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ORIGINAL RESEARCH ARTICLE

A Comparative Study of Complete Unilateral Cleft Lip Repair by Millard's Rotation Advancement Procedure and Triangular Flap Repair of Tennison

[1]Dr. Rojalin Mishra, [2]Dr. Rasmi Ranjan Mohanty, [3]Dr. Bibhuti Bhusan Nayak

[1]Senior Resident, [3]Professor & HOD, Department of Plastic Surgery, SCB Medical College, Cuttack, Odisha, India
[2]Assistant Professor, Department of Plastic Surgery, MKCG Medical College, Berhampur, Odisha, India

Corresponding Author: Dr. Rasmi Ranjan Mohanty
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ABSTRACT

Cleft lip is one of the most common congenital defects found in infants. Historically many techniques have been used for Cleft lip repair of which Modified Millard's rotation advancement technique and Randall & Tennison's triangular flap technique are most commonly used.

Aims and objectives: This study was done to evaluate and compare the surgical outcomes of primary repair of Complete Unilateral Cleft lip by Millard's rotation advancement technique and Randall-Tennison's Triangular flap technique in terms of Quantitative and qualitative assessments like cupid bow pouting, vermilion symmetry, nasal floor alar base symmetry and scar appearance was analysed by 5 different Plastic surgeons.

Materials and Methods: 40 patients of complete Unilateral Cleft Lipoperated using either Millard's technique or Randall-Tennison's Triangular flap technique(20 each)in the Department of Burns, Plasticand Reconstructive Surgery, SCB Medical College and Hospital, Cuttack for 2 years. They were compared with 20 normal patients (control).

Results: Overall mean age was 5.07 ± 1.41 months and1st birth order comprised of 45.0%. Family history was found among 6.7% cases. 78.3% patients were in age group 3 – 6 month, 21.7% in 6 -12 months age group. Postoperatively there was significant difference in total nasal width between Tennison and control, Millard and Tennison but insignificant between Millard and Control.

Conclusion: There was no statistical difference between Modified Millard's rotation advancement technique and Randall-Tennison's Triangular flap technique for the primary repair of the unilateral cleft lip under the hands of a qualified and skilled Plastic Surgeon.

Key words: Cleft lip, Millard's repair, Randall- Tennison's repair.

INTRODUCTION

Cleft lip is among the commonest congenital facial defects in infants and ck=left surgery is one of the commonly done surgeries in a Plastic Surgery unit in any hospital. Historically many techniques have been used for Cleft lip repair.

Till date no single technique for unilateral cleft lip repair can claim to produce ideal aesthetic and functional results consistently. Presently, Modified Millard's rotation advancement technique and Randall & Tennison's (TR) triangular flap technique are two of the most commonly used techniques for cleft lip repair.

The ideal repair for cleft lip should result in symmetrical upper lip with equivalent philtral

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column bilaterally and the resultant scar not transgressing the opposite side, no picking at cupid bow or vermilion notching.

AIMS & OBJECTIVES

This is a comparative study of complete unilateral cleft lip repair by Millard's technique and Tennison's triangular flap technique

MATERIALS &METHODS

The patients for the present study comprised of 40 patients of complete Unilateral Cleft Lip who were admitted and operated in the Department of Burns, Plastic and Reconstructive Surgery, SCB Medical College and Hospital, Cuttack from December 2018 to December 2020. The study was approved by the research and ethical committee of Utkal University. Written informed consent was obtained from parents/guardians of subjects before study enrollment. They were operated during the study period using either Millard's technique or Randall-Tennison's Triangular flap technique so that 20 cases were operated using each technique. The following data were recorded preoperatively on a proforma: age, sex, cleft side, birth order and family history.

Inclusion Criteria

- Unilateral complete Cleft Lip.(UCL)
- Between 3 months to 2 years of age.
- No contraindications for General Anesthesia.

Exclusion Criteria

- Associated cardiac anomalies
- Unilateral incomplete cleft lip.
- Below 3 months and above 2 years.
- Malnutrition, Anemia, or other conditions contraindicating for General Anesthesia.

Routine preoperative blood investigations were done. Subjects were referred to pediatrician for clinical evaluation. Preoperative photographs were taken for all subjects.

Surgical repair was done under general anesthesia. Postoperatively, the subjects were reviewed weekly for two weeks, and then once every month for three months; the surgical-outcome evaluation was performed at the 3rd month of follow-up.

Evaluation of surgical outcome

Quantitative assessments were performed on anthropometric measurements, as described by Cutting and Dayan. Anthropometric measurements were recorded from a 2-D full-frontal facial photograph of subjects taken with a digital camera (Cannon power shot A2300; 35mm focal length; 180 dpi resolution). For standardization, each photograph was taken with the camera positioned 50 cm from the subject, and all the images were of height 36.7 cm, width 38.31 cm, resolution 180 pixels/inch; 2715 x 2601 pixels. The photographs were then imported into Adobe Photoshop 7.0 software(CC software for analysis). (Figure-1)

Various preoperative and postoperative anthropometric measurements were taken. (Figure-2&3)

Qualitative assessment was done comparing symmetry of vermilion border, alar base and nostril floor symmetry and scar appearance. Each parameter was graded as Good/Average/Poor

Control subjects

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Aged matched control subjects (20) were recruited from the outpatient department of pediatrics department of SCB Medical College and Hospital.
Vertical lip height, horizontal lip length, nasal width, total nasal width, philtral height, and Cupid's-bow width were measured as defined above.
All the qualitative parameters like cupid bow pouting, vermilion symmetry, Nasal floor alar base symmetry and scar appearance was analysed by 5 different plastic surgeons.
The parameters were compared individually between the two techniques. The data was analysed and compared using statistical methods.

Statistical methods
The statistical software IBM SPSS for Windows Version 24.0 was used for the analysis of the data. Microsoft Word and Microsoft Excel have been used to generate graphs, tables, etc.

RESULTS
There are 20 patients each in Millard, Tennison and Control group out of which 56.7% were males and 43.3% are females. The majority of the cleft are in the left side. No significant association existed between right & left. (p=0.931).The family history of cleft was only found among 6.7% cases which was statistically insignificant. (p=0.765) The 1st birth order comprised of 45.0%, 2nd 46.7% and 3rd birth order constituted only 8.3%. In all the groups, the order of birth did not differ significantly (p= 0.775).There are 78.3% in age group 3 – 6 month, 21.7% in 6 -12 months age group. Overall mean age is 5.07 ± 1.41 months. (Table-1)
The mean preoperative values of horizontal lip length, vertical lip height on the cleft side were lower and nasal width is higher than those of the non-cleft side and the controls. Postoperatively, there was a significant increase in horizontal lip length and vertical lip height, as well as a significant decrease in nasal width in both surgical groups when compared with the preoperative measurements.
In the Millard group, there is significant difference between preoperative and postoperative vertical lip height on non-cleft (p=0.010) and cleft side (p=0.004). There is also significant increase in horizontal lip length on cleft side (p=0.005).Difference between preoperative & postoperative horizontal lip length on non-cleft side (p=0.811) &total nasal width (p=0.683) did not differ significantly; though postoperative nasal width on cleft side & total nasal width decrease comparing with pre-operatively but it is not significant. (Table-2)
In the Tennison group, preoperative & postoperative nasal length in the cleft side (p=0.005) and nasal width non-cleft side (p= 0.034) did show significant difference. There is increase in post op nasal width in Non-cleft side and decrease in nasal width in cleft side. However there is no significant difference between preoperative and postoperative total nasal width (p= 0.471). (Table-3)
There is no significant difference between preoperative and postoperative vertical lip height on non-cleft side, vertical lip height on cleft side, horizontal lip length on non-cleft side and horizontal lip length on cleft side (p> 0.05).
The postoperative vertical lip height between cleft and non-cleft side in Millard repair was 17.9 – 15.8 mm = 2.1 mm. and found significant (p=0.000).Similarly the mean difference between postoperative horizontal lip length on non-cleft side and cleft side was 2.5 mm. and found significant (p= 0.000). However the mean difference between postoperative nasal width on non-cleft and cleft side was 0.2 mm. and found non-significant (p=0.066). (Table-4 & Figure-4)
The postoperative vertical lip height between cleft and non-cleft side in Tennison repair did not differ significantly (p=0.089) but horizontal lip length did have a significance difference (p=0.000). Postop nasal width on non-cleft and cleft side did not differ significantly (p=0.394). (Table-5& Figure-5)

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The difference among the mean post-operative vertical lip height on cleft side of Millard, Tennison and control were significant (p= 0.001) and Tennison and Control group was significant (p= 0.001) but between Millard and control was insignificant (p= 0.138). (Figure-6) Mean postoperative horizontal lip length on cleft side did not have significant difference among Millard, Tennison and Control group (p= 0.356). Mean postoperative nasal width on cleft side differ significantly between Millard and Tennison (p=0.000). Postoperative total nasal width significantly differ among Millard, Tennison and control group (p=0.000). The difference was significant between Tennison and control (0.000), Millard and Tennison (p=0.001) but insignificant between Millard and Control (p= 0.071). (Table-6)

In the Millard group the comparison of mean Philtral column height cleft side and non-cleft side in the Millard group (p=0.651) and within Tennison group (p=0.11) did not differ significantly (p=0.651). (Table-7)

The mean Philtral column height in the non-cleft side differ significantly among Millard, Tennison and control group (p= 0.000). There is significant difference in the mean Philtral column height between Milland and Tennison groups (p=0.042), Millard and Control (p= 0.004) but no significance difference between Tennison and control (p= 1.000). The mean Philtral column height cleft side did not differ significantly between Tennison and Millard groups (p=0.350).

The mean Cupids Bow length among Millard, Tennison and control groups differ significantly (p=0.000).The difference is significant between Millard and Tennison (p =0.001), Millard and Control (p=0.002), but no significant difference between Tennison and Control (p=1.000). (Table-8)

There is no significant difference in the Symmetry of vermilion border (p= 0. 803) and scar appearance (p= 0.806)between the two groups. (Table-9)

There is no significant difference in the Pouting of Cupid Bow and Symmetry of alar base between the two groups (p= 0. 589, 0.806 respectively).(Table-10)

Gender	**Surgery**						**Total (N=60)**		**p' value**
	Millard (N=20)		**Tennison (N=20)**		**Control (N=20)**				
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
Male	9	45	13	65	12	60	34	56.7	0.414*
Female	11	55	7	35	8	40	26	43.3	
Side									
Right	7	35	8	40			15	37.5	0.931*
Left	13	65	12	60			25	62.5	
Birth Order									
First order	11	55	7	35	9	45	27	45	0.775*
Second order	8	40	11	55	9	45	28	46.7	
Third order	1	5	2	10	2	10	5	8.3	
Risk Factor									
None	20	100	20	100	20	100	60	100	
Family History									
Nil	18	90	19	95	19	95	56	93.3	0.765*
Positive	2	10	1	5	1	5	4	6.7	
3 -6	19 (95.0 %)		13 (65.0%)		15 (75%)		47 (78.3%)		0.064*
>6 -12	1 (5.0 %)		7 (35.0%)		5 (0%)		13 (21.7%)		
>12 – 24	0 (0.0 %)		0 (0.0%)		0 (0%)		0 (0%)		
Age in month#	4.70 ± 1.03		5.25 ± 1.68		5.25 ± 1.45		5.07 ± 1.41		0.370$

Table 1 Demographic profile by surgery

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Mean ± SD, * Chi-square test 'p' value, $ ANOVA 'p' value

Pair of comparison	Millard			Paired sample 'p' value
	N	Mean	SD	
Preop-veticcal lip height on non cleft side (in mm)	20	14.1	2.3	0.010
Postop vertical lip height on non cleft side (in mm)	20	17.9	3.0	
Preop vertical lip height on cleft side(in mm)	20	10.8	3.0	0.004
Postop vertical lip height on cleft side (in mm)	20	15.8	4.2	
Preop Horizontal lip length on non cleft side (in mm)	20	24.2	2.8	0.811
Postop horizontal lip length on non cleft side (in mm)	20	25.9	4.8	
Preop Horizontal lip length on cleft side (in mm)	20	20.9	3.8	0.005
Postop horizontal lip length on cleft side (in mm)	20	23.4	5.7	
Preop nasal width cleft side	20	18.0	2.1	0.395
Postop nasal width cleft side	20	12.9	2.6	
Preop nasal width non-cleft side	20	10.8	2.9	0.227
Postop nasal width non-cleft side	20	13.0	2.6	
Preop total nasal width (in mm)	20	28.4	2.9	0.683
Postop total nasal Width (in mm)	20	26.3	4.3	

Table 2: Comparison of preoperative and postoperative parameters between cleft and non-cleft side: Millard

Pair of comparison	Tennison			Paired sample 'p' value
	N	Mean	SD	
Preopveticcal lip height on non cleft side (in mm)	20	15.2	2.0	0.841
Postop vertical lip height on non cleft side (in mm)	20	19.8	3.4	
Preop vertical lip height on cleft side(in mm)	20	11.3	1.9	0.570
Postop vertical lip height on cleft side (in mm)	20	17.6	3.1	
Preop Horizontal lip length on non cleft side (in mm)	20	20.4	4.2	0.545
Postop horizontal lip length on non cleft side (in mm)	20	22.8	5.1	
Preop Horizontal lip length on cleft side (in mm)	20	19.0	4.2	0.460
Postop horizontal lip length on cleft side (in mm)	20	22.4	5.3	
Preop nasal width cleft side	20	20.1	3.9	0.005
Postop nasal width cleft side	20	17.3	2.9	
Preop nasal width non-cleft side	20	11.5	2.8	0.034
Postop nasal width non-cleft side	20	13.1	2.9	
Preop total nasal width (in mm)	20	31.6	3.3	0.471

Table 3: Comparison of pre and post lip height, lip length and width between cleft and non-cleft side: Tennison

Pair of comparison	Millard			Paired sample 'p' value
	N	Mean	SD	
Postop vertical lip height on non cleft side (in mm)	20	17.9	3.0	0.000
Postop vertical lip height on cleft side (in mm)	20	15.8	4.2	
Postop horizontal lip length on non cleft side (in mm)	20	25.9	4.8	0.000
Postop horizontal lip length on cleft side (in mm)	20	23.4	5.7	
Postop nasal width on non cleft side (in mm)	20	13.1	2.4	0.066
Postop nasal width on cleft side (in mm)	20	12.9	2.6	

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Table 4: Comparison of pre and post lip height, lip length and width between cleft and non-cleft side: Millard

Pair of comparison	Tennison			Paired sample 'p' value
	N	Mean	SD	
Postop vertical lip height on non cleft side (in mm)	20	19.8	3.4	0.089
Postop vertical lip height on cleft side (in mm)	20	17.6	3.1	
Postop horizontal lip length on non cleft side (in mm)	20	22.8	5.1	0.000
Postop horizontal lip length on cleft side (in mm)	20	22.4	5.3	
Postop nasal width on non cleft side (in mm)	20	13.1	2.3	0.394
Postop nasal width on cleft side (in mm)	20	17.3	2.3	

Table 5: Comparison of pre and post lip height, lip length and width between cleft and non-cleft side: Tennison

Variable	Surgery Type	Mean	Std. Deviation	ANOVA 'p' Value
Postop vertical lip height on cleft side (in mm)	Millard	15.8	4.2	0.001
	Tennison	17.6	3.1	
	Control	13.8	1.7	
	Total	15.8	3.5	
Bonferoni p Millard Vrs. Tennision 0.241, Millard Vrs Control 0.138, Tennission Vrs. Control 0.001				
Postop horizontal lip length on cleft side (in mm)	Millard	23.4	5.7	0.356
	Tennison	22.4	5.3	
	Control	21.3	1.6	
	Total	22.4	4.6	
Bonferoni p Millard Vrs. Tennision 1.000, Millard Vrs Control 0.457, Tennission Vrs Control 1.0				
Postop nasal width on cleft side (in mm)	Millard	12.9	2.6	0.000
	Tennison	17.3	2.3	
	Total	15.1	3.3	
Postoperative total Nasal Width (in mm)	Millard	26.3	4.3	0.000
	Tennison	30.4	2.9	
	Control	23.8	2.4	
	Total	26.8	4.3	
Bonferoni p Millard Vrs. Tennision 0.001, Millard Vrs. Control 0.071, TennissionVrs. Control 0.000				

Table 6: Comparison of postoperative vertical lip height, horizontal lip length, nasal width on cleft side and total nasal width by surgery type

Types of Surgery	Variable	Mean	Std. Deviation	p value
Millard	Philtral column height cleft side(in mm)	12.9	3.1	0.651
	Philtra column height non cleft side(in mm)	12.6	2.5	
Tennison	Philtral column height cleft side(in mm)	13.8	2.6	0.223
	Philtra column height non cleft side(in mm)	13.1	3.2	

Table 7: Pairwise comparison of Philtral column height by types of surgery

Variable	Types of Surgery	N	Mean	Std. Deviation	ANOVA p value

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Philtra column height non cleft side(in mm)	Millard	20	12.63	2.46	0.000
	Tennison	20	10.07	3.17	
	Control	20	10.13	0.36	
	Total	60	11.18	2.59	
	ANOVA p value Millard vrs. Tennison 'p' =0.042, Millard vrs. Control p=0.004, Tennison vrs. Control p=1.000				
Philtral column height cleft side(in mm)	Millard	20	12.90	3.07	0.350
	Tennison	20	13.75	2.59	
	Total	40	13.33	2.84	
Cupids Bow length(in mm)	Millard	20	12.09	1.95	0.000
	Tennison	20	10.10	1.92	
	Control	20	10.21	0.66	
	Total	60	10.80	1.84	
	ANOVA p value Millard vrs. Tennison 'p' =0.001, Millard vrs. Control 'p'=0.002, Tennison vrs. Control 'p'=1.000				

Table 8: Comparison of Philtra column height and Cupids Bow length by types of Surgery

Attributes		**Surgery**						
		Millard		**Tennison**		**Total**		**Chi Square test p value**
		No	**%**	**No**	**%**	**No**	**%**	
Symmetry of vermilion border	Good	8	40.0	6	30.0	14	35.0	p =0. 803
	Average	6	30.0	7	35.0	13	32.5	
	Poor	6	30.0	7	35.0	13	32.5	
	Total	20	100.0	20	100.0	40	100.0	
Scar appearance	Good	10	50.0	8	40.0	18	45.0	
	Average	7	35.0	8	40.0	15	37.5	p= 0.806
	Poor	3	15.0	4	20.0	7	17.5	
	Total	20	100.0	20	100.0	40	100.0	

Table 9: Comparison of Symmetry and Scar appearance

Variable		**Surgery**					
		Millard		**Tennison**		**Total**	
		No.	**%**	**No.**	**%**	**No.**	**%**
Pouting of Cupid Bow	Good	7	35.0	10	50.0	17	42.5
	Average	10	50.0	7	35.0	17	42.5
	Poor	3	15.0	3	15.0	6	15.0
	Total	20	100.0	20	100.0	40	100.0
	Chi-square ‘p’	0.589					
Symmetry of alar base and nostril floors	Good	9	45.0	11	55.0	20	50.0
	Average	8	40.0	5	25.0	13	32.5
	Poor	3	15.0	4	20.0	7	17.5
	Total	20	100.0	20	100.0	40	100.0
	Chi-square ‘p’	0.596					

Table 10: Comparison of Pouting of Cupid Bow and Symmetry of alar base and nostril floors

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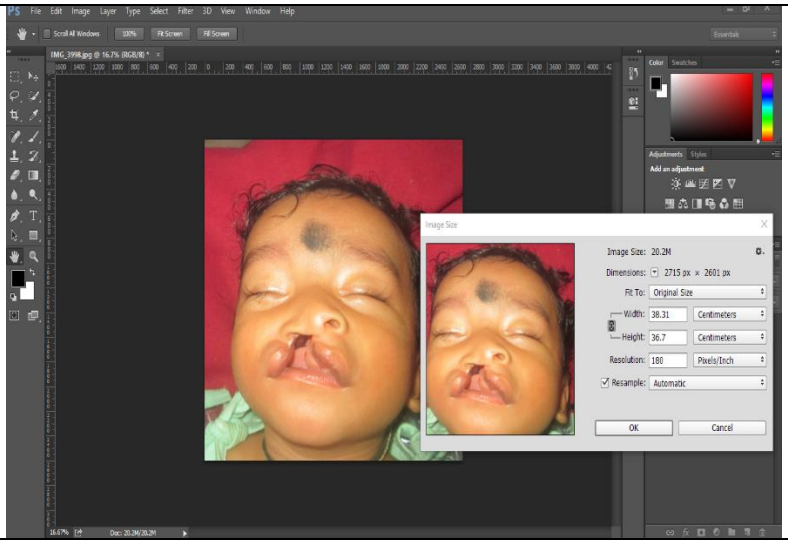

Figure 1: The photograph imported into Adobe Photoshop 7.0 software (CC software for analysis)

Figure 2: Preoperative anthropometry reference points

① Vertical lip height on non-cleft side: measured from the ala base to the peak of Cupid's bow on the same side.
② Vertical lip height on cleft side: measured from the ala base on the cleft side to a point where the white roll begins to disappear.
③ Horizontal lip length on non-cleft side: measured from peak of Cupid's bow on the non-cleft side to the ipsilateral commissure of the mouth.
④ Horizontal lip length on cleft side: measured from where the white roll starts to fade out to the ipsilateral commissure.
⑤ Nasal width: measured from ala base to the midpoint of the columella for both sides.
⑥ Total nasal width: measured from the ala base on the cleft side to the ala base on the non-cleft side.

Fig 2: (Point 1: alar base, cleft side, Point 2: alar base, non-cleft side, Point 3: midpoint of the columella, Point 4: peak of Cupid's bow, cleft side [where the white roll begins to disappear], Point 5: peak of Cupid's bow, non-cleft side, Point 6: corresponding peak of Cupid's bow, cleft side, Point 7: commissure, cleft side, Point 8: commissure, non-cleft side, Point 2 to 5: vertical lip height, non-cleft side, Point 1 to 4: vertical lip height, cleft side, Point 5 to 8: horizontal lip length, non-cleft side, Point 4 to 7: horizontal lip length, cleft side, Point 2 to 3: nasal width, non-cleft side, Point 1 to 3: nasal width, cleft side, Point 1 to 2: total nasal width).

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Figure 3: Postoperative anthropometry reference points

① Vertical lip height: measured from the ala base to the peak of Cupid's bow, for both the cleft and non-cleft sides.
② Horizontal lip length: measured from the peak of Cupid's bow to the commissure for both the cleft and non-cleft sides.
③ Nasal width: measured from the ala base to the midpoint of the columella for both the cleft and non-cleft sides.
④ Total nasal width: measured from the ala base on the cleft side to the ala base on the non-cleft side.
⑤ Philtral height: measured from the peak of Cupid's bow to the midpoint of the columella for both the cleft and noncleft sides.
⑥ Cupid's-bow width: measured from the peak of Cupid's bow on one side to the peak on the other side.

Fig 3: (Point 1 to 3: nasal width, cleft side, Point 2 to 3: nasal width, non-cleft side, Point 4 to 5: Cupid's-bow width, Point 1 to 4: vertical lip height, cleft side, Point 2 to 5: vertical lip height, non-cleft side, Point 5 to 8: horizontal lip length, non-cleft side, Point 4 to 7: horizontal lip length, cleft side, Point 3 to 4: philtral height, cleft side, Point 3 to 5: philtral height, non-cleft side)

Figure 4(a) & (b): Pre-operative & post-operative figure shows good outcome after Millard II technique

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Figure 5(a) & (b): Pre operative & post-operative figure shows good outcome after Tennisons technique.

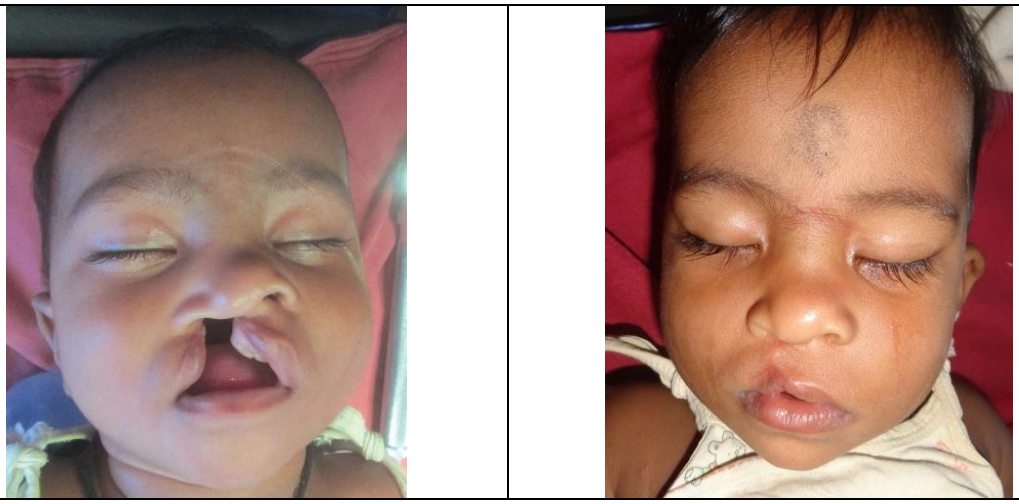

Figure 6(a) & (b): Pre operative & post-operative figure shows average outcome after Millard II technique

Figure 7(a) & (b): Pre operative & post-operative figure shows good outcome after Tennisons technique

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Figure 8(a) & (b): Pre operative & post-operative figure shows poor outcome after Millard II technique

Figure 9(a) & (b): Pre operative & post-operative figure shows average outcome after Tennisons technique

DISCUSSION

To optimize outcomes and avoid suboptimal treatment, repair techniques should be according to best available research data.[1-9]We evaluated cleft repair outcomes three months postoperatively. Our research was guided by the report that healing would be well advanced by the 3rd month.[10]Remodelling of collagen fibers begin in this phase providing optimal strength to the repaired tissues and the residual scaras described by Clark in 1996. Abdurrazaq et al[11]and Amaratunga[12] did a three month post -operative evaluation in older patients reporting similar outcomes.

We found male predominance in Unilateral Cleft Lip as found in other studies also. Left sided Cleft laterality was much more common than the right; a finding similar to those of other performed studies.[13-16]

The best methods to evaluate repaired cleft lip and nose morphology[17]are clinical examination and antropometry, asitquantitatively analyses the degree of deformity. Most of the existing studies evaluate lip morphology symmetry postoperatively among UCL patients. However we recorded pre- and postoperative anthropometric lip and nose measurements and qualitative assessment for all our complete patients. Preoperatively, horizontal lip length, vertical lip height, and nostril width on the cleft side were compared with those on the non-

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cleft side, and then among those of the controls. Our results showed that horizontal lip length and vertical lip height were shorter, and nostril width was wider in on the cleft sides than on the non-cleft sides, and compared with those of the control. This is consistent with findings by Chou et al.[18] that suggest that UCL patients have a lip tissue hypoplasia on the cleft side. Also, it has been suggested that cleft deformity reflects not only the varying extent of embryological failure, but is also the ultimate result of growth and development impairment.[19] Postoperative measurements of horizontal lip length, nostril width, vertical lip height, and philtral height on the cleft side showed marked improvements when compared to that of the non-cleft side. Furthermore, our study demonstrates that repairs by both the Tennison Randall and Millard techniques were effective. Our findings are consistent with those of Bilwatsch et al.[20] and Hakim et al.[21], who independently evaluated Millard's and Tennison Randall techniques, respectively. Hakim et al.[21] performed postoperative digital anthropometry on 18 patients who received UCL repairs with rotation-advancement and they compared these to normal controls. Symmetry of the cleft side with the control but not with the non-cleft side has been reported in other studies.[21,22] Cupid's bow in a case of repaired UCLs is wider than in normal controls,[23,24] but in our study philtral column height & Cupids bowin the TR group was more similar to those of the controls than the Millard group.(Figure-7&8) In our study, Cupid's bow was preserved by TR technique by lowering the peak in cleft margin complying with findings of Bilwatsch et al[20] and contrasting with findings of Sameh et al,[25] who concluded that the TR technique was less effective than Millard technique in preserving Cupids bow. Postoperative vertical lip height in the Millard group was better than that of Tennison group when compared with the control, Mean postoperative horizontal lip length on cleft side did not have significant difference among Millard, Tennison and Control group.Millard's technique resulted in a greater total nasal width as compared to controls when compared to the non-cleft side while the post-operative vertical lip height on cleft side was better in Tennison group.(Figure-9)

Overall no statistically significant difference was observed between the two techniques in all the four postoperative parameters to judge the appearance of the lip and nose. Similar results were obtained by Chowdri NA, et al in their randomized comparative study conducted over a period of 6 years in Kashmir, India.[26] In a similar comparative study by Lazarus et al[27]in Cape Town, South Africa, following unilateral cleft lip repair, outcomes was similar except in complete cleft lips which were repaired by the rotation-advancement technique resulting in a cosmetically deficient short lip on the repaired side. Two parameters namelynostril floor& alar base symmetry and Slight pout of the central upper lip had majority (>50%) Good outcomes in Tennisontechnique. The other Two parameters namely Symmetry of vermilion border and scar apperance had majority (>40%) of GOOD outcome in Millard technique. Our study revealed comparable results in terms of symmetry of nostrils. This was unlike in a similar study conducted by Yamada T, *et al* who reported a better shape of the nose and nostril in the Rotation Advancement Group (modified Millard'stechnique).[28]In a retrospective comparative study by Li A et al in China,[29]the nasal deformities were improved in the rotation advancement group, but this method tend to result in a small nostril. On the other hand, the nasal defects were little improved in triangular flap group, whereas there was much less tendency to result in a small nostril. However in our study similar results were obtained with either technique. This can be attributed to objective grading, short period of study and lack of long termfollow-up. Aymmetry of secondary nasal skin envelope was studied by Cutting CB, Bardach J and Richard P[30] indicating similar vertical symmetry of nasal skin envelope in both groups.

Depression of alar dome, short columella and hooding of the nostril apex were observed on the cleft side. The two repairs differed significantly in the parameter of "horizontal dimension of the nasal skin envelope". Millard I repair resulted in a more normal alar base, while the

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triangular displaced the alar base more laterally. In our study, alar base and nostril floor were similar in both the techniques.

CONCLUSION

- Male predominance is seen in Unilateral Cleft Lip.
- Right-sided Cleft Lip is less common than left side.
- No significant difference exists between Modified Millard's rotation advancement technique and Randall-Tennison's Triangular flap technique for the primary repair of unilateral cleft lip if performed by aqualified and skilled Plastic Surgeon.
- Thus, either technique can be employed for unilateral cleft lip repairs, taking into account the pros and cons of each technique. And, whichever repair is used, the end result is a function of individual preference, surgeon skill level, and the extent of cleft deformity.

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