Guardian & Surgeon Satisfaction After A Recently Developing Modified Millard Technique for Primary Lip Repair (Case Series Study)

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Abstract

Background: Orofacial cleft is an exciting field for research. Hundreds of daily cleft lip operations worldwide are targeting the quality of either parent's or Professional health care providers' satisfaction.

Objective: This is a Case series study to assess both guardians' and surgeon's satisfaction regarding one of the developing modified Millard techniques known as (Mishra) flap Introduced by an Indian Plastic surgeon in 2015

Patients and Methods: 20 infants with complete unilateral cleft lip were enrolled in our study, primary cheiloplasty by Mishra technique, keeping the white roll continuity. The Guardian continuously contacted for evaluation of esthetic outcomes obtained within a time frame (1 month and 3 months postoperatively. On the other hand, a professional assessment was obtained with two separate Consultants at the same mentioned time frame.

Results: there was a significant increase in guardians' satisfaction regarding residual scar visibility and maturation at 3 months compared with 1 month postoperatively.

And regarding the professional assessment of philtrum column length was quite symmetrical with the contralateral un-clefted side at 3 months compared with 1 month postoperatively.

Conclusion: The WRV Flap modification is a reliable modification for unilateral cleft lip repair, with very reasonable esthetic outcomes especially such as scar maturation and philtrum column length symmetry.

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Introduction

Various techniques of unilateral Cleft lip repair characterize the surgeon's long quest for the ideal surgery. Millard introduced the rotational advancement method in 1958 and he refined his protocol in 1976.

Since then, many modifications to his rotation progression method have been published. These modifications attempted to correct perceived deficiencies such as poor vermilion fullness, philtrum esthetics, white roll disruption, and scar shrinkage.

Many prototypes and modifications published attempted to introduce subtle changes, especially to classic or modified mirrored skin cuts. The constant evolution of numerous surgical techniques is only a struggle to combine reconstructive principles to restore both form and function. However, the overall goal is to ensure normal facial growth and near-normal facial beauty and reduce the risk of further revision surgery.

Over the past 20 years, Millard and modified rotation and advanced techniques have been reported to be the most common primary lip surgical repair worldwide for unilateral complete cleft lip. However, this protocol had certain limitations. The midline scar continued, the contraction of the scar pulling up the white roll, somehow distorting Cupid's bow, sometimes turning it into a hypoplastic vermilion inside. In 2015 R.K. Mishra et al published a new revision based on the main concept of White Rolled Vermilion (WRV) flap surgery. The outer lip segment is used to build the vermilion and white rolls on the inner lip segment. One of the most important outcome variables in any plastic surgery procedure is patient satisfaction, expert healthcare provider assessment of outcome, and durability with limited need for secondary revisions.

Aim of the study

To evaluate the modified Millard protocol informs of WRV flap in unilateral primary cheiloplasty regarding parents' opinion of scar visibility and maturity in addition to professional health care providers evaluation of philtrum column length symmetry.

Material and Method

- ✓ Case series study on 20 unilateral cleft lip infants, surgically repaired with WRVF for primary lip repair at Minia University as corporation protocol between the Pediatric Surgery Department and Oral and maxillofacial department.

- ✓ Inclusion criteria
  - unilateral Cleft lip
  - age range (1 day - 18 weeks)
  - medically free, fit for operation.
- ✓ Exclusion criteria
  - Patient with Syndromes
  - Age more than 6 months

- ✓ The ethical committee regulations of the research followed the World Medical Association Declaration of Helsinki.

Cases preparation:
All research subjects had multidisciplinary cleft care and planning.

- ✓ The operation was performed at the age of 10 weeks under general anesthesia, after scrubbing with betadine 10 %, The planned WRV flap primary cheiloplasty was accomplished relaying on surgical anatomic points & lines

- ✓ Landmark points & Lines:

<u>Points</u>:
Oral commissure points (1,2).
Mid-columellar point (point 3).
Alar point (The junction of most lateral and inferior of the ala) Point (4,5)
<u>On the Non-clefted side (medial segment)</u>
the height of Cupid's bow at the most superior point laterally (point 6)
Depth of the Cupid's bow at its most inferior point (point 7).
the height of Cupid's bow at the most superior point medially (point 8)

<u>On the clefted side (lateral segment)</u>
Depth of the Cupid's bow at its most inferior point (point 7*).
the height of Cupid's bow at the most superior point medially (point 8*)
<u>Lines:</u>
A line is drawn just above the white roll from (point 7) (point 8).
A line was drawn just above the white roll from (point 7*) (point 8*).
A line is drawn perpendicular to point 7 across the vermilion and mucosa which ends in the midline at the frenulum.
The rest of the lines are the same as Millard's rotation and advancement protocol.

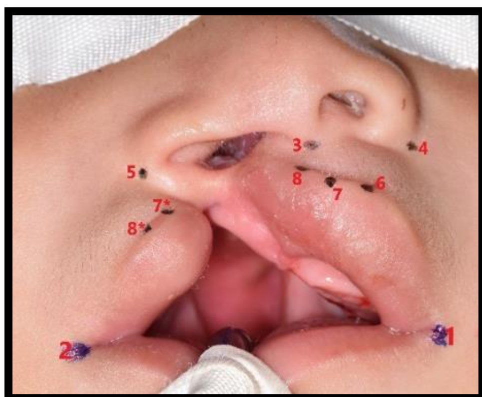


Figure1: Anatomical reference points

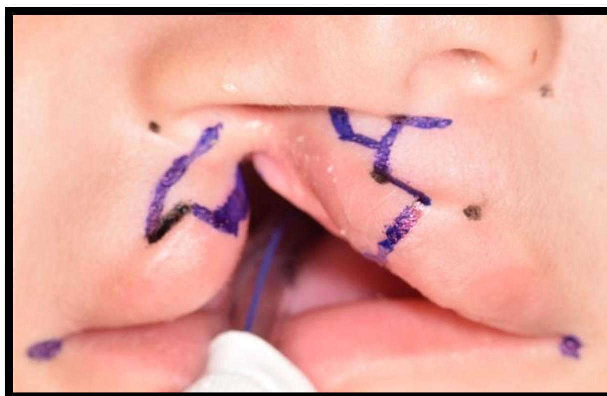


Figure2 : Anatomical reference lines

The first incisions as Millard rotation and advancement technique, then the WRV flap as designed:
On the non-clefted side sharp clean cutaneous cut from point 8 to point 7 just above the white roll, then a perpendicular incision down across the vermilion border and wet-dry mucosal junction in the midline. Excision of fibrotic, malformed lip portion (The vermilion, part of orbicularis muscle within the incision line and the red lip portion), and with bipolar diathermy, superior labial arteries were cauterized. Meticulous dissection of the orbicularis oris muscle from skin and underlying mucosa.
On the -clefted side, the incision is made from point 8* to point 7* just above the white roll, then turn down toward the gingivolabial sulcus in a perpendicular manner, after that the red lip segment was then excised.
A small triangle of skin and muscle between Millard's incisions on cleft side and the incision of the WRF was excised. The rest of the procedure was finalized as Millard's protocol.

The first step of the actual repair and suture is the nasal base or what called nasal sill With the approximation of the lateral nasal lining and the advanced alar base with the septal mucosal flap, secondary to nasal repair is the, muscle continuity restoration with simple interrupted sutures with 4-0 vicryl starting superiorly at the nasal sill then muscle approximation at the level of points 8 and 8*.

For proper construction of the white roll and vermilion on the cleft side, thickness, and length of the vermilion flap of the cleft segment was compared with that of the normal side. And it could necessities minor adjustment or trimming

Skin closure was done by using colorless Vicryl 6-0 interrupted sutures from point 8 to point 8* and point 7 to point 7*.

It's was really crucial not to do any sutures over the white roll, however it could be just 1-mm below or above the white roll at these points.

The lip residual cutaneous and mucosal sutures were approximated using interrupted 6-0.

Steri-Strip™ Reinforced Adhesive Skin Closures were horizontally used after that from side to side, and sutures were removed after 4 days.

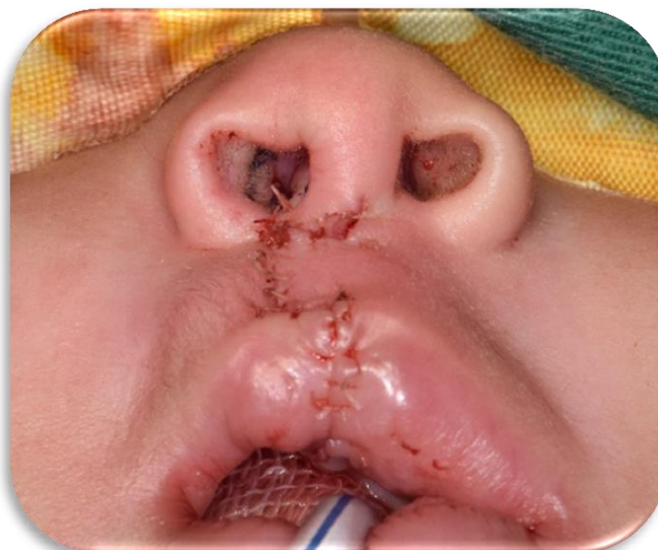


Figure3: Immediate Post Operative

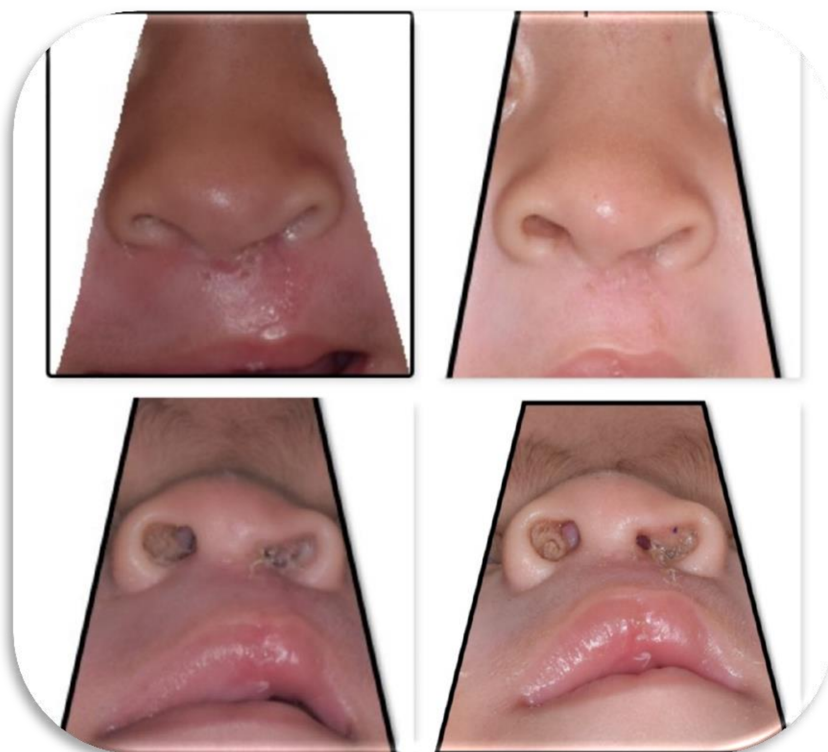


Figure 4: Cropped Nasolabial images for professional evaluation of Philtrum column symmetry Left of the figure (1 month) & Right of the figure (3 months)

Assessment and evaluation

We were focused on quality assessment of the resultant esthetic outcomes for the parties in charge, either the infant parents or the professional health care providers and surgeons.

Professional assessment

For professional quality assessment. Two well know consultants were our third-party blind assessors, the first was an orthodontic with 10 years of experience with cleft patients management, in general, to be familiar with aesthetic results specifically for the cleft patient, and the 2nd was an Oral and maxillofacial surgeon who did not participate at any preparation or operative steps rated the standardized cropped clinical photographs (Frontal, Lateral profile, and submental) true size with Nikon camera D5300, sigma lens 105mm, ring flash and 2 soft boxes 800 w, black mattress as a Croma) following Asher McDade developed nasolabial appearance assessment protocol

After clinical photographs were manipulated and cropped, the third-party inspectors were asked to assess the outcome variable inform of philtrum column length symmetry between operated and natural sides at 1 and 3 months postoperatively,
The assessment sheet has a visual analog scale (VAS) of 100 mm. The results (0 = very bad / 100 excellent)

Guardian satisfaction

though for the 20 cases, 20 mothers were chosen in this study scar visibility and maturation satisfaction evaluation, one month and three months postoperatively.

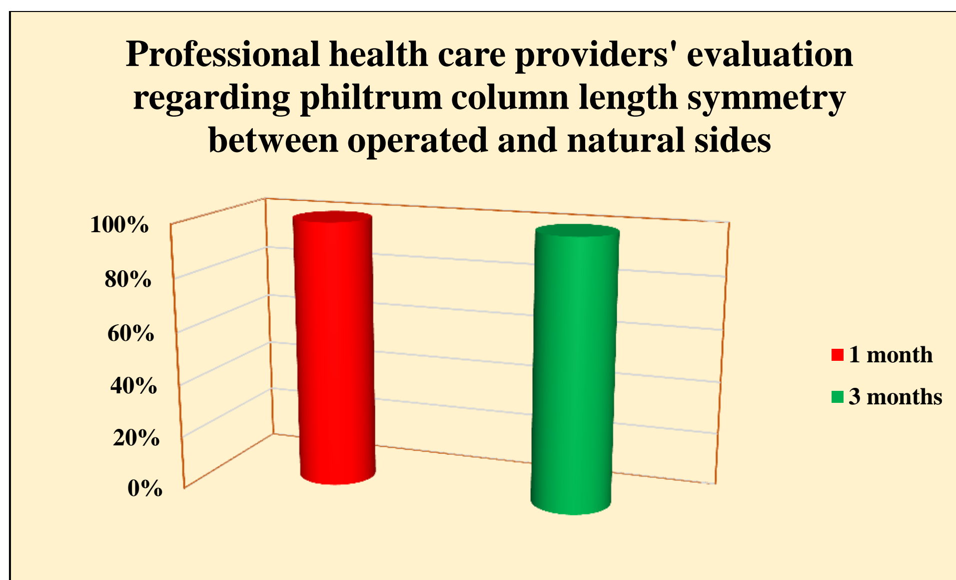
Rating: 1 (very satisfied) 2 (satisfied) 3 (unsatisfied) 4 (disappointed) 5 (very disappointed)
All the collected data were organized and statistically analyzed with IBM SPSS Statistics 29 software.

Results

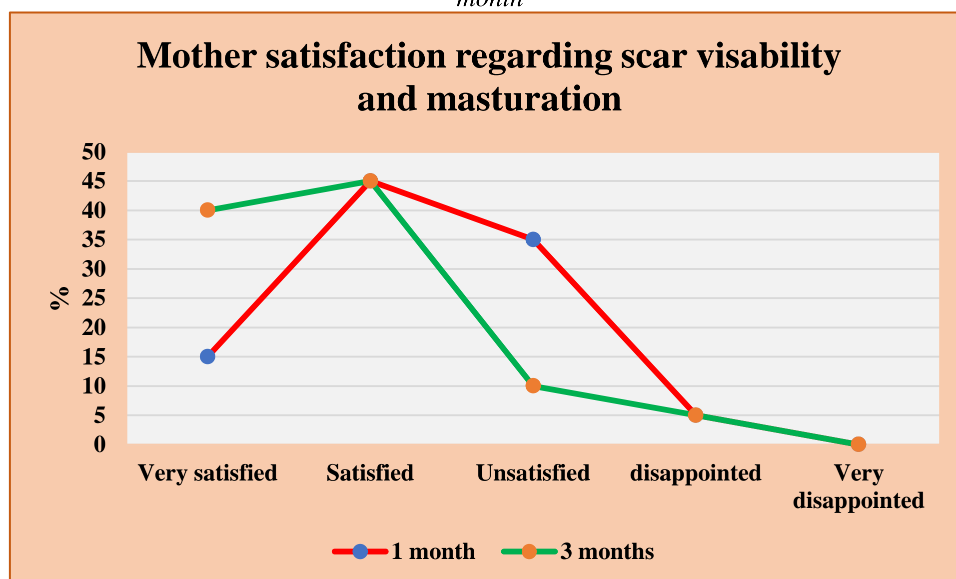
A Total of 20 Patients (N=20) 8 males and 12 females, with an age range of (80 -120 days) at operation time with an average age (of 100.65 days).

Three Outcome variables were assessed:

- Professional health care providers' evaluation regarding philtrum column length symmetry between operated and natural sides at 3 months compared with that at 1 month Postoperatively.
- Mothers' satisfaction regarding scar visibility and maturation at 3 months compared with 1 month postoperatively.



there was a significant difference in Philtrum column lenght symmetry at 3 months compared with that at 1 month



There was a significant increase in patients' mother satisfaction at 3 months compared with 1 month.

Discussion

Millard Protocol is commonly applied for unilateral cleft lip repair, however regarding the suture line when interferes with the continuity of the anatomical and aesthetic white roll landmark. The scar visibility on the peak of Cupid's bow created a dilemma that motivated further research to gain more anatomical repair. To achieve the above-mentioned idea, the conventional surgical technique for unilateral cleft lip repair was modified by Mishra in 2015 via WRV flap aiming to preserve that hallmark aesthetic sign which promotes less scar visibility either for professional healthcare givers and for sure improves the guardian's reception and evaluation concluding better resultant aesthetic quality.

WRV Triangular flap added value such as lengthening the philtrum column when it turns down and this a key difference step than that used with Millard's method.

Regarding the study design, we choose to include unilateral complete cleft cases to focus upon comparison of either nostril, lip symmetry or scar visibility with the contralateral non clefted side, and we tried to elaborate the scope of application of WRV flap. The three outcome variables we choose to evaluate were the foundation of our statistical and sample size model.in the light of unilateral cleft lip incidence.

We were aiming to achieve a non-biased assessment as we can throughout the evaluation and analysis of the results, thus A third-party assessment model was chosen for professional

quality assessment. Two well know consultants were our third-party blind assessors, the first was an orthodontic with 10 years of experience with cleft patients' management, in general, to be familiar with aesthetic results specifically for the cleft patient, and the 2nd was an Oral and maxillofacial surgeon who did not participate at any preparation or operative steps.

The Aim and methodology of our research were targeting simple aesthetic results such as philtrum column symmetry which could be the primary anatomical landmark target to be well established , and that's the same target for the too.

In light of the results we had, a significant increase in professional evaluation at three months regarding philtrum column length symmetry which is the same time parallel to the guardian reception for the results and scar visibility improvement, which correlates with the achievement of both targets and priorities.

For Guardian's evaluation, we can justify that the unsatisfied percentage at 1-month post-operative was due to the presence of residual suture materials fresh marks, and non-blinded edges yet, the scar is still immature.

Regarding the disappointed patient guardian, we justify that this particular participant was having a psychosocial issue and was hardly uncooperative.

Conclusion

The aesthetic outcome informs of philtrum column length symmetry, and patients' mothers' satisfaction, the WRV flap offers a consistent, rising modification of Millard advancement rotational protocol for the management of unilateral complete cleft lip cheiloplasty.

Recommendation

We do recommend applying that research strategy on bigger sample-sized projects and including comparative studies for bilateral cases.

Declaration

The authors and the whole research participants clarify there is no sponsorship or conflict of interest and all the expenses or cost are provided by the research team participants themselves.

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