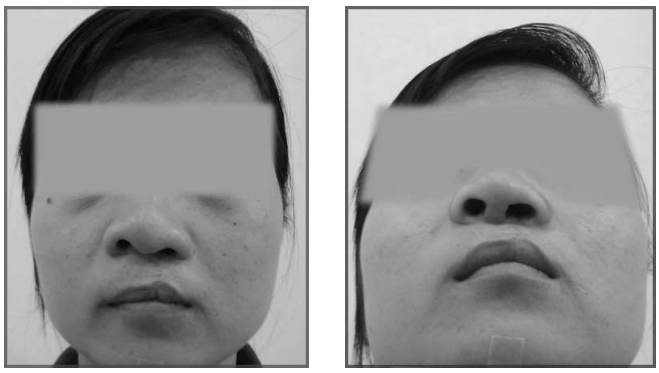
Skin flap condition	Number of patients	Percentage (%)
Skin flaps are well nourished	36	100
Skin flap tail is slightly necrotic	0	0
Necrotic flap of skin	0	0
Total	36	100

Well - nourished skin flaps account for 100%.

Table 11: Evaluate the results of surgery to revise bad scars on the results of the first phase surgery

Results		Bad scar revision surgery (after 3 - 6 months)				First phase total	First phase percentage (%)
		Acceptable	Good	Very good	Excellent		
First phase surgery	Unacceptable			3		3	8,3
	Acceptable	1	1	4	5	11	30,6
	Good			1	4	5	13,9
	Very good				17	17	47,2
Total bad scars revision		1	1	8	26	36	100
Percentage of bad scars revision (%)		2,8	2,8	22,2	72,2	100	
p value		p < 0,05					

Three "Unacceptable" cases of First phase surgery, after surgery to revise bad scars, have been improved to "very good". Eleven "acceptable" cases of First phase surgery, after surgery to correct bad scars: one case remained at "acceptable"; ten cases improved to: "good" (1 case); "very good" (4 cases); "excellent" (5 cases). Five "good" cases of First phase surgery, after surgery to correct bad scars, improved to: "very good" (1 case); "excellent" (4 cases); 17 "very good" cases of First phase surgery, after surgery to correct bad scars, improved to "excellent".



Before surgery After surgery

Figure 1: Bad scar revision after congenital unilateral cleft lip surgery

IV. DISCUSSION

4.1. Bad scar characteristics

Traction scars will tilt Cupid's bow. The cause of bad and stretched scars may be due to the fact that the orbicularis obis is not operated properly. The muscle fibers have not been restored to the correct anatomical position, and with movement, the abnormal muscle bundles will widen the surgical scar. Incorrect surgical technique, traction, and infection are also important factors in reducing the rate of good scars after surgery. When surgery to revise bad scars, the muscle under the scar must be separated from the fibrous scar, the skin attached to the muscle needs to be removed.

About the change of red lips

According to Table 3, when statistics on red lip deformity, we recorded 2 types of deformation with the highest number of patients: V-shaped notch (36.1%) and lip contour deviation (69.4%). V-shaped notch deformation in our research accounted for 36.1%. This result is higher than that of Le Duc Tuan (2004), which is 20.1% [4]. However, this

result is lower than that of: Le Thi Lien (2015): 52.2% [5], Cheema (2014): 66.0% [6]. The cause of this deformity is that the orbicularis obis has not been operated correctly. The connection between the normal lips and the abnormal ones in the red lips is very important. Postoperative infection can also lead to this deformity . These deformities can be overcome by rearranging the red lip to the correct anatomical position through the V-Y sliding flap.

About lip deformation

In our study, Table 4, the percentage of lip skin that is too short or lacks height was recorded as 25%. This result is similar to the results of the study by Rajanikanth (2012), which is 25.00% [2]. But this result is lower than that of: Le Thi Lien (2015): 34.80% [6]. Cheema (2014): 63.00%[6]. Le Duc Tuan (2004): 71,65% [4]. This deformity often occurs after surgery with a straight incision or a push - pull flap (performed incorrectly). The majority of cases were found in patients undergoing surgery by the Millard's technique. According to Millard, it is due to insufficient compensation for the necessary height.

About nose deformity

In Table 5, the nasal deformity that accounted for the largest proportion in our study was the wide nostril (97.2%).

This result is higher than that of: Rajanikanth (2012): 30.0% [2]. Le Thi Lien (2015): 52.2% [5]. Nasal deformities often occur together with lip deformities, and proportional to the severity of cleft lip. The wider the cleft lip, the more disorganization, which will leave many deformities of the lips and nose after surgery. At that time, the NAM appliance should be used before surgery [7]. According to Ritter (2002), a patient with cleft lip and palate must undergo 3 - 12 surgeries (mean 6) to correct the deformity [8].

4.2. The results of scars revision surgery

Repaired area

In Table 6, we have recorded that 75% of patients received combined lip - nose repair, this result is higher than the study's result of Le Thi Lien (2015), which is 65.2% [5]. In our opinion, this is due to the first stage surgery that left a large proportion of lip - nose deformities. At the same time, most patients also have needs and requests to revise both lips and nose. The repair area depends on the needs of the patient and family, but also depends on the judgment of the surgeon.

About the surgical technique to fix bad scars

In 36 patients who received lip surgery to revise bad scars, according to Table 8, we found that the number of patients who were operated by: Millard's technique combined with back - cut incision was 12, accounting for 33.3%. The Millard's technique combined Z plasty was 20, with a corresponding rate of 55.6%. This shows the popularity of the Millard's technique combined with Z plasty in surgical revision of deformities. However, in our opinion, another cause is: The fairly wide indication of this technique, such as removal of bad scars, redirecting scars into natural wrinkles, revising lips that lack height (This is a common deformity in patients with unilateral cleft lip, and was first reconstructed by the triangular rotation flap method.) when the orbicularis obis has been well managed. Another common deformity is the disproportionate deviation between the skin and the mucosa (which is caused by incorrect cutting and suturing), in these cases the Z plasty is a good solution. With whistling-type deformity, some surgeons advocate using a rotation flap or Z-plasty flap, or a muscle-mucosa flap with peduncle to operate it, in order to compensate for the defect.

Wound healing after surgery to revise bad scars 7 days

According to Table 9, good healing rate was 94.4%. We believe that such a good result is due to the good implementation of the following steps with a high sense of responsibility: Patient examination; Evaluation of medical condition; How to choose a surgical method; How to perform surgery; Postoperative care. Although there were 2 cases of bleeding in the surgical area, the bruises were not much, and healed after 1 week. The authors Le Duc Tuan [4], Le Thi Lien [5].

Condition of the skin flaps

According to Table 10, the percentage of well - nourished skin flaps accounted for 100%, there were no cases of flap necrosis. The reason, in our opinion,

is that: Bad scar repair surgery using the modified Millard's technique, the C flap tail inside the cleft does not extend to the highest point of the Cupid's bow like the classic Millard's technique, but located higher, so the flap will be shorter, the peduncle is wider, ensuring the flap is better nourished. The surgical process is carried out carefully, with little damage, careful hemostasis, and no hematoma. Good wound care and infection prevention are also important factors in helping the flap to be healed. well nourished.

Results of scar revision surgery after 3 - 6 months

According to Table 11, "excellent" results after surgery to correct bad scars and lip - nose deformities in our study accounted for 72.2%. This is a pretty high percentage. Although 35/36 cases had better scar revision surgery results than that of the first phase (statistically significant), there was still 1 case with the same results of "acceptable" (2.8%). The reason is because, in this case, the total nose score is 5, the total lip - nose score is 7,5. However, the patient was only allowed to revise his lips at the request of his family. Therefore, after surgery to correct bad scars, the total nose score did not improve (still 5), although the total lip - nose score decreased, only 6, but according to the Mortier classification [3], this patient still stood at "acceptable". There were 4/13 cases of bad scarring of the cleft lip with a cleft dental arch, cleft palate which were repaired with cartilage grafts. These cases all gave positive results, nose height, the height of the nostril on the same side with the cleft is increased, the nasal width, the nostril width on the cleft side is narrowed. Cases of nose deformity are often undergone surgery with open rhinoplasty, fixed hanging stitches.

V. CONCLUSION

Early plastic surgery, should combine lip - nose plastic surgery at the same time, in order to reduce post - surgical deformities, relieve some guilt for the patient. Surgery to correct bad scars and lip - nose deformities by Millard's technique brings good results to patients.

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