

Evaluation of esthetic outcome following bilateral cleft lip repair using the Mulliken technique: An assessment of 284 cases

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ABSTRACT

Aim: The aim of the study was to evaluate the esthetic outcome in bilateral cleft lip repairs after using the Mulliken technique using a simplified scale assessed by medical and nonmedical people.

Materials and Methods: A total of 284 patients were assessed retrospectively. A three-point scale was devised, and the assessment was carried out on standardized photographs arranged in a presentation format on a screen. The areas assessed were lip, nose, and general facial appearance. Inter-rater reliability was calculated for individual groups and among the groups.

Results: The average of the scores of both groups was 2.5 indicating good satisfaction levels. The non medical professionals group gave higher values. The general facial appearance had higher values as compared to the lip and nose assessment. Inter-rater reliability was high. **Conclusion:** The overall satisfaction levels by both groups were high. Nonmedico group gave higher values, which was considered important as they represent the society that the cleft children interact with. The general facial appearance got high values which shows that individual parts of the face are not scrutinized by individuals. The Mulliken technique of repair gives overall good esthetic results.

Key words: Bilateral cleft lip, esthetic index, Mulliken, photography

INTRODUCTION

Bilateral cleft lip is a complex deformity which requires understanding of the anatomical defects and precise correction due to the cleft. The aim of bilateral cleft lip repair is the accurate restoration of the anatomical

landmarks and functional units in the upper lip.^[1] Mulliken is the pioneer of synchronous bilateral cleft lip and nasal deformity repair.^[2] The evaluation of the esthetic outcome of the surgery is considered to be very important as lower self-esteem, dissatisfaction with facial appearance, behavioral problems, and even depression and anxiety have been reported in relation to cleft lip and palate.^[3] These ultimately affect the overall health-related quality of life.^[4,5]

Many scoring systems are available to assess the results of surgery performed for repair of cleft lips. While standards are clearly established for the assessment of functional outcomes, it is not so for esthetic outcome.^[6,7] For esthetic outcome assessment, the approaches are usually divided into quantitative and qualitative analysis. Quantitative analysis involves anthropometric measurements expressed in numerical data.^[8-10] This quantitative analysis is not relatable to the laypersons or the parents. On the other hand, qualitative analysis is based on evaluation of overall appearance from an image of the patients or by directly looking at patients which is a more relatable evaluation.^[11,12]

Direct clinical assessment, clinical photograph evaluation, clinical videographic assessment, and three-dimensional evaluation are the common methods of outcome evaluations.^[13] The most popularly used scoring technique has been the Asher-McDade scoring system.^[14] Although some authors have opposed this system stating it to be a highly subjective and abstract method of evaluation.^[15]

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In our study, we attempted to use a simplified version of the Asher-McDade scoring system reducing the scoring to just three grades as opposed to the five-point scoring system that is done on standardized photographs by both medical professionals and nonmedical professionals. The idea of including laypersons into our study was to see the agreement of observations between the two groups and also because it reflects how cleft patients are perceived in the society.

MATERIALS AND METHODS

This was a retrospective study with a sample size of 284 patients. All patients were of school-going age group at the time of assessment. The duration of the study was between November 2014 and November 2015. The patients included all those cases of repaired bilateral cleft lip and palate that were operated between March 2004 and November 2015 and provided they had representative pre- and post-operative photographs. All these patients had a minimum of 1-year follow-up to 10-year follow-up.

Photographs that were used in the study were only the frontal view. The manner in which they were taken was standardized as follows:

- The patient is made to look forward with as much as 70%–80% of the face visible
- Photographer stands about 2 feet from the patient (for a frontal view)
- Pictures were taken to capture both ears in equal measures as much as possible.

It was difficult to adhere to all the points in case of babies. However, it was tried as much as possible. Photographs were taken by a trained staff. Smile train standards of photography were followed.

The photographs of the same view were chosen for each patient and a single pre- and post-operative photograph was placed side by side in the form of a slideshow for all 284 patients. The display was on a screen with dimensions 30 cm × 40 cm. Following this, the rater was made to sit in front of the screen in a well lit room. The assessment was done on 3 consecutive days, with 100 slides assessed on day 1, 100 on day 2, and last 84 on day 3. The raters were five medical professionals, and five were non medical professionals. The five medical professionals were a dentist working in nearby clinic, an orthodontist, anesthesiologist, a pediatrician, and a maxillofacial surgeon. These professionals were not regularly engaged with cleft patient treatments. The non medical professionals were the parents, a school teacher, a lawyer, a physical education instructor, and a social

worker. The raters were to score the three regions, i.e., lip, nose, and general facial appearance according to the rating scale for each patient. The rating scale was as follows:

- 1 = poor appearance
- 2 = fair appearance
- 3 = good appearance.

A total satisfaction score for each category was assessed by the summation of individual scores by each judge and then divided by the sample size. The inter-rater reliability was calculated with Cronbach alpha coefficient for each group and also between the groups using Statistical Package for the Social Sciences for Windows, 19.0 (SPSS, Inc., Chicago, IL, USA).

RESULTS

A total of 284 patients were evaluated in the study. There were 107 females (37.6%) and 177 males (62.3%). There were 61 bilateral cleft lip cases (21.5%) and 223 bilateral cleft lip and palate (78.5%) cases. All cases included were nonsyndromic. Of these, 211 were complete cleft lips (74.3%) and 73 were incomplete cleft lips (25.7%). The scores given to each category by each of the judges is given in Tables 1 and 2 as an average. The average score for all categories was above 2.5 which indicates very good results by both medical professionals and the non medical professionals [Figures 1-4]. The inter-rater reliability of this study was good, being 0.99 as judged by the Cronbach's formula for each of the two groups and 0.97 for the two different groups.

DISCUSSION

Our study shows a very good satisfaction rate by all judges individually and as an average. The results show

Table 1: Ratings given by the medical professionals as an average of the 284 patients

Region assessed	Evaluators	Mean value	Mean score
Lip	1	2.35	2.57
	2	2.67	
	3	2.59	
	4	2.43	
	5	2.80	
Nose	1	2.39	2.3
	2	2.13	
	3	2.35	
	4	2.41	
	5	2.22	
General facial appearance	1	2.75	2.73
	2	2.69	
	3	2.82	
	4	2.66	
	5	2.73	

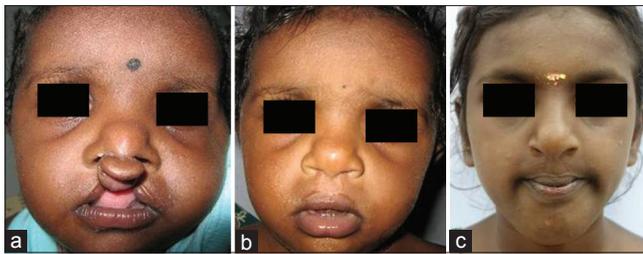


Figure 1: Long-term follow-up photographs of a patient treated by Mulliken technique. (a) Three-month-old baby with bilateral complete cleft lip and palate. (b) One-year follow-up with good lip form. (c) Ten-year follow-up showing well-formed lip



Figure 2: Two year follow-up of patient treated by Mulliken method. (a) Four-month-old baby with bilateral complete cleft lip. (b) Two years later, satisfactory lip form



Figure 3: Three-year follow-up of patient treated by Mulliken method. (a) Three-month-old baby with bilateral complete cleft lip. (b) Three years later, lip has healed well



Figure 4: Two year follow-up of patient treated by Mullikens method. (a) Three-month-old baby with bilateral complete cleft lip. (b) Two years later, satisfactory lip form

Table 2: Ratings given by the nonmedicos as an average of the 284 patients

Region assessed	Evaluators	Mean value	Mean score
Lip	1	2.92	2.83
	2	2.98	
	3	2.75	
	4	2.87	
	5	2.64	
Nose	1	2.45	2.46
	2	2.32	
	3	2.53	
	4	2.48	
	5	2.56	
General facial appearance	1	2.81	2.86
	2	2.92	
	3	2.96	
	4	2.76	
	5	2.83	

that the more critical of the two groups was the medical professionals. This goes to show the critical nature of assessment by them, and the fair knowledge about the finer deformities makes them give lower values. Whereas the scores for the non medical professionals showed higher scores indicative of higher satisfaction

levels. It may be because the change in appearance after treating bilateral cleft lips is so drastic as compared to the original defect that the postoperative picture invariably is impactful. We feel that scores given by non medical professionals are more relevant as they truly represent the faction of population that cleft patients would be interacting within their day-to-day life.

The general facial appearance score was the highest in both groups, indicating that it is the overall appearance of the patients that people accept and individual parts of the face are not scrutinized so carefully. Furthermore, the average score for all categories was above 2.5 which indicates very good results by both medical professionals and the laymen.

In the literature, usually, two-dimensional photographs have been used for esthetic outcome evaluation of cleft lips using the Asher-McDade scale.^[14,16] The Asher-McDade esthetic index is relatively complicated and time consuming because four different nasolabial parameters are rated on two photographs (frontal and

profile) with the aid of a five-point scale.^[16] In a recent study published by Bonanthaya *et al.*,^[17] an anatomical subunit-based outcome evaluation using a two-point rating system was applied to separately analyze a total of 12 components of lip, nose, and scar. They used these patients of bilateral cleft lip treated by Millard's technique. It is a fair means of objectively evaluating esthetic outcomes.

We intended to include the group of laymen to evaluate our patients; hence, we had to be very careful about the scoring system and the parameters to be judged as more complex rating systems would be incomprehensible for laymen. The importance and value of laymen cannot be emphasized more; they are the truest measure of how the child will be perceived socially and is encouraging since the laymen gave the highest scores for the results at our center treated by the Mulliken technique of bilateral cleft lip and palate.

CONCLUSION

The Mulliken technique for closure of bilateral cleft lips gives very good results as validated by the way the appearance of the patient is perceived by the layman (who is the representative of the society). The general facial appearance received the highest score which shows that the overall appearance of the patient does not take into account the small incongruities of the lip and the nose. The overall facial balance is a combination of all features, and minor discrepancies are excused by an individual's eye. The satisfaction levels with the Mulliken technique in bilateral clefts are excellent and should be regularly adopted for primary bilateral cleft lips.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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