

## Comparison of Objective and Subjective Methods in the Assessment of Unilateral Cleft Lip Repair.

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### Abstract

**Background:** Evaluation of outcomes following unilateral cleft lip repair requires reliable assessment methods. While aesthetic results are traditionally judged subjectively, objective measurements provide quantitative insight into anatomical symmetry. The relationship between these two approaches remains unclear. This study aimed to analyze the agreement and discrepancy between subjective and objective methods in assessing outcomes following unilateral cleft lip repair. **Methods:** A prospective analytical study was performed on patients undergoing primary unilateral cleft lip repair using a standardized surgical technique. Subjective assessment was carried out independently by observers using the Visual Analog Scale (VAS), while objective analysis involved anthropometric measurements of key nasolabial parameters. The primary objective was to compare findings derived from both assessment methods. **Results:** Subjective assessment yielded consistently positive ratings with minimal variation among observers, suggesting agreement in perceived aesthetic outcomes. In contrast, objective analysis identified measurable differences across specific anatomical parameters. While several features demonstrated acceptable symmetry, discrepancies were evident in selected regions, particularly involving the Cupid's bow and nasal alignment. Notably, these objective findings were not uniformly reflected in subjective evaluations, indicating a divergence between perceived appearance and quantified anatomical symmetry. **Conclusion:** Subjective and objective evaluation methods provide complementary perspectives in assessing outcomes following cleft lip repair. Subjective assessment reflects overall aesthetic perception, whereas objective analysis identifies subtle anatomical discrepancies. The observed differences between these approaches highlight the importance of integrating both methods for a comprehensive and accurate evaluation of surgical outcomes.

**Keywords:** Aesthetic outcome assessment; subjective evaluation; objective evaluation; visual analog scale; anthropometric analysis;; cleft lip repair.



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### INTRODUCTION

The surgical management of unilateral cleft lip has undergone substantial evolution, with various techniques developed to restore both function and facial aesthetics. Foundational approaches such as the triangular flap technique introduced by Tennison and later modified by Randall, along with the rotation-advancement method described by Millard, have significantly influenced contemporary cleft lip repair [1–3]. While these techniques have improved surgical outcomes, the evaluation of postoperative aesthetics remains a complex and multifaceted challenge.

Cleft lip and palate continue to represent a significant global health concern, with their occurrence influenced by genetic predisposition and environmental factors[4,5]. Beyond functional rehabilitation, the aesthetic outcome of cleft lip repair plays a crucial role in psychosocial development and overall quality of life. Consequently, accurate and reliable assessment of surgical results is essential for evaluating treatment success and guiding clinical decision-making.

Traditionally, assessment of aesthetic outcomes has relied on subjective methods, including clinical judgment and rating systems such as aesthetic indices and visual analog scales. These approaches provide valuable insight into perceived appearance and patient satisfaction; however, they are inherently influenced by observer variability and bias. Studies have

demonstrated that evaluations may differ significantly between clinicians, patients, and lay observers, reflecting the subjective nature of aesthetic perception [6–9].

In contrast, objective assessment methods employ anthropometric measurements and imaging-based analyses to quantify facial symmetry and anatomical relationships. These techniques enable detailed evaluation of parameters such as lip height, vermilion continuity, nasal alignment, and symmetry of the Cupid's bow. Advances in three-dimensional imaging and digital analysis have further enhanced the precision and reproducibility of such measurements [10–12].

Despite the availability of both subjective and objective approaches, discrepancies between perceived and measured outcomes have been consistently reported. Studies comparing observer-based assessments with quantitative analyses have demonstrated that results considered satisfactory subjectively may still exhibit measurable asymmetry when evaluated objectively [13–15]. This divergence highlights the limitations of relying exclusively on a single method and underscores the need for integrated evaluation strategies.

Furthermore, outcome studies of unilateral cleft lip repair, including those involving the Tennison–Randall technique, have shown generally favorable results, although residual asymmetries in the nasolabial region remain common [16,17]. Advanced photographic and three-dimensional analyses have confirmed that subtle discrepancies in lip and nasal symmetry may persist despite clinically acceptable appearances [18,19]. Additionally, long-term multicenter studies emphasize the importance of standardized outcome assessment protocols to improve comparability across treatment centers [14,20].

The present study is based on a prospective clinical dataset of unilateral cleft lip repair using a standardized surgical technique. Unlike conventional studies that primarily focus on surgical outcomes, this investigation aims to compare subjective and objective methods of assessment, with the objective of evaluating their agreement and identifying potential discrepancies in the evaluation of aesthetic results.

## **MATERIALS AND METHODS**

This prospective analytical study was conducted in the Department of Oral and Maxillofacial Surgery at a tertiary care center in India over a two-year duration. The study was specifically designed to compare subjective and objective methods of evaluating aesthetic outcomes following unilateral cleft lip repair.

The study included ten patients with unilateral complete cleft lip who underwent primary surgical correction using a standardized technique. Inclusion criteria were defined to ensure uniformity of the study population, including minimum age, weight, and hemoglobin requirements, while patients with syndromic associations, bilateral clefts, or incomplete deformities were excluded.

All patients underwent surgical repair under general anesthesia using a consistent operative protocol to minimize procedural variability. Standardized postoperative photographic documentation, including frontal and basal views, was obtained at three months to allow uniform evaluation across all cases.

Subjective assessment was performed independently by three observers using the Visual Analog Scale (VAS), providing a measure of perceived aesthetic outcome. Objective evaluation was conducted using anthropometric analysis of six key nasolabial parameters derived from photographic measurements.

The primary objective of the analysis was to compare findings obtained from subjective scoring and objective measurements. Statistical evaluation included the Mann–Whitney U test for subjective data and Student's t-test for objective variables. Comparative interpretation was undertaken to identify agreement and discrepancies between the two assessment methods, with statistical significance set at  $p < 0.05$ .

## **RESULTS**

All patients completed the follow-up period and were included in both subjective and objective analyses. Subjective evaluation demonstrated consistently positive ratings, with minimal variation among observers, indicating agreement in the perceived aesthetic outcome.

The statistical comparison of subjective and objective findings is summarized in Table 1. Subjective scores suggested favorable outcomes across all evaluated parameters. In contrast, objective measurements revealed variability in anatomical symmetry.

While parameters such as vermilion continuity, red lip adequacy, columellar position, and nostril symmetry showed no statistically significant differences, significant deviations were identified in the symmetry of the Cupid's bow and centrality of the nasal bridge.

A comparison between the two assessment approaches revealed a divergence in certain cases. Features that were rated as satisfactory on subjective evaluation occasionally demonstrated measurable asymmetry on objective analysis. This indicates that minor anatomical discrepancies may not be consistently perceived during visual assessment.

At the same time, parameters with acceptable objective measurements generally corresponded with favorable subjective scores, suggesting partial agreement between the two methods. Overall, subjective evaluation tended to present a more favorable interpretation, whereas objective analysis provided a more detailed assessment of structural symmetry.

**Table 1: Statistical Comparison of Subjective and Objective Assessment of Nasolabial Parameters**

| Parameter               | Subjective Score (VAS, Mean $\pm$ SD) | Objective Measurement (Mean $\pm$ SD) | p-value | Statistical Significance |
|-------------------------|---------------------------------------|---------------------------------------|---------|--------------------------|
| Vermilion continuity    | 7.5 $\pm$ 0.8                         | 7.8 $\pm$ 0.6                         | >0.05   | Not significant          |
| Cupid's bow symmetry    | 7.2 $\pm$ 0.9                         | 5.5 $\pm$ 1.1                         | <0.05   | Significant              |
| Red lip adequacy        | 7.4 $\pm$ 0.7                         | 7.6 $\pm$ 0.5                         | >0.05   | Not significant          |
| Columellar centrality   | 7.3 $\pm$ 0.8                         | 7.5 $\pm$ 0.6                         | >0.05   | Not significant          |
| Nostril symmetry        | 7.2 $\pm$ 0.9                         | 7.4 $\pm$ 0.7                         | >0.05   | Not significant          |
| Nasal bridge centrality | 7.3 $\pm$ 0.8                         | 5.8 $\pm$ 1.0                         | <0.05   | Significant              |

## DISCUSSION

Assessment of aesthetic outcomes following unilateral cleft lip repair is inherently complex, as it involves both measurable anatomical reconstruction and subjective perception of facial appearance. The present study was designed to compare these two approaches and evaluate their level of agreement in clinical outcome assessment.

Subjective evaluation in this study demonstrated consistently favorable ratings, with minimal variability among observers. This reflects the overall clinical acceptability of the surgical results and is consistent with previous studies highlighting the role of observer-based assessment tools such as aesthetic indices and Visual Analog Scales [6–9]. Subjective evaluation captures the holistic perception of facial aesthetics and is influenced by factors such as scar visibility, symmetry, and overall facial harmony.

In contrast, objective assessment provided a more detailed and parameter-specific evaluation. While most anatomical features, including vermilion continuity, red lip adequacy, columellar position, and nostril symmetry, showed acceptable outcomes, significant deviations were identified in the symmetry of the Cupid's bow and nasal bridge alignment. These findings are consistent with previous anthropometric studies that have reported persistent nasolabial asymmetries despite technically successful surgical repair [10–12].

A key finding of this study is the discrepancy between subjective perception and objective measurement. Certain anatomical deviations identified objectively were not consistently reflected in subjective evaluation. This observation supports previous reports indicating that perceived aesthetic outcomes do not always correlate with quantitative measurements [13–15]. Minor asymmetries may be overlooked in subjective assessment when overall facial balance is maintained.

Variability in subjective assessment is an important limitation, as observer perception is influenced by experience, expectations, and individual bias. Studies have shown differences in evaluation between clinicians, patients, and laypersons, further emphasizing the subjective nature of aesthetic judgment [6–8]. In contrast, objective methods provide reproducible and standardized measurements, reducing observer-related variability and allowing precise assessment of anatomical relationships.

However, objective methods also have limitations. While they quantify structural symmetry, they may not fully represent the overall aesthetic impression perceived by the human eye. A quantitatively symmetrical result may not always be

perceived as aesthetically pleasing, and conversely, minor asymmetries may not significantly impact perceived appearance. This highlights the complementary nature of subjective and objective approaches rather than their interchangeability.

Studies evaluating outcomes of cleft lip repair, including those using the Tennison–Randall technique, have reported generally satisfactory results, although residual asymmetries in specific anatomical landmarks remain common [16,17]. Advanced imaging techniques, including photographic and three-dimensional analysis, have further confirmed that subtle discrepancies often persist despite acceptable clinical outcomes [18,19]. Additionally, multicenter studies emphasize the importance of standardized outcome assessment protocols to improve consistency and comparability across clinical settings [14,20].

The clinical implications of these findings are significant. Reliance solely on subjective evaluation may lead to overestimation of surgical success, whereas exclusive dependence on objective measurements may overemphasize minor discrepancies. Therefore, an integrated approach combining both methods is essential for a balanced and comprehensive assessment of aesthetic outcomes.

The limitations of this study include the small sample size and short follow-up duration, as well as the lack of detailed correlation analysis between individual subjective scores and objective parameters. Future studies with larger cohorts and long-term follow-up are required to further clarify the relationship between perception and measurement.

In summary, this study demonstrates that subjective and objective methods assess different dimensions of aesthetic outcome, and their combined use provides a more accurate and clinically meaningful evaluation of unilateral cleft lip repair.

## CONCLUSION

The present study highlights that subjective and objective methods evaluate different aspects of aesthetic outcomes following unilateral cleft lip repair. Subjective assessment demonstrated consistently favorable ratings, reflecting overall clinical acceptability and perceived facial harmony. In contrast, objective analysis identified specific anatomical discrepancies, particularly in the Cupid's bow and nasal alignment, which were not consistently detected through subjective evaluation.

The observed lack of complete agreement between these methods indicates that reliance on a single approach may provide an incomplete assessment of surgical outcomes. Subjective evaluation captures global aesthetic perception, whereas objective measurement offers precise quantification of anatomical symmetry.

These findings emphasize the need for an integrated assessment framework that combines both subjective and objective methods to achieve a balanced and clinically meaningful evaluation of cleft lip repair outcomes. Such an approach may improve the accuracy of outcome assessment and support better-informed clinical decision-making.

Despite limitations including a small sample size and short duration of follow-up, this study contributes to the understanding of outcome evaluation in cleft lip surgery. Further research incorporating larger populations and correlation analysis between subjective and objective parameters is recommended to strengthen these observations.

## REFERENCES

1. Tennison CW. The repair of the unilateral cleft lip by the stencil method. *Plast Reconstr Surg*. 1952;9(2):115–120.
2. Randall P. A triangular flap operation for the primary repair of unilateral clefts of the lip. *Plast Reconstr Surg*. 1959;23(4):331–347.
3. Millard DR Jr. A radical rotation in single harelip. *Am J Surg*. 1958;95(2):318–322.
4. Mossey PA, Little J, Munger RG, Dixon MJ, Shaw WC. Cleft lip and palate. *Lancet*. 2009;374(9703):1773–1785.
5. Dixon MJ, Marazita ML, Beaty TH, Murray JC. Cleft lip and palate: understanding genetic and environmental influences. *Nat Rev Genet*. 2011;12(3):167–178.
6. Johnson N, Sandy J. An aesthetic index for evaluation of unilateral cleft lip repair. *Eur J Orthod*. 2003;25(3):243–249.
7. Trotman CA, Faraway JJ, Losken HW, van Aalst JA. Functional outcomes of cleft lip surgery. Part I: Study design and surgeon ratings of lip disability and need for lip revision. *Cleft Palate Craniofac J*. 2007;44(6):598–606.
8. Gkantidis N, Papamanou DA, Karamolegkou M, et al. Aesthetic outcome of cleft lip and palate treatment: perceptions of patients, families, and health professionals compared to the general public. *Eur J Orthod*. 2013;35(3):372–378.
9. Asher-McDade C, Brattström V, Dahl E, et al. A six-center international study of treatment outcome in patients with clefts of the lip and palate: Part 4. Assessment of nasolabial appearance. *Cleft Palate Craniofac J*. 1992;29(5):409–412.
10. Edler R, Abd Rahim M, Wertheim D, Greenhill D. The use of facial anthropometrics in aesthetic assessment. *Cleft Palate Craniofac J*. 2010;47(1):48–57.

11. Heller M, Göz G, Nkenke E, Schwenzer-Zimmerer K. Clinical-anthropometric and aesthetic analysis of nose and lip in unilateral cleft lip and palate patients. *Cleft Palate Craniofac J.* 2011;48(4):388–393.
12. Meyer-Marcotty P, Alpers GW, Gerdes ABM, Stellzig-Eisenhauer A. Impact of facial asymmetry in visual perception: a 3-dimensional data analysis. *Am J Orthod Dentofacial Orthop.* 2010;137(2):168.e1–168.e8.
13. Trotman CA, Faraway JJ. Modeling facial movement in repaired cleft lip and palate patients. *Cleft Palate Craniofac J.* 2013;50(4):481–490.
14. Semb G, Brattström V, Mølsted K, et al. The Eurocleft study: intercenter study of treatment outcome in patients with complete cleft lip and palate. *Cleft Palate Craniofac J.* 2005;42(1):64–68.
15. Power SM, et al. Assessment of treatment outcome in unilateral cleft lip: reliability and bias in observer ratings. *Plast Reconstr Surg.* 2013;132(2):336–345.
16. Bilwatsch S, Kramer M, Haeusler G, et al. Nasolabial symmetry following Tennison-Randall lip repair: a three-dimensional approach. *J Craniomaxillofac Surg.* 2006;34(5):253–262.
17. Iliopoulos C, Mitsimponas K, Lazaridou D, et al. Aesthetic evaluation of the Tennison-Randall technique. *J Craniomaxillofac Surg.* 2014;42(8):1679–1683.
18. Pigott RW, Pigott BB. Quantitative measurement of symmetry from photographs following surgery for unilateral cleft lip and palate. *Cleft Palate Craniofac J.* 2010;47(4):363–367.
19. Russell AJ, et al. Three-dimensional assessment of lip asymmetry after cleft repair. *Plast Reconstr Surg.* 2015;136(5):1046–1053.
20. Tse R. Unilateral cleft lip: principles and practice of surgical management. *Semin Plast Surg.* 2012;26(4):145–155.