

# Proportional Change in Nostril Width After Unilateral Cleft Lip Repair

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## Introduction:

A goal of the Operation Smile Post Operative Program is to assess outcomes of cleft lip and palate surgery based on pre- and postoperative digital pictures.

Standardized high quality digital images of each patient are collected at mission sites before surgery, directly after surgery, and at one-week, six-month and one-year post-operative visits.

Images are sent to experienced cleft surgeons for unbiased evaluation. Immediate postoperative pictures are used for auditing purposes.<sup>1</sup>

A concern of the Post Operative Program is the high incidence of nostril width asymmetry, especially when incisions around the ala are avoided.

## Methods

A retrospective study was designed to measure the significance of the change in the proportional change of nostrils width symmetry six to twelve months after surgery. From our outcomes database, 81 patients receiving unilateral cleft lip repairs during Operation Smile missions in November 2007 were selected. Patients were from ten different mission sites and had different surgeons.

The figure displays two side-by-side screenshots of the 'Operation Smile Outcomes Evaluation' software interface. Both screenshots are for a mission in 'Brazil, Fortaleza- Sept. 2008 POY'. The left screenshot is for a 'Unilateral Cleft Lip Repair' patient (Patient Evaluation Letter: R). The right screenshot is for a 'Bilateral Lip Repair 1' patient (Patient Evaluation Letter: DD). Each interface includes tabs for 'Outcome Evaluation', 'Immediate POP and Other Pictures', and 'Speech Evaluation'. The 'Outcome Evaluation' section contains numerous checkboxes for surgical procedures (e.g., Primary Lip Repair, Primary Palate Repair, Lip Revision, Palate Revision, Fistula Closure) and anatomical features (e.g., Orticocoea, Pharyngeal Flap, Z-plasty, Injection, Furlow for VPI, Scar Excision, Skin Graft, Tumor Excision, Flap, Other...). Below these are sections for 'Symmetry' (Cupid's Bow, Lateral Lip, Free Vermilion, Dry/Wet) and 'UCL Outcome' (scored / 10). The 'Bilateral Lip Repair 1' section includes 'Symm. of Cupid's Bow', 'Nasal Symmetry', 'Vert Symm of Lat Lip', and 'Horz. Symm of Lat Lip'. The 'Fistula' section has checkboxes for 'Pre-Op', 'Post-Op', 'Junc. Firm/Secondary', 'Hard Palate', 'Junc. Hard/Soft', and 'Soft Palate', along with 'Length (mm)', 'Width (mm)', and 'Symptomatic' fields. The 'Outcome Scar' section includes 'Hypertrophy Discoloration', 'Spreading Suture Marks', and 'Outcome Scar' (scored / 4). Both screenshots show 'Pre-Op. Image- Frontal/Hard Palate' and 'Post-Op. Image- Frontal/Hard Palate' with corresponding photographs. The 'BCL Outcome' (scored / 20) and 'Improvement Scale' are also visible at the bottom of each form.

Figure 1. Samples from the Operation Smile Outcomes Database

The proportion of change over time between the cleft and the non-cleft sides was measured in digital images using the measuring tool available in Acrobat Writer.

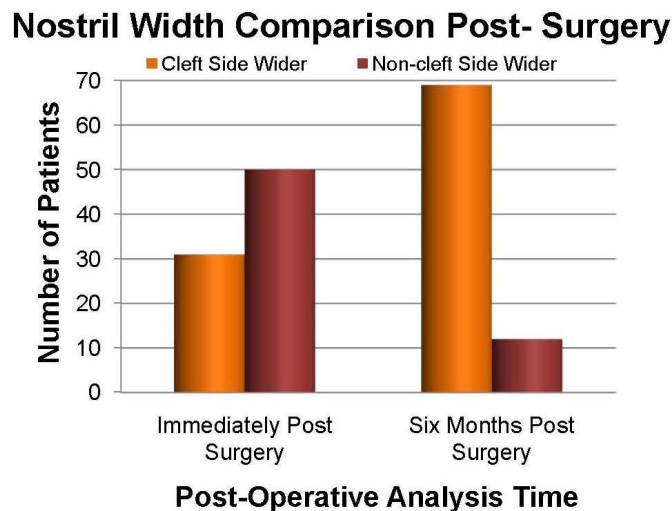
### Analysis & Results



*Figure 2: Clinical examples of proportional change in nostril width after unilateral cleft lip repair. Pictures taken right after surgery and at least 6 months after surgery.*

Immediately after surgery the cleft nostril was wider than the non-cleft side in 31 patients (average 111.38%), and narrower in 50 patients (average 87.62%). There was a widening of the nostril base in 72 patients and a constriction in 8. After six months, the cleft nostril was wider than the non-cleft side in 69 patients and narrower in 12 patients. The average change in nostril width was an increase of 18.42% (Range: -16.93 to 114.19). The average increase in nostril width in patients who ended with a narrower nostril after surgery was higher (21.65%) than in patients who ended with a wider nostril (13.21%). The proportional change in nostril width over time was analyzed using a paired t-test. None of these changes were found to be statistically significant .

### Charts and Graphs



### Conclusion

Immediate postoperative evaluation of nostril width symmetry is not a reliable value in the immediate postoperative outcome evaluation. There is a wide variation in the proportion of nostril width six months after surgery. Even though there was not a statistically significant proportional variation in the nostril width 6 months after surgery, the tendency of the nostril base to widen is clinically important. Additional studies analyzing more variables in larger cohorts of patients are recommended. Outcomes databases obtained at mission sites are a useful source of information to evaluate post-operative changes in cleft patients. Making additional incisions (creating long term scars) at the end of surgery to adjust nostril width it wouldn't make sense taking in consideration this study.

### References

<sup>1</sup> Bermudez, L; Carter, V; Magee, W; Sherman, R; Ayala, R. (2010), Surgical Outcomes Auditing Systems in Humanitarian Organizations. *World Journal of Surgery*, 34 (3) 403.